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APPICON 2012

The 58th Annual Conference of Physiologists and Pharmacologists of India

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ABSTRACTS
(Invited Lectures)
Invited Guest Lectures

Abstracts

ROLE OF MATERNAL MICRONUTRIENT DEFICIENCIES IN FOETAL ORIGINS OF ADULT DISEASES: SOME RECENT FINDINGS FROM ANIMAL MODELS

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Obesity, overweight and type 2 diabetes (T2DM) are problems of global importance which are of great relevance to India. Abundant epidemiological evidence implicates maternal undernutrition (widespread in India) in their aetiology. Indeed it is hypothesized that maternal undernutrition programs the foetus/neonate for increased adiposity which predisposes them to insulin resistance (IR) and T2DM in adulthood. Importance of maternal macronutrient but not of micronutrient (MN) deficiencies is well established in developmental programming. Considering the epidemic proportion of Diabetes among Indians in whom low birth weight and MN deficiencies continue to be rampant, we assessed the effects of maternal MN deficiency on body composition, IR and macronutrient metabolism in rat models. Regardless of the type of MN, maternal deficiency of a variety of MNs throughout their growth, pregnancy, lactation and thereafter in the offspring, modulated body composition of the offspring: increased body fat % (visceral fat), altered adipokine levels and fatty acid synthesis/transport which resulted in dyslipidemia. They reduced soft tissue (muscle) mass as suggested by decreased % of lean body and fat free mass (supported by decreased myogenesis) and also modulated glucose uptake by muscle, an insulin responsive tissue. The offspring had altered glucose tolerance and insulin sensitivity perhaps due to altered insulin expression and/or secretion. Altered oxidative/corticosteroid stress appeared to be associated with the similar phenotypic changes observed in the offspring born to different MN restricted rat dams. Interestingly, maternal vitamin restriction induced changes appeared to be preventable/reversible by rehabilitation, while only changes in the associated biochemical/molecular mechanism(s) (but not the changes in the phenotype) induced by maternal mineral restriction were reversible, albeit partly. It was of further interest that maternal folate and/or vit B12 restriction induced changes in F1 offspring were also observed in F2 generation. These changes, which essentially are adaptations to overcome adverse conditions in utero/early postnatal life, appear to become maladaptive subsequently and set the stage for obesity, IR and type 2 diabetes in their later life.

NUTRIGENOMICS: IMPACT ON GLOBAL HEALTH DISPARITIES

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Knowledge of the human genome sequence combined with the ability to design evidence-based therapeutic nutrition creates an unprecedented opportunity to promote global health and wellness for vulnerable populations around the world. By matching
diet according to naturally occurring human genetic variation, researchers, educators, and policy makers see nutrition as an affordable, scalable, and culturally-appropriate means for preventing, mitigating, or treating communicable and non-communicable disease. Although a small number of single nucleotide polymorphisms (SNPs) have been shown to be causal for certain human diseases, many SNPs are weakly or strongly associated with diseases like type 2 diabetes (T2DM) and cardiovascular disease (CVD). Not surprising, diseases associated SNPs are not distributed randomly in the human population but rather cluster by race, ethnicity, and geography. For example, a recent meta-analysis of 100,000 individuals revealed nearly 100 previously unidentified SNPs associated with dyslipidemia and CVD. These new SNPs were most frequent in the genomes of South Asian, Chinese, and African American populations. What are the implications of these findings for populations in low-income and developing countries where standards of living are improving and calories (energy) per day are increasing? Have global efforts to address under-nutrition and malabsorption in the developing world, overlooked the long-term effects of increased caloric intake on late-stage chronic diseases like as CVD and T2DM (the “under-over nutrition paradox”)? Can we optimize current nutritional interventions to mitigate these secondary consequences of malnutrition on a region-specific and population-specific basis? For the past 10 years, the Center of Excellence in Nutritional Genomics (CENG) has been dedicated to translating the fruits of genomic, nutrition, and biomedical research to improve the health and well-being of women, children, the poor and underserved around the world. As food and life-style choice change rapidly and globally, how the CENG is prepared to meet these new challenges with knowledge, technologies and best practices that are affordable, sustainable, and culturally appropriate will be discussed.

VITAMIN B12 DEFICIENCY: CAUSES AND EFFECTS
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Vitamin B12 (Cobalamin, Cbl) is an essential micronutrient synthesized by microorganisms that acts as cofactors for two enzymes viz. methionine synthase (methyl Cbl) and methyl malonyl-CoA mutase (Ado-Cbl). In humans, vitamin B12 is obtained from food source or is synthesized by microorganisms in the gut. Mammals have evolved pathways for absorption, transport and cellular uptake of this vitamin which are carried out by three different proteins - haptocorrin (HC), intrinsic factor (IF) and Transcobalamin II (TCII). About 80% of cobalamin present in plasma binds to hepatocorrin and rest 20% to transcobalamin. Only the cobalamin bound to TCII is available for cellular uptake and is assimilated in the cells. Deficiency of this vitamin is associated with several disease conditions like megaloblastic anemia, impaired immune defence, gastrointestinal and neurological disorders. Recently we have shown the association of low B12 levels with coronary artery disease in Indian population. Vitamin B12 deficiency may result due to low intake (especially in individuals adhering to a strict vegetarian diet) or defects in absorption, transport or cellular uptake of the micronutrient. Several reports including ours have clearly shown that a large proportion of Indian population have low levels of vitamin
B12 which can be attributed to the consumption of strict vegetarian diet. Apart from diet, several single nucleotide polymorphisms (SNPs) have also been reported to be associated with levels of vitamin B12. Recent genome wide associations studies have identified several common single nucleotide polymorphisms (SNP) in fucosyl transferase 2 (FUT2) gene to be associated with levels of vitamin B12- the strongest association with a non-synonymous SNP rs602662. We have now replicated the association of this SNP in Indian population. We have also shown that SNPs in transcobalamin are associated with holo-transcobalamin levels which are considered to be the biologically active fraction of vitamin B12. We have also undertaken a genome wide association study to identify the polymorphisms associated with vitamin B12 levels in a genomic scale and have completed the first phase of the study and have identified several polymorphisms to be associated with vitamin B12 and holotranscoalamin levels in Indian population. We are currently validating the association in the second phase of the study. In an attempt to understand the effects of vitamin B12 deficiency we have developed vitamin B12 deficient rats in collaboration with National Institute of Nutrition and CSIR-Center for Cellular and Molecular Biology, Hyderabad. We evaluated the changes in protein expression in the liver of rats born to mothers fed with vitamin B12 restricted diet to understand the pathways affected due to maternal vitamin B12 deficiency. In the Liver samples from 12 months old offspring we identified 39 differentially expressed protein spots between control and maternal vitamin B12 deficient groups, 26 of which were restored to control levels after rehabilitation. These proteins were found to be involved in metabolism of amino acids, lipid and fatty acid oxidation. Downstream evaluation of fatty acid oxidation pathway revealed the differential role of a master regulator PPAR alpha and gamma in altered liver metabolism. Further, age dependent expression of PPAR in the liver of maternal vitamin B12 deficient pup indicated the presence of an intricate balance between catabolic and anabolic processes.

NUTRITION AT HIGH ALTITUDE
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The last decade has seen an impressive increase in tourism to high altitude areas. The hypoxic environment, low ambient temperatures, travel-related fatigue and poor logistics can often compromise nutritional intake at high altitude. Added to this are inappropriate thirst and appetite responses, increased insensible water loss, transient diuresis and increased energy expenditures. The combined effect of all the above can lead to rapid dehydration, glycogen depletion and weight loss if adequate food and fluid are neglected. Dehydration may intensify the symptoms of altitude sickness and result in even lower food intakes, thus setting off a vicious cycle.

Acute ascent to high altitude often leads to reduced food intake and any physical work can worsen the situation. The Operation Everest II simulation studies showed that despite providing subjects with a thermo-neutral environment and adequate availability of food and water, food intake remained lower than at sea level. This suggested that hypoxia by itself was a major
factor responsible for the reduced appetite and thirst in subjects.

There has been a keen interest in identifying the mechanisms responsible for the above observations as well as understanding the alterations in metabolic responses of the human body at high altitude. One such area of work has focussed on alterations on substrate utilization by the human body at high altitude suggesting that carbohydrates might be the preferred substrate at high altitude. Other studies have examined specific nutrient and micronutrient requirements at high altitude, especially with the knowledge that the body would experience an erythropoietic response to the hypoxic environment. Does this imply that all travellers and residents at high altitude require iron and vitamin supplementation? How much fluid should individuals consume at high altitude and does this have any bearing on the occurrence of high altitude pulmonary edema? This paper explores some such intriguing aspects of nutritional requirements at high altitude.

NUTRITION IN HEALTH, DISEASE AND THE MISSING LINK
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"Nutrition" is a fundamental function on which the condition of the body, a healthy state depends. A primary purpose of nutrition is, to establish and to sustain the structure and function of all organs and parts of the body. Nutrition therefore becomes a key factor for good health, and an important component of lifestyle management. Eating, the basic requirement for optimum health stands to change- for a better and healthier nation.

Drugs and doctors may be the third leading cause of death in the US as studied by the public health department of John Hopkins University. The scenario in developing India is more or less the same. Medical costs are rising, and despite advances in life-saving technology, we continue to suffer from unprecedented levels of disease. Drugs, Pesticides, fertilizers, chemical waste, and genetically modified foods have burdened us, and we suffer from low immunity, weak digestion, overweight, fatigue and the like. Millions suffer from painful crippling diseases because they violate the basic health principles; good nutrition and a disciplined lifestyle.

All these years, the modern westernized knowledge of nutrition has been focussing on the fundamental relations of energy-yielding constituents of food to vital activities. But it is only within recent years that the equally important relations of certain food-essentials—notably, mineral elements and vitamins- to the functional efficiency of the mechanisms of body have received their due attention.

Study of these relations has led to a new conception of causes and origins of disease: a concept which may be summed up in sequence- faulty food, faulty nutrition, faulty function, faulty health and finally disease. It is with this newer knowledge of nutrition, and not with just the energy requirements of the body, that we are concerned today.

Why look at bygone centuries when we have recent examples in front of us. Most of Our grandparents have healthily and happily completed almost a century in front of our eyes, following the basic principles of time tested traditional nutrition. For them, the evidence based medicine was the ageold time tested dos and donts of eating. We all have to
age, but to live a healthy and a fruitful life, let’s take a holy dip into deep traditions to new frontiers in nutritional awareness.

WHO says, "secondary prevention through diet & physical activity is a complementary strategy in retarding the progression of existing chronic diseases and decreasing mortality"...up to 80% of cases of coronary heart disease...up to 90% of cases of type 2 diabetes...about 1/3rd of cancers....could be avoided by eating healthily, maintaining normal weight and exercising throughout life. Truly speaking inspite of this much knowledge, do we really care to give specific dietary advice to our patients? As surgeons and physicians, we very well know that Resistance to infection may be greatly hampered by a deficient diet. Eg.Vitamin A or of vitamin C, also poor nutrition & metabolic diseases. The problem lies in our lack of comprehensive understanding of nutrition and the importance given to medical nutrition therapy

Have we ever thought, is there an ideal diet fit for everyone, for every geographical, climatic, racial outfit? No it has to be tailor designed as emphasized in our ancient scriptures

As a physiologist, I feel proud to present in front of you the knowledge which is lost in the dust of times.

And what is that?? An ancient holistic science, which offers a logical approach for determining correct diet based upon an individual’s constitution, also a diet which can bring balance to a disturbed body constitution.

Nutritional Indications & contraindications for each seasons are also mentioned in ayurveda and is rightly called ritucharya, the dosh-ritu diet connection, diet and the ritu sandhi, including the time tested saying that what we eat and drink significantly, though subliminally, affects our subtle and astral bodies as well. Some basic concepts of wrong food combinations should also be considered by our fraternity, while dealing with subjects for research as well as treating patients.

PREVALENT IYCF PRACTICES & IMPACT OF NUTRITIONAL REHABILITATION IN HOSPITALIZED MALNOURISHED CHILDREN

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Objectives: To study the currently prevalent Infant and young child feeding practices and the impact of nutritional rehabilitation using energy dense local foods on malnourished hospitalised children.

Design: Intervential study
Setting: Hospital Setting

Methods: One hundred and eighty hospitalised children in the age group 6-60 months formed the study material. Their prevalent feeding practices, nutritional status, morbidity details were recorded on a predesigned, pretested, semi structured questionnaire. PEM cases of grade III & IV (125/180 cases) were divided into three groups - Group A received only family diet, Group B received family diet + RUTF and Group C received Family diet + RUTF + multivitamin. The cases were of these three groups were followed up for two months monitoring their weight, height, MUAC, haemoglobin and S._albumin.

Results: Prevalent IYCF practices observed were - breastfeeding was initiated within 1 hour of birth in 60/180 (33.3%) cases, prelacteal feeding were being administered
by 110/180 (61.6%) mothers, exclusive breastfeeding was practiced by 30/180 (16.6%) mothers. 71/180 (39.4%) of mothers started complementary feeding at the recommended time i.e., at 6 month of age. IYCF index had inverse correlation with the morbidities (Fever, ARI, Diarrhoea, Pallor, Vitamin deficiencies.) and Z scores (HAZ, WAZ, WHZ scores). Nutritional rehabilitation results were better in Group B & C c.f A and difference was statistically significant p value (<0.001).

**Conclusion:** Prevalent IYCF practices are far from optimum and are primarily responsible for the increased morbidity in the hospitalized children. RUTF from the locally available foods are cheap and effective in combating malnutrition effectively, addition of multivitamins etc is hardly of any benefit. There is need to educate the caretakers and health care professionals for these optimum IYCF practices.

**SYMPOSIA 1: MANUSCRIPT WRITING AND REVIEWING**

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   *Purpose of the Symposia and General Principles of Manuscript Preparation*

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   *Process of peer reviewing and guidelines for reviewers*

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   *How to revise a manuscript after obtaining the reviewers comments*

4. **Prof S B Deshpande,** Professor, Deppt of Physiology, IMS, BHU, Varanasi  
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   *Ethical issues of Publication*

Publishing the results of research activity in recognized, peer-reviewed scientific journals is essential both to scientific progress and to the advancement of professional career of the individuals. Indeed this is a part of social responsibility because public resources are utilized in the conduct of the research. The process of publication requires preparation and submission of manuscript by authors to the journal, evaluation of the manuscript by set of reviewers appointed by the editorial board of the journal, repeated anonymous communication between authors and reviewer through journal staff till a decision is reached. Decision to publish or not to publish is finally taken by the editorial board on basis of recommendation of the reviewer and the scope of journal and other factors such as plagiarism, conflict of interest etc. While rejecting a ‘good’ manuscript will lead to disappointment to authors, accepting a ‘flawed’ manuscript has larger disservice is done to community and progress of science. Although readers must be judge the quality of manuscript, goodness of peer-review system instills the faith regarding the reliability and quality of the article published. There is no perfect way to ensure that manuscript gets published, but a poorly written manuscript is surest way to ensure that it won’t get published despite being good on scientific content. Manuscripts are written after the experiments have been performed and results have been obtained. Writing a good manuscript takes sincere effort and at the end effort is worth it. The editors have the serious responsibility of upholding the values and scientific veracity of
the contents. Collective activity of reviewers is critical to maintain the standard of the journal and the research field. Reviewers are a key to the whole process, since they will make a judgment call. They are required to demonstrate the highest standard of probity and integrity that is applicable to a judge in the legal system. They are neither the agents of the journal nor the friends of the authors. Evaluating a manuscript is time consuming, intellectually challenging and effort intensive commitment. While there is no perfect method of evaluating, certain guidelines do help. Methods of reporting need to actionable, so that authors can make necessary changes in the manuscript. The authors must have faith that comments that have been by the reviewer are intended to improve the manuscript from scientific as well as editorial angle. An excellent manuscript is more likely to be quoted in the future publications. They must respond to the queries raised by reviewers in systematic manner. Improper responses either results in delay of publication or worse rejection.

In an era where high weightage is being accorded to publications for career advancement, there is a human tendency to risk the ethical and moral issues for material return. All the stake holders, the researchers, authors, members of the editorial board and reviewer must collectively maintain the moral fabric that holds the science together. In the symposia, all the above issues will be brought out in open to encourage community participation in the process. The issues will be deliberated and noted as a consensus of the members of APPI.

**SYMPOSIUM 2: PHYSIOLOGICAL FUNCTION IN STRESSFUL CONDITIONS: A MILITARY PERSPECTIVE**

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_Sleep Deprivation Induced Cognitive Decline Is Improved By Psycho-Stimulant Drugs_

2. **Dr. G. Bhaumik**, DIPAS

_Rapid acclimatization to High Altitude by intermittent Hypoxia at sea level_

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3. **Dr. R. K. Gupta**, DIPAS

_Predicting High Altitude Pulmonary Edema (HAPE) Susceptibility at sea level._

4. **Dr. Abhishek Bhardwaj**, DIPAS

_Heat Stress Effects on Hematological Parameters During Graded Physical Work In Desert_

_Sleep Deprivation Induced Cognitive Decline Is Improved By Psycho-Stimulant Drugs_

**Objective:** Sleep deprivation (SD) is a growing problem of urban life which affects various categories of people like call centre workers, medical and ancillary workers, truck drivers, other shift workers as well as armed forces personnel. SD impairs cognitive functions like attention, vigilance, concentration and working memory. Two psycho-stimulant drugs caffeine and modafinil were evaluated as countermeasures in the reduction of cognitive decline during SD in human volunteers and the mechanisms of action were studied in an animal model.

**Methods:** Normal, healthy males, 25-30 yrs participated in the study. The subjective sleepiness scales, Event Related Potential (ERP) P300, Contingent negative Variation (CNV) and Heart rate variability (HRV) were
recorded. The experiment was performed in 3 sessions. 1. Baseline, 2. After 1 night of total sleep deprivation and 3. following 1 night sleep deprivation along with interventions: caffeine and modafinil, 400 mg/d each in separate studies. Working memory using delayed alternation task, regional brain norepinephrine, dopamine, serotonin, GABA, adenosine and enzymes tyrosine hydroxylase, tryptophan hydroxylase and glutamic acid decarboxylase levels in frontal cortex, brainstem and hippocampus of rat were estimated by HPLC and IHC baseline, after sleep deprivation and after sleep deprivation with modafinil (100mg/kg/day).

**Results:** In human volunteers, SD increased subjective sleepiness scores, N100 and P300 peak latencies of ERP and CNV M100 and P300 peak latencies and reaction time and HRV LF/HF ratio after SD (p < 0.01). These changes were ameliorated by caffeine and modafinil (p < 0.05).

Working memory using delayed alternation task, regional brain norepinephrine, dopamine, serotonin, GABA, adenosine and enzymes tyrosine hydroxylase, tryptophan hydroxylase and glutamic acid decarboxylase levels in frontal cortex, brainstem and hippocampus of rat were altered by SD modafinil significantly modulated the levels.

**Conclusion:** Caffeine and modafinil improved subjective sleepiness and cognitive decline during SD probably by modulation of regional brain monoamines, adenosine and GABA and the enzymes involved their biosynthesis.

**Keywords:** Modafinil- caffeine -sleep deprivation- cognition-ERP-brain monoamine

**Rapid Acclimatization to High Altitude by Intermittent Hypoxia at Sea level**

Rapid deployment of military personnel into high altitude frequently occurs in emergencies/war like conditions. Rapid deployment of unacclimatized soldiers to high mountainous environments may cause debilitating effects on operational capabilities and troop’s health (i.e; decrease in physical work capacity and development of acute mountain sickness, AMS). Most of the altitude induced debilitations can be prevented by altitude acclimatization and considered to be the best strategy for the prevention of AMS and allow to achieve the maximal physical work performance. Acclimatization is elevation specific and full acclimatization at particular altitude refers the partial acclimatization to next higher altitude. However, the degree of acclimatization depends on the individual’s physiological responses and the magnitude of hypoxic exposure. Acclimatization to a particular altitude can be induced by slow ascent or continuous sojourns at intermediate altitude. However due to emergencies like scenario military personnel may not get sufficient time for staged acclimatization and they are forced to induct at high/ extreme altitude within a short period of time. A more recent approach to induce altitude acclimatization at sea level is use of daily intermittent hypoxic exposure (IHE) in lieu of continuous residence at high altitudes. IHE is a method to simulate the altitude exposure/training at the sea level itself. It involves breathing oxygen reduced air periodically for the purpose to improve physical work performance and pre-acclimatization to altitude. IHE protocol consists of three basic elements i.e, 1) IHE simulated altitude (PIO2: partial pressure of oxygen), 2) IHE session duration, and 3) total number of IHE session over the treatment protocol. The benefit of IHE is similar to those gained from conventional altitude
training and is a potent means of pre-conditioning of an unacclimatized soldier at sea level itself. In IHE, there is a temporary decrease in oxygen availability in the blood which triggers the onset of physiological process to enhance the efficiency of the cardiovascular, respiratory and oxygen utilization systems. The predominate IHE induced altitude acclimatization response appears to increase arterial oxygen content through ventilatory acclimatization process. IHE is a promising approach to provide the benefits of altitude acclimatization to low-altitude based soldiers before their deployment to high mountainous region.

Key words: High altitude, acclimatization, mountain sickness, intermittent hypoxia

**Susceptibility To High Altitude Pulmonary Edema**

*Background:* HAPE is a form of noncardiogenic pulmonary edema that develops in approximately 10% of randomly selected mountaineers within 24 hours after rapid ascent to altitude above 4000 m. Past studies have shown ambiguity in terms of HAPE susceptibility and low lung volumes. It has been hypothesized that there is some constitutional abnormality in HAPE susceptible (individual having prior history of HAPE) who remain asymptomatic at lower altitude but become symptomatic under hypoxic stress. Therefore, present study was designed to investigate the correlation of baseline pulmonary function with the hemodynamic responses under normoxia and acute hypoxia in HAPE susceptible and control subjects.

*Methods:* Functional residual capacity (FRC) and Carbon monoxide diffusion capacity (DLCO) was done in 4 control subjects (no prior history of HAPE) and 8 HAPE susceptible subjects. Hemodynamics of both groups were compared before and during normobbaric hypoxia (Fio2= 0.12) after 30 min. and correlated with their pulmonary functions.

*Results:* Control subjects showed a significantly high FRC and DLCO compared to HAPE susceptible subjects. HAPE susceptible subjects showed a significantly high mean blood pressure and low peripheral oxygen saturation under normoxia and hypoxia condition compared to control subjects. A significant positive correlation was found between DLCO and peripheral oxygen saturation during normoxia and hypoxia. A significant negative correlation was found between FRC and mean blood pressure during hypoxia.

*Conclusions:* It may be concluded that HAPE susceptible subjects have constitutional pulmonary abnormality, which can be screened by baseline pulmonary function and evaluated at low altitude by monitoring pulmonary and systemic hemodynamic responses during normoxia and hypoxic stress.

**Heat Stress Effects On Hematological Parameters During Graded Physical Work In Desert**

*Introduction:* Strenuous activity under extensive environmental stress lead to changes in body fluids and hematological parameters. Present study was carried out to document the effects of extreme heat exposure (WBGT Index 36.24°C) on hematological variables, while performing graded work (Sedentary, Moderate and
Heavy work). These finding may be beneficial to devise strategies for identifying hypo-hydration status much before their symptomatic expression while working in desert conditions.

Methods: Forty (n=40) physiologically and psychologically sound volunteers were selected randomly without bias. They were of mean age 24 (±3.8) years, height 171 (±4.5) cm, weight 63.5 (±6.6) kg and BSA 1.73 (±0.09) m². The volunteers were divided into groups (Sedentary, Moderate and Heavy) depending on energy expenditure while carrying out physical work under extreme heat exposure in desert of Rajasthan (WBGT Index 36.24°C). Hematological variables were assayed from volunteers while performing graded physical activity.

Results: White Blood Corpuscles (WBC) count and Haematocrit % (Hct %) only among heavy work group [506 kcal/hr energy expenditure] showed significant increase from pre to post exposure (p < 0.01). Red Blood Corpuscles (RBC) count and Red Blood Cell Distribution Width (RDW) had no significant increase. Blood viscosity showed significant increase among moderate work group [412 kcal/hr energy expenditure] (p<0.05) and heavy work group (p<0.001).

Conclusion: These data indicate that volunteers performing heavy work show significant hypo-hydration (4% of body weight). This depletion of body fluid got reflected on blood viscosity and WBC count at a stage when hypo-hydration was not subjectively perceived. Data may be beneficial to identify such hypo-hydration status before the condition is manifested visibly or symptomatically.

SYMPOSIA 3: CHALLENGES FOR PHYSIOLOGY AND PHARMACOLOGY TEACHING IN UPCOMING MBBS CURRICULUM

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The curricular changes are an evolutionary step and being done at regular intervals. The basic sciences teaching has been revised earlier also when first professional duration was changed. The relevance of basic science teaching to the clinical sciences teaching has been the focus of discussion in all curricular changes. In our country, we are having a revision of curriculum which talks of early clinical exposure, some basic foundation topics, integrated teaching and changes in duration of professionals and even changes in assessment. Hence, this symposium will introduce the participants to the upcoming proposed revised curriculum for MBBS and challenges in implementing this especially in concern with teaching in physiology and pharmacology. The proposed components such as foundation course, early clinical exposure, integrated teaching and clinical skill enhancement will be discussed. The role
of various stakeholders i.e. administrators, faculty and students will be discussed. The proposed changes in physiology and pharmacology will be brought out along with challenges in implementation. The need and relevance for enhancing skills of faculty in view of the upcoming challenges will be highlighted. The various avenues for training/faculty development programs for faculty will be shared. The symposium will also have brainstorming about the effective use of assessment strategies in the curriculum. The assessment methods and their use in formative activities will be discussed.

SYMPOSIA 4: CLINICAL TRIALS AND CLINICAL PHARMACOLOGY

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   Planning of Clinical Trial

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   Conduct of trial

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   *Ethical & Legal Issues for conduct of clinical trials*

**Planning of Clinical Trial**

In this presentation, we will briefly discuss the process of new drug development – particularly the clinical phase of new drug development. Briefly discussed below are Phase 1, 2 and 3 trials – their aims, methods and requirements. In addition, the current issues in clinical trials will be taken up in the presentation. Some of these are: recent news regarding controversies about recent deaths in clinical trials in India; publication bias, clinical trial registry, and ethics committees.

The Indian Pharmaceutical industry is worth about Rs. 90,000 Crore. It is growing at the rate of 12 – 14% per annum. We are also exporting a large number of drugs and the exports are growing at 25% Compound Annual Growth Rate (CAGR) per annum. India exports about Rs. 40,000 Crore of Pharma products each year so much so that India is seen as the ‘Global pharmacy of Generic Drugs’. India provides good quality generic drugs at affordable cost to many African countries and has been instrumental in curtailing HIV epidemic in Africa. India has also emerged as a hub of Global Clinical trials and is also becoming R&D destination in the field of Drug Discovery & Development. As per the CDSCO website, the total number of applications received in the DCGI office have more than doubled from approximately 10,000 in 2005 to 22,806 in 2009.

The process of clinical drug development basically involves three stages – Phase 1, Phase 2 and Phase 3. Several clinical trials are conducted in each of the phases and a brief description is given below.

Phase 1 clinical trials are usually done in healthy volunteers with the major aim of finding out about the toxicity of the new drug, the maximum tolerated dose (MTD), the pharmacokinetic (PK) profile, and, when possible, the pharmacodynamics (PD) of the new drug. These trials are conducted in specialized units called Clinical Pharmacology Units (CPU) by specialized investigators called Clinical Pharmacologists. The first-in-
human study is a single ascending dose study (SAD), in which a single dose of the new chemical entity (NCE) is administered and the subjects monitored, blood samples are taken for PK analysis, biochemical and hematological parameter assessments. The usual design is 6+2, in which a set of 6 volunteers is given the NCE and 2 are given placebo. Once this first dose is found safe, the next cohort of 8 volunteers is taken and a higher dose administered. This is continued until a dose is detected at which an adverse event occurs that is considered to be dose limiting and no further dose escalations are done. Multiple ascending dose (MAD) and food effect studies are then conducted.

Once we know about the common adverse effects of the NCE and the MTD, phase 2 studies in patients with target disease are planned. Initial phase 2 trials may be uncontrolled but later on placebo- or active-controlled trials are performed. The most common design is parallel but other designs like cross-over can also be used. Phase 2 trials are usually conducted in small numbers of patients (few hundreds) with stable disease, without concomitant disorders and using several doses. The endpoints in these trials are surrogate endpoints and not hard endpoints. These aims of these trials are to find out: if the NCE is effective, safe, what is the best dose, and PK/PD in patients. These studies are important because the sponsor has to take a “go-no go” decision based on them, i.e. whether to take the NCE forward or not.

If the drug is found safe and well-tolerated in phase 2, large-scale phase 3 trials are conducted. The US FDA wants data from 2 large phase 3 trials before giving approval for marketing. Phase 3 trials can be placebo- or active-controlled and are multicentric and often multinational. The dose found most suitable in phase 2 is used, the inclusion-exclusion criteria are less stringent as compared to phase 2 and patients with concomitant disorders may be included. Phase 3 trials form the most important component of the New Drug Application (NDA) that the sponsor files with the regulatory authorities. And based on these trials, the sponsor is given approval to market the drug. Phase 3 trials are expensive, costing hundreds of millions of dollars and thousands of patients are enrolled.

Since these trials can be done in India at much less cost and because of the large numbers of patients with virtually all the diseases are present in India, our country has become an important destination for phase 2 and 3 trials. Since the resources, budget and manpower available with the regulatory authorities in India are much smaller as compared to the western countries, particularly the US FDA, the possibilities of irregularities in the conduct of these trials may be higher. These challenges will be discussed in the presentation.

The second issue that will be discussed in the presentation is that of publication bias, which occurs when the sponsors fail to publish trials that had shown negative results. How this impacts the practice of evidence-based medicine (EBM) will also be discussed. Whether clinical trial registry can change this practice will be discussed as well.

The last issue that will be taken up regarding clinical trials is that of Ethics Committees, their current scenario, challenges being faced and possible solutions.

**Pharmacokinetics Made Easy**

Pharmacokinetics is defined as what the body does to the drug. It consists of three processes namely: absorption, distribution
and elimination. The process of elimination encompasses metabolism and excretion. These processes provide a mathematical basis to assess the time course of drugs and their effects in the body. There are two order of processes namely zero-order and first-order reaction. Some drugs at higher concentration (in case of overdose) follow zero-order reaction, followed by first-order reaction. The drugs then get distributed in the body, enabling the drug to reach its site of action and start of metabolism and excretion. Clearance is defined as the volume of plasma cleared of drug per unit time. Half life is defined as the time in which drug concentration fall by half. Apparent volume of distribution is the volume in which the drug appears to be dissolved. The plateau principle shall be discussed. Use of excel worksheet to calculate these parameters from real time examples will be demonstrated. Real life situations considering the impact of plasma protein binding on dose calculations shall be discussed.

Conduct of trial
Clinical trials need to be conducted as per good clinical practice (GCP) norm. Carrying them out, thus, requires a great deal of management and planning. Though protocol for the clinical trial is the guiding document for formulating the plan, several other systems need to be set in place. These are related to maintenance of trial related documents, supply and maintenance of trial related drugs and or other materials, acquisition, recording and transfer of data. Time lines and resources have to be outlined in advance. Adherence to regulations governing a particular trial is important as is adherence to the protocol. Key to the conduct of clinical trials as per GCP is an efficient internal and external monitoring system. Liaisons with contract research organizations are important for large sponsor initiated multicentric trials. On the lines of CROs many academic institutes have taken up the task of building up such systems, the academic research organizations, within their framework.

Ethical & Legal Issues for conduct of clinical trials
Ethical & issues and registration of ethics committees (Amendment Drugs & Cosmetic Rules 1945) as well as registration of clinical trials will be discussed (CTRI). Ministry of Health & Family Welfare has in consultation with Drugs Technical Advisory Board, taken a significant decision to make registration of Ethics Committee mandatory for clinical trials in the country. The decision came in the wake of widespread complaints that the Ethics Committees at most of the clinical trial sites are not independent and also not active with no monitoring of trials. It is this situation that led to a steep rise in trial related deaths and injuries in the country during the last five years.

In the past Ethics Committees were constituted to conduct trials but they were not registered and there was no periodic meetings with investigators, no critical assessment of data done, and there was no monitoring of the functioning of the Ethics Committee by the office of DCGI. With the 4th amendment to Drugs & Cosmetic Rules 1945, clause (b) of rule 21, now, for starting any clinical trial, an Ethics Committee needs to be registered, without which the DCGI does not permit the trials in the country.

The notification further says that an application for registration of ethics committee shall be made to the licensing authority in accordance with the requirements prescribed under Schedule Y-I.
The licensing authority after being satisfied that the requirements of the rules having been complied with may grant registration subject to the condition stated therein. The registration of the ethics committee is valid for a period of five years from the date of issue. Proper functioning of ethics committees and their periodic monitoring is extremely urgent considering the growing number of clinical trials taking place in the country.

**SYMPOSIA 5: SPINAL CORD TRANSMISSION AND SPINAL INJURY**

1. **Dr J N Singh**, Dept of Pharmacology & Toxicology, NIPER, Mohali  
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   *Hyperglycemia mediated Ion Channel Changes In Dorsal Root Ganglion Neurons*

2. **Dr. Rashmi Mathur**, Prof & Head, Deptt of Physiology, AIIMS, New Delhi  
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   *Intraoperative monitoring of the spinal cord during the course of surgery*

4. **Dr. J. Manjhi**, Assistant Professor, Centre for Biomedical Engineering, Shobhit University, Meerut  
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   *Effect of complete thoracic SCI on the sub-lesion bones in rats.*

5. **Dr S B Deshpande**, Professor, Deptt of Physiology, IMS, BHU, Varanasi  
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   *Nitrergic Transmission In The Spinal Cord*

**Hyperglycemia mediated Ion Channel Changes In Dorsal Root Ganglion Neurons.**

**Objective:** Glucose uptake in neurons depends on glucose concentration around the cell. High concentration of extra-cellular glucose, if persist for long time may cause cellular damage by altering the Na+ channels. Hyperglycemia is known to produce neuropathic pain in long term diabetic patient. Yet, the mechanism involve for neuropathic pain in diabetes are poorly understood. In these diabetes models, hyperglycemia brings about multiple biochemical changes translate into abnormally increased excitability of primary sensory neurons and neuropathic pain, where voltage-gated sodium channels are mainly involved. Thus, it is necessary to examine how sodium channels contribute to sensory disturbances, especially hyperalgesia, one of the major symptoms of diabetic neuropathy.

**Method:** In this study, we have investigated the effects of extra-cellular glucose exposure on sodium channel kinetics in cultured dorsal root ganglion neurons from neonatal rats and sodium currents were recorded using whole cell patch clamp technique.

**Result:** Density of tetrodotoxin (TTX) resistant Na+ currents was increased after 4 hrs of high glucose (60mM) exposure compared to control. However, density of TTX-resistant currents were increased significantly both with 45mM and 60mM of glucose exposure for 24 hrs as compared to control. The conductance curve of TTX-resistant Na+ current shifted leftward after 24 hrs of 45mM glucose exposure. Carbamazepine (CBZ, 100µM) depressed TTX-resistant Na+ current in neurons incubated with 17.26, 45 and 60 mM of glucose. The depression observed with CBZ in
control was significantly different from high glucose i.e., 45 mM.

**Conclusion:** These results suggest that a short-term exposure of high glucose concentration can directly enhance the Na+ channels activity, which was further attenuated by carbamazepine.

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**Effect Of Magnetic Field Exposure On Peripheral And Central Effects Of Complete Spinal Cord Injury.**

**Objectives:** To study the effect of extremely low frequency-magnetic field (ELF-MF; 17.96 µT, 50 Hz, 2h/d) for 8 weeks on spinal and supra-spinal effects of complete spinal cord injury (SCI) at T11.

**Methods:** Adult male Wistar rats were divided into Sham, SCI and SCI+MF groups. The supra-spinal effects were studied by behavioural parameters such as simple vocalization, TSV; vocalization-after discharge, VAD; tonic (formalin) pain; and neurotransmitter concentration while the spinal effects by locomotion (BBB score), sensorimotor response to noxious thermal (tail flick latency, TFL; Hot plate lick latency, HPL) and electrical stimuli (threshold of tail flick, TTF) besides microscopic evaluation of SCI studied.

**Results:** BBB score improved (2.85±0.36 vs. 8.80 ±0.41); TFL decreased (hyperalgesia) in SCI group versus SCI+MF group. Formalin pain rating was 2.1±0.09 in Sham group which was lower in SCI (p=0.0001) and SCI+MF (p=0.004) groups although, the decrease was lesser (p=0.0001) in SCI+MF versus SCI group. The number of flinches during the late phase (15-60 min) decreased in SCI (p<0.001) and SCI+MF (p<0.01) versus Sham group although, it recovered partially (p<0.001) in the SCI+MF group. The concentration of serotonin decreased significantly post-SCI in cortex, brain stem and forebrain regions which was restored significantly in the SCI+MF group. Lesion volume was significantly reduced (p=0.006) in SCI+MF versus SCI group.

**Conclusion:** We conclude a beneficial effect of chronic exposure to ELF-MF on locomotion, tonic pain, neurotransmitter and histology in the SCI rats.

**Intraoperative monitoring of the spinal cord during the course of surgery**

**Objectives:** To study on intraoperative muscle motor evoked potentials (MMEPs) from lower-limb muscles in patients undergoing surgery for spinal cord tumors.

**Methods:** Of 115 consecutive patients undergoing surgery for spinal cord tumors, 110 were included in this study. Muscle MEPs were generated using transcranial electrical stimulation under controlled anesthesia and were recorded from the tibialis anterior, quadriceps, soleus, and external anal sphincter muscles bilaterally.

**Results.** The overall success rate for obtaining baseline lower-limb MMEPs was 68.2% (75 of 110 patients). Eighty-nine percent of patients with Nurick Grades 0–3 had successful MMEP recordings. Muscle MEPs could not be obtained in any patient in whom muscle power was 2/5 or less, but were obtained from 91.4% of patients with muscle power of
4/5 or more. Analysis showed that only preoperative Nurick grade (p ≤ 0.0001) and muscle power (p < 0.0001) were significant predictors of the likelihood of obtaining MMEPs. Responses were most consistently obtained from the tibialis anterior muscle (68%), but in the other 32% MMEPs could not be recorded from the tibialis anterior but could be recorded from another muscle. The ability to monitor MMEPs was associated with better motor outcome at discharge from the hospital (p = 0.052).

Conclusions: The likelihood of obtaining lower-limb MMEPs is significantly greater in patients with better functional grades and higher motor power. Muscle MEPs are most consistently obtained from the tibialis anterior muscle but other muscles should also be monitored to optimize the chances of obtaining MMEP responses from the lower limbs.

Nitric Transmission In The Spinal Cord

Objectives: Nitric oxide (NO) is one of the transmitter and modulator at vascular smooth muscle. Recently, transmitter/modulator role of NO in the central nervous system has been reported. The role of NO in spinal synaptic transmission has been examined to understand the modulation of various neurotransmitters.

Methods: The in vitro spinal cord preparation from the neonatal rat spinal (5-7 d old) was used. The spinal cords were sagitally hemisected and dorsal evoked ventral root potentials were recorded. According to the latency, monosynaptic (MSR) and polysynaptic (PSR) reflex potentials can be recorded in the corresponding segmental ventral root. Using various agonists and antagonists the NO transmission was examined. Also nitrite was estimated from the spinal cords.

Results: Superfusion of 3-nitropropionic acid (3-NPA) or scorpion (Mesobuthus tamulus; BT) venom depressed the MSR and PSR in a concentration and a time dependent manner. 3-NPA- or BT-venom induced depression of reflexes was blocked by nitric oxide synthase inhibitor (L-NAME) and the depression was absent in the presence of hemoglobin (NO quencher). Further, G-cyclase inhibitor, methylene blue blocked the 3-NPA-or BT venom-induced depression of spinal reflexes. The nitrite (indicator of NO) content was increased in spinal cords exposed to 3-NPA and the increase was absent in L-NAME pretreated cords. However no such changes were seen in BT venom treated cords. The 3-NPA or BT venom-induced depression involves GABAergic and glycineergic transmission.

Conclusions: Thus, No generated by 3-NPA or BT venom depress the spinal reflexes. The NO modulates the GABA/glycine transmission to produce synaptic depression in the spinal cord (supported from the grants from ICMR and CSIR)

SYMPOSIA 6: AUTONOMIC NERVOUS SYSTEM EVALUATION UNFOLDS NEW OPPORTUNITIES FOR CLINICAL DIAGNOSIS AND PROGNOSIS

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   Autonomic Nervous System- An Overview- From Synapse to Network

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Autonomic Nervous System- An Overview- From Synapse to Network
The Autonomic Nervous System which plays a critical role in controlling the involuntary functions has been less explored than the central nervous system in terms of cellular, synaptic and network level organization. My talk will dwell upon the unique features of autonomic neurons, their connectivity through unconventional synapses and how this network mediates complex behaviour. Examples from animal as well as human studies will be provided to illustrate the mysticism which characterizes Autonomic Nervous System.

The rest of the talks in this session will focus on autonomic nervous system impairment in extreme environmental conditions and also on the diagnostic and prognostic utility of evaluation of Autonomic Nervous System functions in specific disorders.

Autonomic Responses During Acclimatization To High Altitude

The autonomic nervous system, due to its afferent and efferent nervous influences on the regulation of visceral functions, is likely to play an important role in the process of acclimatization to high altitude (HA). As HA stress combines both hypoxia and cold, it is not well documented as to how these two stresses simultaneously modulate the autonomic responses. Earlier studies had reported changes in autonomic balance in soldiers, on return to sea level after a stay of 2 years at 4300 m. Their results indicated that some components favoured sympathetic hyperactivity and others favoured parasympathetic hyperactivity. A study has been conducted on 20 sojourners to evaluate responses of the autonomic nervous system during acclimatization to HA (3600 m) periodically for 3 weeks. A rise in heart rate, blood pressure, oral temperature and urinary catecholamines and a fall in skin temperature, cold pressure response and orthostatic tolerance were observed immediately on arrival at HA, indicating a relative hyperactivity of the sympathetic system. After a stay of 1 week, there was a gradual recovery in all the response, though sympathetic hyperactivity was still maintained throughout the 3 weeks of stay. It has been concluded that in lowlanders it takes more than a year of stay at altitude for complete recovery of autonomic balance.

There was a relative parasympathetic dominance in natives at HA showed a gradual decrease during their sojourn on the plains, probably due to the elevation in sympathetic activity. On return to high altitude, they showed further increase in sympathetic excitation, as observed in lowlanders on acute induction, but the magnitude of this response was less in natives.

To understand the ethnic variation in the autonomic acclimatization process a study...
was conducted in Indian and Kyrgyz soldiers. It was observed that in Indian subjects, there was a greater recovery of parasympathetic activity with acclimatization as compared to the Kyrgyz volunteers. In terms of autonomic reactivity on cardiovascular control, results indicated a decrease in parasympathetic reactivity and increase in sympathetic reactivity at HA. Parasympathetic reactivity as measured by E:I ratio during deep breathing, Valsalva ratio 30:15 ratio on orthostasis showed maximum decreases with 24 hrs of induction to HA and then small increase indicating partial recovery with sojourn. Similarly, increases in sympathetic reactivity at HA were maximum at around 24 hrs of sojourns with subsequent recovery.

**Hemodynamic Crisis Assessment by Evaluating Autonomic Nervous System: Prognostic Implications**

A large body of evidence favours clinical use of testing of autonomic nervous system (ANS). The clinical implications of autonomic tone quantification have been documented in two clinical entities: first, as a predictor of sudden cardiac death after myocardial infarction, and secondly, as a laboratory marker of evolving diabetic autonomic neuropathy. For over two decades their role in evaluation and management of several other chronic conditions has been recognized. Recently, the role of autonomic tone quantification through heart rate variability (HRV) in acute cardiovascular crisis has been investigated. It is emerging as an indicator of hemodynamic crisis. HRV is a potential tool to serve as predictor of hemodynamic crisis in operation theatres and emergency rooms. It also has capability to predict the severity of prognosis for recovery in children and adults in traumatic injury. Besides this, it can also serve as a tool for monitoring ANS during anesthesia. The integrity of autonomic nervous system plays a crucial role in maintaining blood pressure in compromised physiologic situations like anesthetic sedation. If there is problem with ANS, there is likelihood of having unprecedented fall in blood pressure during anesthesia. In one Japanese study the HRV was used to monitor ANS activity in a female patient of olivopontocerebellar atrophy during surgery. Depending on HRV values, the dose of ephedrine was used to increase the ANS tone. Thus, the episodes of hypotension during anesthesia in this patient with compromised ANS integrity was successfully treated by a minimal dose of ephedrine by using HRV as monitoring tool. Recently, we have conducted a study to find the association of autonomic status to the surgical outcome in patients of diabetes mellitus. Thus, the alterations in autonomic tone have been documented in several severe hemodynamic crises. There is a need to carry out systemic studies in anticipated and actual hemodynamic crisis conditions. It is our opinion that HRV may become as common as pulse and blood pressure in patient charts in the near future for monitoring regulatory controls of homonymous crisis.

**Autonomic Functions: Diagnostic implications in Neurological Disorders**

The term autonomic nervous system (ANS) was coined by Joseph Newton Langley. The ANS is an extensive neural network which helps in the maintenance of homeostatic functions of the human body. Clinical tests of the autonomic nervous system are broadly categorized into cardiovagal, adrenergic and sudomotor tests. These tests are evaluated together to compile the Composite Autonomic
Severity Scores (CASS) which enables a categorization of patients into normal and mild, moderate and severe Autonomic dysfunction. In addition the sub-head scores inform the specific pattern of autonomic dysfunction.

The heart rate variability (HRV) is a normal physiological phenomenon which depicts the variation in the normal R-R intervals during sinus rhythm. In recent times the development of analysis techniques for HRV in time and frequency domains has been extensive. HRV is able to provide a good reflection of the balance and adaptability of the autonomic nervous system. This has both diagnostic and prognostic value. Another important parameter in evaluation of AFT is Baroreflex sensitivity (BRS) which is assessed non-invasively by simultaneously measuring the beat to beat changes in RR interval and BP.

Interaction between autonomic nervous system and Immune system are seen in neurological diseases. Measurement of HRV in acute phase after traumatic brain injury (TBI) have shown increased High Frequency/Low Frequency ratio. This indicates the parasympathetic over activity during the acute phase. This might be due to increased intracranial pressure causing stimulation of higher brain stem vagal nuclei. This was same in an animal study done on cats & found that vagal activity increased with increase in intracranial pressure. Thus in TBI, the patients suffer from severe impairment of immune responses and they have augmented vagal activity & in turn have an inhibitory effect on innate immune response.

Alterations in autonomic function during ictus in patients with epilepsy are common. Sudden Death is more common in patients with epilepsy and autonomic dysfunction may be the cause of sudden death. Since there are no biological markers for impending seizures in epilepsy hence evaluation of autonomic functions are useful.

Autonomic Function Tests have importance in the diagnosis of: a) Progressive autonomic Neuropathy and its severity and pattern. e.g. Differentiating Parkinson’s disease from MSA and Shy-Drager syndrome. b) Differentiation of benign and life-threatening dysautonomia. c) Distal small fiber neuropathy. d) Sympathetic mediated pain syndromes e) Peripheral neuropathy differential diagnosis once demyelinating neuropathy is ruled out. f) Postural tachycardia syndrome.- The diagnosis of POTS requires the Head Up Tilt Test (HUT). A rise in Heart Rate by 30 or a Heart Rate greater than 120 bpm within 10 mins of commencement of HUT establishes the diagnosis. g) Differential diagnosis of syncope. h) Obtaining pattern of Lower Urinary Tract Dysfunction in CNS disorders. It guides the specific bladder management protocol. HRV has been used as an objective indicator of sympathetic activation during Uro Dynamic Studies. i) Diagnosis of CNS autonomic disorders. j) Correlation of peripheral autonomic findings with CNS activation and other CNS functions by combining modalities such as FMRI with AFT.

**PRE CONFERENCE CME**

**‘MEDICAL ETHICS’**

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**Abstract**
The role of Ethics becomes increasingly pertinent to present day healthcare and research in biomedical sciences, wherein one has to deal with rapid technological advancements on one side and newer treatment modalities and research avenues emerging as options for improving healthcare of individuals as well as the society on the other. I shall build up my story with a brief overview and basic principles of Bioethics (Ethics dealing with biomedical sciences and related issues) before moving on to focus on the topic at hand and it would be a good idea to view Ethics in terms of its relevance in specific contexts where right and wrong are considered, accounting for social, economic, cultural, religious, and ethnic diversity of the issue being considered.

**HOW TO PROMOTE RESEARCH CULTURE IN MEDICAL COLLEGES?**

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**Introduction:** Quality medical research is conducted at few medical colleges in India and the research which is happening has also not been able to significantly contribute for the advancement of medical science as compared to the contributions by other nations. The very reason for this scenario is most probably the lack of research culture amongst medical fraternity in India. Although, Medical Council of India (MCI), is emphasizing on research since few years now, the impact has not been as expected apart from the launch of new medical journals and increase in publication. This is most likely due to the fact that the training of medical graduates does not occur in a research culture as against the training occurring in countries like USA. It is therefore very essential to develop and provide a good research culture in a medical college so as to cultivate research aptitude amongst medical fraternity from the very beginning of their medical profession as medical undergraduates. We are concerned about developing research culture because we believe that research is the basis of how medical education works. Research should be the fundamental support of our teaching. In fact, research is the basis of clinical practice and preventive medicine.

**Research:** As quoted by Albert Szent-Gyorgyi, Nobel Laureate in Physiology or Medicine (1939), “Research is to see what everybody else has seen and to think what nobody else has thought.” Einstein and Infeld, 1938 said that “The formulation of a problem is often more essential than its solution, which may be merely a matter of mathematical or experimental skill. To raise new questions, new possibilities, to regard old questions from a new angle, require creative imagination and marks real advance in science.” Research comprises creative work undertaken on a systemic basis in order to increase the stock of knowledge, including knowledge of humanity, culture and society and the use of this stock of knowledge to devise new applications.

**Research Culture:** Research is a learned behaviour and the research culture is the structure that gives that behaviour significance and that allows us to understand and evaluate the research activity. In a medical college, the research culture is based around the behaviour of the staff and
students that allow us to transfer the knowledge gained through this systemic process to our students and the community at large.

Developing Research Culture: Building research culture is a team work and it requires dedicated hard work, commitment by the faculty members, management and the students. It is a slow process which evolves over a period of time with continuous systemic efforts.

If an institute wants to develop research culture, the most important step is to change the mindset of its staff members towards research. Staff members need to become research oriented, they need to think and read about relevant research work in context to the need of society, do proper planning and execution of intended research work, share their research ideas and findings with scientific peer-groups, students, stakeholders and community.

Another important element for developing research culture in a medical college is to make reforms in the medical education starting from undergraduate level. A Research Oriented Medical Education (ROME) curriculum should be implemented such that it facilitates a sense of enquiry amongst students which would drive their learning. Research projects should be incorporated in the undergraduate curriculum to sensitize the students towards research methodology and the significance of research in medical science. Students must be encouraged to participate as observers and as well as voluntary human participants in various research works going on in the department. Faculty development program and good mentoring of the students with regards to research would help strengthening the research culture in a medical college.

But, the most important element in the journey of developing the research culture is to convince ourselves, medical faculty members that research and teaching are complimentary and we need to change as rightly said by Late M.K.Gandhi, “Be the change you want to see in the world”.

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ORATION AWARDS

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Why Sleep is Important?
At a time when mobile phone, internet and late night television have turned us into 24/7 hour society, the nation is not getting adequate sleep. The concept of a ‘Good night’s sleep’ has become an illusion. The question of why do we sleep is not that easy to answer. For millennia the mankind thought they know the answer. Aristotle thought it had something to do with digestion. Later physicians thought that the brain is congested with blood which resulted in its shut down. We have come long way to understand the mechanism of sleep, but we are still not sure why it happens. If sleep is a state of inactivity it must be for rest. The answer is probably partially correct. More activity during wakefulness does not reliably produce more
sleep and physical rest does not remove the urge to sleep. Some people feel that one can survive without sleep. Sleep is an useless exercise. The intense sleepiness, the extreme difficulty in mediating wakefulness for more than two three days, the willingness to put end to one’s own life at risk, this compelling need to sleep is so powerful that it cannot be avoided. It is now proved beyond doubt that sleep and wakefulness are physiologically two different states of our existence. Sleep is not merely absence of wakefulness. Moreover non rapid eye movement (NREM) and rapid eye movement (REM) sleep are fundamentally two different physiological states. Wake and sleep, both are regulated by active neural mechanisms. There are separate mechanisms for NREM and REM sleep. Till now the primary function of sleep is a mystery. But the society is gradually learning the harmful effect of sleep deprivation/restriction. The physicians who never look to a patient after he goes to sleep is no more true. Monitoring of sleep is important for diagnosis and treatment of sleep disorders. It is time that the Association of Physiologist and Pharmacologists of India advocates introduction of sleep physiology and medicine in the under graduate curriculum. Besides good nutrition and exercise, sleep is the latest message for a healthy and wealthy society.

The history of faculty development programs goes back to the setting of medical colleges and institutes in our country. The organized programs stared in the form of national teacher training programs, which phased out because of long duration of course, financial issues and lack of follow-up. These programs had an impact as methodology and format was similar to some extent. However, at that stage the medical education worldwide was undergoing a sea change. Flexner reports changed the way basic sciences were taught throughout the world. Earlier, there were less people opting for postgraduation in basic and paraclinical sciences as compared to clinical sciences. Faculty development program were neither taken up by faculty nor encouraged by institutes/regulatory bodies. However, the trends are showing a change now. Nowadays, even the students, as stakeholders have expressed their views about the changes required in teaching-learning activities. All this led to the more structures and organized Medical Council of India (MCI) course in medical education and technology. The course has standarised 3 days curriculum and being done with faculty trained in standard techniques. The course is being supervised and feedback has been implicated in improving the course. The course is being run under guidance and supervision of MCI regional centre for faculty development. The initiative has been taken because now in our country we have generated a critical mass of educators from medical community. Then fellowship in medical education being offered at 3 places in India under Foundation for advancement of International medical education and research (FAIMER) regional institutes further strengthened the critical mass. The faculty who is trained in various avenues in the last two decades has now assumed various important administrative
positions and are also in regulatory agencies. This has resulted in National conference of health professional education being organized very successfully for the last 5 years. The stage has come where institutes have started degree course in medical education and it even might be a regular degree in medical profession. More and more faculty is opting to get trained in faculty development programs as the awareness has increased and regulatory agency is making it criteria for teaching appointments. With accreditation becoming a norm, soon the trained faculty and faculty development program will be much sought after. I have seen during my interaction with faculty from throughout India, the change of viewpoint of faculty from referring these programs from “useless” to “very important and must”. The positive enthusiasm and energy of these faculty development programs, have led to commencement of online faculty development forums and discussion groups. The publication houses are planning to start online courses and modules in faculty development. Even some colleges and universities are using this as criteria for academic appointments and promotions. The whole consortium of trained faculty and feedback from students and faculty is contributing to evolution of medical education in our country. This has led to proposed major changes in undergraduate medical curriculum in the coming years.

M. L. GUPTA PRIZE IN MEDICAL EDUCATION AND TECHNOLOGY 
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Learning Of A Teacher

Teaching is my passion. I enjoy teaching, I love teaching. I am teaching physiology to my students from last 32 years, and I always pray to Almighty that the last day of my life may be passed in the lecture hall in front of my students. Teaching and learning are complimentary to each other. There are many definitions of teaching and learning, but I like the following 3 statements from great teachers and philosophers which are as follows:

1.-"Tell me and I forget. Teach me and I remember. Involve me and I learn." -- Benjamin Franklin
2.-“It is the supreme art of the teacher to awaken joy in creative expression and knowledge.” -- Albert Einstein
3.-Learning is finding out what we already know. Doing is demonstrating that you know it. Teaching is reminding others that they know just as well as you. You are all learners, doers, and teachers.” -- Richard Bach

I always believe that I have learnt not only a lot of physiology but also many virtues and life lessons from my students throughout my teaching career.

What teachers learn from students?
A teacher learns recent and update information of the subject.
I have learned patience (over and over again!)
I have learned that everyone is capable of learning but not everyone learns in the same way.
I have learned humility and kindness.
Students have taught me that I am always a student. We never stop learning. We are life-long learners.
I have learned to find love in my worst student.
I have learned how to be obedient, how to pay respect, how to express thanks and gratitude.
Some of my students have become my teachers now. My best dreams, my happiness, and my satisfaction and future are associated with my students. My students are my own reflections. I always believe that the best profession in the world is teaching. Teaching is the best way of learning. In the end I want to say that the greatest education is kindness, love, compassion, and care. I have no hesitation to say that I have learned kindness, love, compassion, and care from my students.

A V TILAK PRAVATI DEVI AWARD FOR THE BEST PAPER IN ENDOCRINOLOGY /NEUROENDOCRINOLOGY
Dr Piyali Das*, Subhradeb Biswas, Aniruddha Neogi, Maninay Bandyopadhyay, Debojyoti Bhattacharjee, Dept of Physiology, CNMC, Kolkata
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Study Of Cardiovascular Autonomic Dysfunction In Type- 2 Diabetes Mellitus.

Objectives: Autonomic neuropathy is a common complication of diabetes mellitus which may affect major systems like cardiovascular system that may cause early death in diabetics. In our study attempt was made to assess different cardiovascular autonomic function parameters in diabetics of different duration and non diabetic controls.

Methods: Level of fasting blood glucose (FBG) and glycosylated hemoglobin (HbA1C) were measured in 60 type 2 diabetics and 30 age sex matched non diabetic control. Cardiovascular autonomic function parameters like change of blood pressure from supine to standing posture (postural BP changes) and ratio of longest and shortest R- R interval during deep expiration and inspiration respectively (E/I ratio) on ECG were recorded from them. Diabetics were subdivided into <5 years and >5 years groups. Findings of different group and sub groups were compared by unpaired student’s t- test. Correlation between glycaemic control, duration of disease and autonomic function parameters were tested by co-efficient of correlation.

Results: We found, a significant difference in postural BP changes and E/I ratios between diabetics and the controls, no significant correlation could be found out between glycaemic control or duration of disease and autonomic function parameters.

Conclusion: Our study concludes that diabetes may lead to autonomic dysfunction that may cause postural hypotension and altered E/I ratio irrespective of the duration of disease and glycemic control.

PROF KP PUTHURAYA AWARD FOR THE BEST TEACHER IN PHYSIOLOGY
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Teacher – Student Relationship in Medical Education

With the development of medical knowledge, teaching in medical colleges across India has also evolved both as an art and a science. With the help of new teaching learning aids, medical teaching has gained importance as an experimental field giving rise to a lot of innovative methods, all aiming at a better output and fostering the learning process. But the area that has been neglected is the teacher – student relationship in medical education.
With the rapid increase in the number of medical colleges, there is shortage of teachers in basic sciences, and the changing rules have decreased the teacher – student ratio to a large extent. Moreover, research and publication has emerged as a necessity in the career progression, which is no doubt a welcome move. As the medical teachers get themselves adapted to the growing pressure imposed upon them, there is a risk of the traditional teacher student relationship being replaced by a mere customer - supplier relationship. For the 'good teacher', teaching is a process to promote learning that will kindle the desire to explore the unknown, not a display of knowledge. Though, imparting knowledge and skill within the framework of syllabus and time period remains as the ultimate aim, it is not simply a give and take relationship rather a phenomenon of growth not only of the academic field but also of the teacher- student relationship. The teaching- learning process enriches both of them.

Having qualities like ability to take organized lecture classes, punctuality may not be sufficient to develop a good teacher- learner relationship. A teacher who is approachable, helpful and has a good communication skill will be able to foster this relationship better. As the medical education points to more humanistic approach to patient care, medical teachers have to become role models for students in terms of attitudes and ethics. A good medical educator not simply a good medical teacher is the need of the time.

To build up a positive and supportive relationships with his/her teacher, a student need to have frequent communication with the teacher, receive more guidance and praise rather than criticism from the teacher and overcome the hesitation of consulting and discussing different problems. All these will give a feel of personal connection to the teacher and the student will develop more trust in the teacher. Though few studies show that positive teacher-student relationship had no statistically significant effect on the academic grades of the student, it definitely helps to display better classroom behavior and more interest and commitment to the teaching process.

There should be training programs for teachers to promote teaching attributes known to facilitate teacher – learner relationship and student - centered teaching. Besides, methods of assessment of teachers by the students should be developed as students will be in the best position to judge the impact of individual educators on their development.

Reducing the traditional teacher centered-academic education and implementing more interactive teaching like tutorial-based, problem based and student-centered learning will help to establish an effective teacher student relationship.

**PROF GK PAL AWARD FOR BEST RESEARCH PAPER PUBLISHED IN IJPP**

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**Inflammation And Oxidative Stress In Hypothyroids: Additive Effects On Cardiovascular Risk**

Cardiovascular disease is one of the major complications of hypothyroidism which is one of the most common endocrine disorders.
in India. In the present study, we have analyzed the link among oxidative stress, C reactive protein which is an inflammatory marker and the cardiovascular lipid risk factors in hypothyroid patients which has not been analyzed before. Sixty seven untreated hypothyroid patients were recruited consecutively for the study. Their ultrasensitive C reactive protein level and oxidative stress profile were measured apart from various lipid risk factors of cardiovascular disease. Ultra sensitive C reactive protein was significantly correlated with increased lipid risk factors of cardiovascular disease, thyroid stimulating hormone level and indices of oxidative stress in these patients. Low grade inflammation in hypothyroidism plausibly acts as the link between higher oxidative stress and the underlying cardiovascular risk among hypothyroid patients.

Key words: ultrasensitive C reactive protein, oxidative stress, hypothyroidism, cardiovascular risk.

PROF. R C SHUKLA ORATION AWARD FOR THE BEST PAPER IN CARDIOVASCULAR PHYSIOLOGY
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Terminalia Arjuna Improves Myocardial Functions And Autonomic Control In Streptozotocin Induced Diabetic Rats: Possible Mechanisms

The present study was designed to examine the therapeutic potential of Terminalia arjuna bark extract in improving myocardial functions and autonomic control in Streptozotocin (STZ) induced diabetic rats. The baroreflex was evaluated by measuring the changes in heart rate (HR) with changes in arterial blood pressure induced by bolus injections of phenylephrine (vasoconstrictor) and sodium nitroprusside (vasodilator). T. arjuna bark extract, rosuvastatin and Insulin were tested/administered therapeutically in rat model of uncontrolled diabetes. After 8 weeks of STZ administration the reflex bradycardia and tachycardia response to hypertension and hypotension respectively were impaired in the diabetic group. Rats showed decline in left ventricular pressure (LVP), maximal rate of rise and fall of left ventricular pressure [LV (dP/dt) max and LV (dP/dt) min], cardiac contractility index [LV (dP/dt) max/LVP], and rise in LV end-diastolic pressure. Altered lipid profile, oxidative stress and increased levels of Endothelin 1, tumour necrosis factor-α (TNFα), interleukin 6 (IL6) along with histological changes in heart and pancreas were observed in diabetic rats. The reflex bradycardia improved significantly after one month treatment of T. arjuna while the reflex tachycardia did not improve. T. arjuna significantly attenuated cardiac dysfunction and myocardial injury in diabetic rats. The decreased body weight, heart rate and blood pressure and raised blood sugar in diabetic rats were not improved by T. arjuna therapy. Rosuvastatin treatment exerted similar effects while Insulin improved all the parameters. Further T. arjuna, rosuvastatin and Insulin significantly reduced oxidative stress, Endothelin 1 and inflammatory cytokine levels in diabetic rats. Results suggest that T. arjuna bark extract improves the altered myocardial functions and baroreflex sensitivity in diabetic rats possibly through maintaining endogenous antioxidant enzyme activities, decreasing Endothelin 1 and cytokine levels.
**Key words:** Baroreflex sensitivity; Myocardial functions; Cytokines; Diabetes Endothelin 1; Oxidative stress; Terminalia arjuna

**H.H. LOESCHEKE RESEARCH PRIZE**

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**Respiratory Belt Transducer Constructed Using A Singing Greeting Card Beep**

An article published in Advances in Physiology Education by Belušič and Zupančič described the construction of a finger pulse sensor using the singing greeting card beeper. This beeper can be modified easily to function as a respiratory belt transducer that can monitor respiratory movements. The beeper was modified in such a way that the piezo-electric device of the beeper gets strained by chest expansion. The strain on the piezo-electric device of the beeper produces a voltage change which can be acquired on a data acquisition system or an oscilloscope. A video describing the construction of the respiratory belt transducer can be seen in YouTube at http://youtu.be/brTVT--qcwl. Normal respiratory movements were recorded by strapping the respiratory belt transducer to the chest at the level of the nipple. The transducer also responded very well to rapid respiratory movements. Demonstration of respiratory sinus arrhythmia was done for undergraduate medical students during a theory lecture by using this transducer along with the finger pulse sensor described in the article by Belušič and Zupančič. Construction of this transducer was also given as a practical assignment to M.Tech clinical engineering students and they were able to construct it quite easily. This transducer can be used to monitor the depth and rate of respiration. It can also be used for recording respiratory movements in animals. The respiratory belt transducer is versatile enough to be connected to other common data acquisition systems like BIOPAC or PowerLab for recording respiratory movements for teaching or research purpose.
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ABSTRACTS
(Oral and Poster Presentations)
CONCLUSION: Making allowance for body composition can improve the accuracy & biological relevance of reference equation for expiratory & inspiratory flow rates. Because of limited usefulness of BMI, which includes both body fat & muscle mass and is unable to discriminate whether increased BMI is due to increased fat or muscle mass, FFM & FFMI should be used as reference variables.

SV02OP

BISPHENOL A DEPRESSES SPINAL SYNAPTIC TRANSMISSION INVOLVING ESTROGEN RECEPTOR MEDIATED MECHANISMS

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OBJECTIVES: Bisphenol-A (BPA), a toxic chemical from polycarbonate plastics, is known for behavioural and neural abnormalities. Therefore, la-α motoneuron synapse was used to find out the alterations in the neural activity. Effect of BPA on spinal segmental reflex potentials is not available. Therefore, present investigation was undertaken to study the effect of BPA on spinal synaptic transmission in neonatal rat spinal cord in vitro.

METHODS: The experiments were performed on isolated hemisected spinal cords from 4 to 6 days old rats. Stimulation of a dorsal root with supramaximal strength at 0.1 Hz evoked monosynaptic (MSR) and polysynaptic reflex (PSR) potentials in the corresponding segmental ventral root.
RESULTS: Superfusion of BPA depressed the spinal reflexes in a time- and concentration-dependent (3-100 µM) manner. BPA at 30 and 100 µM produced 50 and 75% depression at 25 min, respectively. The time required to produce 50% depression (T-50) of MSR and PSR was around 20 min. Pretreatment with an Erα antagonist (tamoxifen) (10 µM) blocked the BPA-induced depression in spinal synaptic transmission, however, estradiol (E2 or 17β-estradiol) did not produce any significant alteration in the amplitude of MSR or PSR even at the concentration up to 10 µM.

CONCLUSION: The present observations indicate that the BPA depressed the MSR and PSR involving Erα receptor that are not specific for estrogen mediated mechanisms (As supported from UGC).

KEYWORDS: Monosynaptic reflex, Polysynaptic reflex, Plastics, 17β-estradiol, spinal cord.

SV03OP

AGE AND GENDER RELATED CHANGES IN TEAR PHYSIOLOGY IN NORMAL INDIAN SUBJECTS: PROPOSAL OF NEW TEAR FUNCTION TEST VALUES

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OBJECTIVES: Dry eye syndrome is currently seen with increasing frequency throughout the world including India. An evaluation of tear physiology in the form of tear secretion and tear film stability is the most important aspect of dry eye diagnosis. The aim of this study is to investigate the age and gender related changes in the result of these tear function tests (Schirmers Test and Tear Break up time) in normal Indian population.

METHODS: This cross-sectional observational study included 120 normal subjects (60 Male and 60 females) with no ocular symptoms or ocular surface disorders. Schirmer and tear film break-up time tests were assessed in both eyes of each subject. The study subjects were divided into 4 groups according to their ages (< 20y, 20-40y, 41-60y and > 60y) each group was composed of 60 eyes of 30 subjects (15 male and 15 female subjects). The ANOVA test, The F-test, the F- ratio and the Statagraphic software was used for statistical analysis.

RESULTS: We detected a statistically significant decline in both the tear function tests with increasing age. Tear function tests did not show statistically significant difference according to sex.

CONCLUSION: This study suggests that the age of subjects should be taken into consideration in the evaluation of tear function test results. It is also revealed that Indian population values are different from Caucasian and Chinese values. We propose age specific cut off values of tear function tests in Indian population to aid in the diagnosis of dry eye in Indian conditions.

SV04OP

INTERLEUKIN-6 AND DIABETES RISK FACTORS ARE MODIFIED BY YOGA BASED LIFESTYLE INTERVENTION IN OBESITY

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OBJECTIVES: Obesity is a chronic inflammatory condition, characterized by increased levels of many cytokines. Interleukin-6 (IL-6) is the key pro-inflammatory and inflammatory cytokine responsible for impaired glucose tolerance and inhibition of its signaling, leading to development of diabetes mellitus (DM) type II. Therefore, this study was planned to assess the impact of a lifestyle intervention on IL-6 and diabetes risk factors in overweight/obese subjects.

METHODS: The present study included 31 overweight/obese subjects (BMI ≥ 23 to 35Kg/m²; mean age 45±5 years) with no history of DM, attending a pretested lifestyle intervention program at Integral Health Clinic (IHC), Department of Physiology, AIIMS, New Delhi. Anthropometric parameters (weight, height, BMI, waist hip [W/H] ratio, skin fold thickness, total body fat, pulse rate (PR), blood pressure (BP), fasting blood glucose (FBG), lipid profile, and IL-6 were measured before and after 10 days of the yoga-based life style intervention.

RESULTS: Following this intervention, there were significant improvements in weight (p=0.0001), BMI (p=0.0038), HR (p=0.0001), W/H ratio (p=0.0425), total cholesterol (p=0.0498), LDL/HDL ratio (p=0.0292), FBG (p=0.0050), and IL-6 (p=0.0218) in overweight/obese subjects. IL-6 was significantly correlated with BMI, FBG and W/H ratio at baseline (r =0.4536, p=0.0104; r=0.3659, p=0.0429; r=0.410, p=0.0021, respectively) as well as at Day 10 (r=0.6110, p=0.0003; r=0.4364, p=0.0141; r=0.5853, p=0.0005, respectively). A reduction in WHR was significantly correlated with reduction in IL-6.

CONCLUSION: These results suggest that weight reduction can modify most of the risk factors of diabetes even after a short-term yoga based life style intervention in overweight/obese subjects as evident by significant reduction of IL-6.

SV05OP

AUTONOMIC REACTIVITY IN PREMENSTRUAL SYNDROME

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OBJECTIVES: Premenstrual syndrome (PMS) is a group of psycho behavioural symptoms experienced by many susceptible young women prior to menstruation. It is suggested that there is altered autonomic activity in the late leuteal phase of their endometrial cycle. The present study is aimed to see the autonomic reactivity in women suffering from PMS and to compare it with control ones.

RESULTS: The results revealed that the autonomic activity—sympathetic as well as parasympathetic, is insignificantly higher in PMS group during follicular phase. During leuteal phase, the parasympathetic activity is significantly lowered but the sympathetic activity is significantly increased. A positive correlation was also seen between both limbs of autonomic system with number of symptoms.

CONCLUSION: It appears that increased sympathetic activity coupled with decreased
parasympathetic activity during the luteal phase might be responsible for psychophysiological changes in these women. However, the exact mechanism is still unknown.

**KEYWORDS:** Premenstrual syndrome, Sympathetic activity, Parasympathetic activity, sympathetic vagal imbalance

**SV06OP**

**EFFECT OF BISPHENOL-A ON UTERINE CONTRACTIONS IN ADULT RATS DURING ESTROUS PHASE**

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**OBJECTIVES:** Bisphenol-A (BPA) toxic chemical from the plastics is implicated in reproductive abnormalities in man and experimental animals. BPA is known to possess estrogenic activity. Therefore, present study was undertaken to know the effect of BPA on uterine contractions in vitro.

**METHODS:** Adult female rats were used. Vaginal smear was taken and estrous phase was confirmed. Then rats showing estrous phase were killed by cervical dislocation and exsanguination. The uterus was dissected and uterine segment (10-15mm) was isolated and fastened to glass tissue holder and force transducer. A resting tension of 2g was given; the isometric contractions were recorded on student physiograph after stabilization. Recording of spontaneous contractions was performed by exposing the tissue to cumulative concentrations of BPA (0.1-10µM). In another series, the tissue was pretreated with tamoxifen (ERα receptor antagonist) or lidocaine (local anesthetic) and subsequently exposed to various concentration of BPA.

**RESULTS:** BPA produced concentration-dependent decrease in frequency and force of uterine contractions. At 3 µM, the force was decreased by >75% and at 10µM the contractions were totally abolished. Tamoxifen failed to block the BPA-induced concentration dependent decrease in uterine contractions. Whereas Lidocaine partially antagonized the BPA contractions.

**CONCLUSION:** Present results indicate that BPA decreased the force and frequency of spontaneous uterine contractions and decreases were not mediated through ERα receptors. However, the plexuses present in the uterine myometrium partially mediate BPA induced decrease in contractility.

**KEY WORDS:** Tamoxifen, Lidocaine, Plastic chemical, uterine contractility.

**SV07OP**

**VARIATIONS IN IRON STATUS INDICATORS IN DIFFERENT PHASES OF MENSTRUAL CYCLE – A STUDY OF TWO AGE-MATCHED SOCIO-ECONOMIC GROUPS OF 18 – 25 YEARS OF AGE**

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**OBJECTIVES:** Iron requirements are increased in adolescent girls with growth and the onset of menarche and remain high in women until menopause.
METHODS: We conducted a study on two study groups of girls in age group 18-25 years belonging to different socioeconomic classes as per the Modified Kuppuswamy’s Scale to study the effect of the phases of menstrual cycle & socioeconomic class on the iron status indicators (Hb, Serum Iron, TIBC, MCV & TS%). Menstrual phases were defined and blood sample was drawn from all the girls in all the 3 phases (menstrual, follicular & luteal) and Hb, Serum iron & Total iron binding capacity was assessed on a semi-auto-analyzer & MCV was estimated using a fully automated CBC machine. Transferrin Saturation was derived as Serum Iron / TIBC × 100.

RESULTS: We found significant (p< 0.01) difference in iron status indicators in both our groups, the values of iron status indicators varied significantly according to the menstrual cycle, with values highest during the luteal phase and lowest during the menstrual phase.

CONCLUSION: From our observations we can conclude that the nutritional status (assessed by the height, weight & BMI) and the iron status indicators both differ significantly in the two age-matched comparable socioeconomic groups. Hence, socio-economic class has a major determining role on an individual’s health. The effect of hormonal fluctuations during the menstrual cycle also has a part to play in the variation of iron status measures, which has to be considered while measuring them in a female during her reproductive years.

Keywords: Iron status indicators, Menstrual Cycle, Socioeconomic Status

CEREBROVASCULAR REACTIVITY IS NEGATIVELY CORRELATED WITH INSULIN RESISTANCE IN TYPE 2 DIABETES MELLITUS

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OBJECTIVES: Increased risk of cerebrovascular diseases in type 2 diabetes mellitus (DM) is associated with impaired cerebrovascular reactivity (CVR). Insulin resistance has been negatively correlated with systemic vascular reactivity in type 2 DM patients; however its relationship with CVR has not been reported. The aim of the study was to investigate the relationship between CVR and insulin resistance in the patients of type 2 diabetes mellitus.

METHODS: CVR was assessed by measuring the changes in mean middle cerebral artery blood flow velocity (MCAV) and cerebrovascular conductance index (CVCi) after breathing of 6% CO2 and after 30 second breath hold, in 34 uncomplicated type 2 diabetic patients. MCAV was measured by Transcranial Doppler Ultrasonography. CVCi was calculated as MCAV/Mean arterial pressure to correct for the influence of associated changes in BP on MCAV. Insulin resistance was assessed by Homeostatic model assessment of insulin resistance (HOMA-IR).

RESULTS: Significant correlation was found between HOMA-IR and CVR calculated by changes in MCAV after breathing of 6% CO2 (r
but not after breath holding. Significant correlation was found between HOMA-IR and CVR quantified by changes in CVC after breathing of 6% CO2 (r = -0.3749, p = 0.0289) and after breath holding (r = -0.3746, p = 0.0291).

CONCLUSION: CVR is negatively correlated with insulin resistance in type 2 DM. Diminished CVR indicating the altered functional reserve of cerebral vasculature may be the pre-runner of stroke and related cerebrovascular events in type 2 DM.

SV09OP
CAPSAICIN-INDUCED HYPERTENSIVE RESPONSE INVOLVES ENDOTHELIN-DEPENDENT MECHANISMS

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OBJECTIVES: Capsaicin (8-methyl-N-vanillyl-6-nonenamide) is known to stimulate pulmonary C reflexes and produces triphasic pressure response in rats. The mechanisms underlying capsaicin-induced intermediate hypertensive response are not known. Therefore, the present study was undertaken to delineate the mechanisms underlying the capsaicin-induced intermediate hypertensive response.

METHODS: The trachea, jugular vein and femoral artery of anaesthetized adult albino rats were cannulated. Blood pressure, respiratory excursions and ECG were recorded in response to bolus injection of capsaicin (10µg/kg; i.v) before and after vagotomy in the absence or presence of bosentan (ETA and ETB receptor antagonist, 10mg/kg).

RESULTS: Capsaicin produced the triphasic pressure response characterized by immediate hypotension followed by recovery (intermediate phase) and delayed hypotension. After vagotomy, the immediate hypotension was abolished and the intermediate pressure response was augmented as a hypertensive response while the delayed hypotensive response persisted. Pretreatment with bosentan blocked the augmentation of intermediate hypertensive response in vagotomised animals.

In case of respiration and heart rate, time-matched respiratory changes after capsaicin manifested as immediate and intermediate bradypnea and delayed tachypnea while the heart rate changes showed bradycardia at all phases. Vagotomy abolished the tachypneic response at the delayed phase and bradycardiac response at all the phases. Bosentan pretreatment did not alter the heart rate and respiratory changes seen after vagotomy.

CONCLUSION: The capsaicin-induced intermediate hypertensive response involves endothelin-dependent mechanisms. Further, the intermediate pressure response is independent of the changes in heart rate and respiratory rate (supported by the grants from ICMR).

SV10OP
PROTECTIVE ROLE OF PROSTAGLANDINS IN OLEIC ACID INDUCED ACUTE LUNG INJURY IN ANAESTHETISED ADULT RATS

Parul Sharma*, Shripad B. Deshpande & Ratna Pandey
OBJECTIVES: This study was undertaken to find out the mechanisms underlying the pathophysiology of acute lung injury (ALI) in rats and to know the role of prostaglandin.

METHODS: ALI was induced in rats by i.v. injection of oleic acid (O.A.) in anaesthetized rats. Respiratory rate, \( \text{PaO}_2/\text{FiO}_2 \), pulmonary water content, blood pressure, heart rate and survival time were determined. Histological examination of lung was also done. Animals were divided into four groups. In group I, O.A. was injected. In group II and III group O.A. (60 \( \text{ml} \)) was injected 30 minutes after pretreatment with ethanol and indomethacin (dissolved in ethanol) respectively. In group IV pretreatment with indomethacin followed by misoprost (a prostaglandin agonist) was done and then O.A. was injected.

RESULTS: O.A. produced dose dependent pulmonary toxicity as manifested by changes in respiratory rate, decrease in \( \text{PaO}_2/\text{FiO}_2 \) ratio, development of pulmonary edema and polymorphonuclear cell infiltration. Changes in heart rate and mean arterial pressure were also observed after O.A. injection. Lethality was observed at higher doses. Indomethacin pretreatment drastically advanced the oleic acid induced injury and killed the animals within 10 min. Misoprost improved the indomethacin induced toxicity and increased the survival time (80 minutes).

CONCLUSION: Prostaglandins play a critical role in the pathogenesis of ALI induced by O.A. (supported by the grants from ICMR).

KEY WORDS: Acute lung injury, indomethacin, prostaglandins, oleic acid.

SV11OP

H-REFLEX STUDY IN NEONATES WITH MENINGOMYELOCELE

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OBJECTIVES: To assess the neurological deficit in neonates suffering with neural tube defect – meningomyelocele (MMC) using non-invasive H-reflex studies.

METHODS: In this preliminary study, we investigated 20 full-term newborn babies within one month of age. Nine (9) neonates were suffering from MMC of lumbosacral region and the rest 11 newborns were normal. The electrophysiology studies were done with surface electrodes using BSL Advanced System and GRASS Stimulator model S88. H-reflex latency (HRL), maximum amplitude of H-reflex (Hmax), maximum motor response (Mmax), and H/M ratio (i.e. reflex excitability of motor neuron) were recorded at right lower limb (posterior tibial nerve - soleus muscle).

RESULTS: H reflex was elicited in all babies except 4 neonates who were suffering from MMC. In 5 cases of MMC where H-reflex was elicited, the mean value of HRL (12.3ms) was less compared to the values obtained in control babies (HRL =13.25ms). However, this difference was insignificant. On comparing other parameters, the neonates
suffering with MMC had statistically significant lower values of Hmax (1.44mv), Mmax (3.18mv) and H/M ratio (35.08%) when compared with normal babies (Hmax = 2.41mv; Mmax = 4.77mv; H/M ratio = 48.82%).

**CONCLUSION:** Spinal cord segment along with its roots was affected in neonates suffering from meningomyelocele with partial or complete loss of spinal H-reflex and impaired muscle activity.

**KEYWORDS:** H-reflex, Meningomyelocele, Neonate.

**SV12OP**

**OBESITY, FAMILY HISTORY AND RISK OF TYPE 2 DIABETES MELLITUS IN MEDICAL STUDENTS**

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**OBJECTIVES:** Obesity and family history of diabetes have become major predictors of type2 diabetes. This study aims to determine occurrence of obesity, establish association between presence of family history of diabetes and obesity and evaluate risk of developing diabetes in healthy medical students.

**METHODS:** Study included 300 MBBS students. Detailed history about their age, family history of diabetes and exercise was taken. BMI (kg/m²) was calculated and waist circumference (WC) was measured. Body fat% was calculated using skinfold thickness. Risk of diabetes was assessed using Indian Diabetes Risk Score. BMI, fat% & WC were compared between students with and without family history. 38% were overweight, 15.3% obese and 0.3% morbidly obese.

**RESULTS:** Risk of developing diabetes was high in 6%, moderate in 87.3% and low in 9.7% of students. There was a significant increase in fat% and WC in subjects with family history as compared to those without family history.

**CONCLUSION:** Obesity and risk of diabetes were present in more than 50% of the medics. Family history was associated with increase in body fat% and WC in medical students.

**KEYWORDS:** Obesity, Family history of diabetes, fat %, BMI, waist circumference, risk of diabetes.

**SV13OP**

**STUDY OF CONTRACTILE ACTIVITY OF COLONIC AND RECTAL SMOOTH MUSCLES IN NEONATES WITH ANORECTAL MALFORMATIONS**

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**OBJECTIVES:** The anorectal malformation (ARM) is common congenital problem in neonates and chiefly managed by surgical interventions. Some histopathological studies are available, the contractile status of the tissue in anorectal malformation is not clear. Therefore present study was undertaken to assess the contractile status of proximal & distal segment of ARM thus facilitate better surgical management.
METHODS: Circular muscle strips were prepared from freshly excised specimens of ARM (n= 17) and non- ARM cases (n=9) obtained directly from paediatric surgery operation theatre, S.S. Hospital, B.H.U., Varanasi. The contractile activity of the tissue was assessed by application of hexamethonium (ganglion blocker) and cholinergic and histaminergic agonists as well as their antagonists in an organbath filled with Krebs-Ringer solution continuously bubbled with 100% oxygen. The isometric contractile activity was recorded with the help of transducer and digital recording system (ADI instrument, Australia). Histopathological observations were made by using H&E stain.

RESULTS: More than 70 % of control specimens showed any spontaneous contractions. However in ARM cases only 18 % of proximal segment and none of the distal segment showed any spontaneous contractions. Histamine and Acetylcholine (0.1-100 µM) evoked contractions were significantly greater (p ≤ 0.05) in proximal segment as compare to distal segment. Equimolar concentration of histamine produced significantly greater (p ≤ 0.05) responses as compared to acetylcholine. Responses of histamine were significantly blocked (p ≤ 0.05) by pre-application of pheniramine and hexamethonium by 90% and 50 % respectively. Preapplication of atropine and hexamethonium significantly blocked (p ≤ 0.05) (85 %) and insignificantly enhanced acetylcholine responses respectively. Histopathologic examination revealed muscular abnormalities like thickening or thinning, infiltration of inflammatory cells along with ganglion abnormality like decrease number of ganglion cell in the myenteric plexus.

CONCLUSION: Tissue in ARM cases appeared to abnormally functional on account of absence of spontaneous activity and associated histopathological findings. However, chemically evoked contractility to some extent is retained in all segments of rectal tissue of ARM with severe impairment in contractility in distal segment. The result of this study may facilitate the formulation of better surgical management strategies.

SV140P
Nerve conduction velocity in malnourished children.
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OBJECTIVES : Malnutrition is the commonest cause of children's growth and developmental delay in developing countries. In 2005–06 an estimated 42.5% of Indian children and 42.4% of children in Uttar Pradesh under five years of age were underweight. Under-nutrition is the underlying cause for about 50% of the Under-5 deaths in India each year. Most of the reflexes of the fetus that involve the spinal cord and even the brain stem are present by the third to fourth months of pregnancy while the process of myelination begins at about 14-20 weeks of gestation and continues through the first few years of life. By acting as an electrical insulator, myelin greatly speeds up action potential conduction along the nerve cells. For myelination of nerves nutrition is a very important factor and this process may be affected in children suffering from malnutrition.

We conducted this study to evaluate the effects of protein energy malnutrition on nerve conduction velocity of peripheral nerves in children.
METHODS: 40 children suffering from protein energy malnutrition and 45 healthy children aged from 6 months to 4 years were included in the present study. Assessment of nutritional status was done according to the recommendations of the Nutrition Subcommittee of the Indian Academy of Pediatrics. Motor nerve conduction velocity (MNCV) of Ulnar, Median and Common peroneal nerves was measured. Statistical analysis is done with the help of Statistical Package for Social Sciences version 17.0 (SPSS) software.

RESULTS: Motor nerve conduction velocity (MNCV) was significantly reduced in children suffering from severe protein energy malnutrition.

CONCLUSION: Malnutrition has serious effects on the development of nervous system in children.

HARISH GUPTA UG PRIZE
PAPER ABSTRACTS

HG01OP
POOR ADHERENCE AMONGST PATIENTS ON ANTIRETROVIRAL THERAPY: A CASE CONTROL STUDY

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OBJECTIVES: Antiretroviral therapy has changed the face of HIV epidemics from fatal disease to a chronic manageable illness. Very good adherence (i.e. > 95%) to the ART is required for its success. Poor adherence to ART leads to development of resistant strains of virus with failure of first line ART. This study was undertaken with the aims to assess the reasons for poor adherence amongst patients on ART and to make suitable recommendations to minimize this problem.

METHODS: In this case control study conducted at an ART center from Jan 2012 to Aug 2012, a total of 70 cases with poor adherence and equal numbers of controls with good adherence to ART were included. Cases were interviewed telephonically and controls were interviewed personally at the ART center according to preframed and validated questionnaire. The patient treatment records of cases was analysed to understand their demographic profile.

RESULTS: Mean age of cases and controls were 37.82±4.2 years and 35.92 ±5.4 years respectively. Of the 70 cases, 45% gave wrong phone numbers, 48% gave wrong address and 40% had a HIV +ve partner. The important associations with poor adherence included family obligations that hampered with drug collection and adherence, consumption of ayurvedic medicines instead of ART, side effects to ART, long waiting period at the ART center and fear of facing doctor after missing doses of ART (p values < 0.05 for all).

CONCLUSION: Most patients gave wrong address and phone numbers fearing social stigma. Social and cultural barriers, adverse effects of ART drugs and poor patient’s experience at ART Centre resulted in poor adherence patterns. Corrective measures should focus on the above issues.

KEY WORDS: Poor Adherence, Anti-retroviral therapy, Ayurvedic medicine, drug resistance.
**HG02OP**

**CORRELATION OF CIRCULATING SERUM OREXIN LEVEL WITH METABOLIC RISK MARKERS IN OBESE SUBJECTS.**

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**OBJECTIVES:** Correlation of Circulating Serum Orexin level with metabolic risk markers in obese subjects. To compare the lipid profile and other metabolic risk markers including neck circumference (NC), waist circumference (WC), hip circumference (HC), waist hip ratio (WHR), serum glucose, serum insulin, blood pressure between obese and non-obese women.

**METHODS:** A total of 69 obese and 80 non-obese women were included in the study. Estimation of levels of fasting insulin, lipid profile, and orexin 5 ml blood was done. Anthropometric measurements including neck circumference, waist circumference, waist hip ratio, were measured.

**RESULTS:** The levels of orexin in obese women (49.85±13.39) was found to be lower than the levels (55.35 ± 14.87)p<0.01 found in lean women. Metabolic risk markers including the results of lipid profile showed some significant results like Total Cholesterol p<0.001, Triglyceride p<0.001, HDL p<0.001, VLDL p<0.001, LDL p<0.002, WHR p<0.01 and HC p=0.1004 yielding significant value.

**CONCLUSION:** We concluded that Orexin levels are in an inverse relationship with Metabolic risk markers, the established one's like increased BP, cholesterol and the new ones like NC, WC. Orexin levels are lower in obese individuals and low Orexin levels warrant a risk for Metabolic Syndrome due to elevated values of metabolic risk markers. Yet a clear and consistent mechanism underplaying the relation of orexin and Metabolic Syndrome is unclear and calls for a more vigorous research approach.

**HG03OP**

**THE ACUTE EFFECTS OF A SINGLE BOUT OF MODERATE-INTENSITY AEROBIC EXERCISE ON COGNITIVE FUNCTIONS IN HEALTHY ADULT MALES.**

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**OBJECTIVES:** To study the acute effects of aerobic exercise on different cognitive functions in healthy young individuals.

**METHODS:** A homogeneous group of 10 right handed healthy adult males participated in the study. Participants were subjected to a total of 8 cognitive function tests including 2 tests from each category (memory, reasoning, concentration and planning) using a pre-validated web based tool, which was recorded as basal values following which all the subjects performed 30 minutes of cycling on a stationary bicycle ergometer at moderate intensity (60-70% of HRR). After rest, they were re-tested when the heart rate returned to within 10% of baseline.
RESULTS: There was an overall improvement in the scores in 7 out of 8 tests, with significant improvement in tests of Memory, Reasoning and Planning. The scores in any of the tests of Concentration did not show significant improvement. The Posttest time was also significantly less than the Pretest time.

CONCLUSION: A single bout of moderate aerobic exercise for as less as 30 minutes can improve some aspects of cognition, most prominent for memory and reasoning.

HG04OP

EFFECT OF RED BULL ENERGY DRINK ON AUDITORY REACTION TIME AND MAXIMAL VOLUNTARY CONTRACTION

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OBJECTIVES: Energy drinks (ED) are a fast growing trend among students aiming at fitness to rejuvenate especially before an academic activity like exam. The most common ingredient in EDs is caffeine and a popular ED available and commonly used is Red Bull, containing 80 mg of caffeine in 250ml. The primary aim was to investigate the effects of Red Bull energy drink on Auditory reaction time and Maximal voluntary contraction.

METHODS: A homogeneous group containing twenty medical students (10 males, 10 females) participated in a crossover study in which they were randomized to supplement with Red Bull (2 mg/Kg body weight of caffeine) or isoenergetic isovolumetric noncaffeinated control drink (combination of Appy Fizz, Cranberry juice and soda) separated by 7 days. Maximal voluntary contraction (MVC, the highest isometric force generated from the dominant hand) and Auditory reaction time (ART, average time interval between the click sound and response) were recorded using BIOPAC systems.

RESULTS: The energy and control drinks after one hour of consumption significantly reduced the ART in males (ED 232±59 Vs 204±34 s and Control 223±57 Vs 210±51 s; p<0.05) as well as in females (ED 227±56 Vs 214±48 s and Control 224±45 Vs 215±36 s; p<0.05) but had no effect on MVC in either sex.

CONCLUSION: Both the drinks significantly improve the reaction time but have no effect on muscular performance. Energy drink per se is no better than control drink, which may indicate that there is no role of caffeine in the beneficial effect seen after the drinks.

KEYWORDS: Caffeine, Energy Drink, Reaction Time

HG05OP

AN ASSEMENT OF RISK FACTORS FOR CONGENITAL HEART DISEASES IN CHILDREN OF AGE GROUP 0-10 YEARS- A CASE CONTROL STUDY

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OBJECTIVES: Congenital heart diseases affect approx. 6–8 infants per 1000 live births and have multifactorial origin. Various studies have shown that there are a number of
maternal (e.g. consanguinity, febrile illness, co-morbidities like gestational diabetes or hypertension) and fetal factors (prematurity, LBW, chromosomal abnormality) contribute to the development of CHDs. The aim of this study is to evaluate the role of various maternal, fetal and environmental risk factors in causation of congenital heart diseases in children up to 10 years of age in India.

**METHODS:** It was a case control study conducted at a tertiary care hospital from Mar 2012 to Aug 2012. A total of 75 diagnosed cases of congenital heart diseases (CHDs) and equal number of matched controls were included in the study.

**RESULTS:** The mean age of cases was 1.70±1.72 years and that of controls was 1.63±1.90 years. Male to female ratio amongst cases was 1.5:1 while amongst controls was 1.7:1. VSD was the commonest cardiac anomaly found in 37 (49.33%) cases. Out of 75 cases 26 (35%) were born of consanguineous marriage while in controls 8 (11%) were born as a result of consanguineous marriage. On analysis consanguinity emerged as a risk factor with odds ratio 4.44 (95% C.I= 1.75 to 12.24). Odds ratio for family history of heart disease was 4.10 (95% C.I. = 1.34 to 14.97), for febrile illness was 3.27 (95% C.I =1.34 to 8.01).

**CONCLUSION:** Our study showed that factors like consanguinity, family history of heart disease, maternal factors like febrile illness during pregnancy, associated comorbidities and fetal factors like preterm, low birth weight were significant underlying risk factors for congenital heart diseases in children up to 10 years of age in India.

**KEYWORDS:** Congenital heart disease (CHDs), consanguinity, preterm, low birth weight.

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**HG06OP**

**TO EVALUATE THE CORRELATION OF ACYL STIMULATING PROTEIN (ASP) WITH LIPID PROFILE IN OBESE FEMALE**

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**OBJECTIVES:** The present study was conducted to evaluate the correlation of Acyl stimulating protein (ASP) with lipid profile in obese female.

**METHODS:** It was a Case control study and total of 110 obese and 105 non-obese control women were included in the study. Total 6 ml of blood was drawn from each volunteer under aseptic conditions. For the estimation of glucose, 1 ml blood was collected in fluoride vials and plasma was separated and stored at 40C. For the estimation of Fasting insulin, lipid profile, and ASP 5 ml blood was collected in vials and plasma/serum was separated and stored at -200C.

**RESULTS:** The present study indicates clearly a positive correlation between plasma ASP level with lipid profile in obese female. ASP levels were substantially higher in obese female (28.19±3.14) than in lean women (17.35±1.87) p<0.0001. On analysis of lipid profile in subjects significant results were obtained in case of Triglyceride (TG) (p=0.0002), Total Cholesterol (TC) (p=0.0001), High density lipoprotein (HDL) (p<0.0001) and Very low density lipoprotein (VLDL), Low density lipoprotein (LDL) (p=0.0002). On further dividing these subjects in relation to Waist hip ratio (WHR) we obtained significant high value, however it was not consistent with body mass index (BMI).
CONCLUSION: Although the present study explores the relationship between ASP and lipid profile in obese female, the exact mechanism and tissue-specific interaction needs to be examined in much greater detail in future studies which may serve as an object for future ASP targeted therapeutic intervention.

FREE COMMUNICATIONS

CM01OP

AMELIORATION OF ADJUVANT INDUCED ARTHRITIS BY LATEX PROTEINS (LP) OF CALOTROPIS PROCERA VIA SUPPRESSION OF INFLAMMATORY MEDIATORS AND OXIDATIVE STRESS.
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OBJECTIVE: Present study was aimed to investigate the effect of latex proteins (LP) of C. procera on the release of inflammatory mediators and oxidative stress caused by adjuvant induced arthritis in Wistar rats.

METHODS: Arthritis was induced by injecting 0.1 ml of 0.1 % of FCA into the intra-articular space of left ankle joint. The LP (5 & 25 mg/kg) and diclofenac (5 mg/kg) were administered 30 min and one hr before injecting the FCA. The animals were sacrificed on day 4 and joint was dissected out to measure the levels of tumour necrosis factor-α (TNF-α), prostaglandin E_2 (PGE_2), nitric oxide (NO), myeloperoxidase (MPO) and parameters of oxidative stress namely superoxide dismutase (SOD), catalase (CAT).

RESULTS: Injection of FCA increased the level of inflammatory mediators TNF-α, PGE_2, NO, MPO and decreased the level of oxidative stress markers SOD and CAT. Treatment with LP showed a dose-dependent normalization of the levels of inflammatory mediators and oxidative stress markers at 5 and 25 mg/kg doses and the effect was comparable to the standard anti-inflammatory drug diclofenac.

CONCLUSION: The results of this study show that LP ameliorates joint inflammation by inhibiting the release of mediators and by maintaining oxidative homeostasis.

CA01OP

EFFECT OF 61 POINT RELAXATION THERAPY AND ANULOMA-VILOMA PRANAYAM IN PREMENSTRUAL SYNDROME.
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OBJECTIVES: The present study was planned to investigate the effects of 61 Point relaxation and Anuloma-viloma pranayam in Premenstrual syndrome (PMS).

METHODS: On the basis of a premenstrual distress questionnaire, 60 females suffering
from PMS, having regular menstrual cycles from 28-34 days, between the age group of 18-40 years were selected from the students and staff members of Swami Vivekananda Subharti University campus. The subjects were divided into 3 groups- group A (61 Point relaxation therapy), group B (Anuloma-viloma) and group C (no intervention).

A baseline record of the systolic blood pressure (SBP; mmHg) and diastolic blood pressure (DBP; mmHg) from the right arm taken using an automated sphygmomanometer (Panasonic Omron). The heart rate (HR/min) and electromyogram (EMG; mV) were recorded simultaneously, on an automated biofeedback apparatus Relax 701. The subjects were instructed to come to the yoga lab daily, empty stomach at 9 am to do the yogic exercises under the guidance of a trained yoga instructor, according to the group assigned to them, regularly for 7 days prior to the onset of menstruation for 3 consecutive menstrual cycles. The parameters were then recorded again at the end of 7 days in each menstrual cycle.

RESULTS : In both the group A and group B, we can see the post relaxation, in the 3rd menstrual cycle, HR, SBP, DBP and EMG showed a very significant reduction (P<0.001) when compared with their basal levels. On comparing groups A, B and C, post-relaxation we saw a very significant difference (P<0.001) between the groups.

CONCLUSION : In the present study the relaxation response in the females suffering from PMS showed a reduction in the abnormally high basal sympathetic activity in both the study groups (group A and group B).

CA02OP

EFFECT OF FAST AND SLOW PRANAYAMA ON COGNITIVE FUNCTIONS AND REACTION TIME IN YOUNG SUBJECTS.

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OBJECTIVES: To compare the cumulative effect of commonly practiced slow and fast pranayama on cognitive functions and reaction time in healthcare students.

METHODS: Study was conducted in the Departments of Physiology and Advanced Centre for Yoga Therapy Education and Research, JIPMER, Pondicherry. After getting written informed consent, 84 healthy subjects pursuing various healthcare courses including medical, nursing and allied medical sciences were randomized to fast pranayama (kapalabhatti, bhasrika and kukkuriya), slow pranayama (nadishodhana, pranav and savitri) and control group. Respective pranayama training was given for 30 minutes three times per week for the duration of 12 weeks under the supervision of certified yoga trainer. Parameters were recorded at the baseline and after 12 weeks of study period: Perceived stress scale (PSS), BMI, waist hip ratio (WHR) & cognitive parameters- Letter cancellation test (LCT), Trail making test A (TTA) & B (TTB), Forward (FDS) & reverse digit span (RDS) and auditory (ART) and visual reaction time for red light (VRT-R) and green light (VRT-G). Recorded data was statistically analyzed.

RESULT: Significant RDS score improvement occurred only in Group 1 subjects whereas, significant improvement in all other tested
cognitive parameters, PSS and reaction time was seen in both Group 1 & Group 2 subjects (p<0.001). Also, percentage reduction in VRT was significantly more in Group 1 subjects when compared to Group 2 subjects.

CA03OP

FUNCTIONAL NEAR INFRARED SPECTROSCOPY DURING HIGH FREQUENCY YOGA BREATHING AND BREATH AWARENESS

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OBJECTIVES: The present study was conducted to assess blood volume, oxygen saturation and carbon dioxide levels in cortical blood vessels before, during and after high frequency yoga breathing (HFYB; kapalabhati) and breath awareness.

METHODS: The participants were 20 male healthy volunteers with ages ranging between 23 and 40 years (group mean ± S.D., 26.45 ± 4.70 years). They all were living in a Yoga and Ayurveda center in the north of India. Their minimum experience of the yoga breathing practice was 3 months with a range between 6 and 36 months (group mean ± S.D., 16.3 ± 9.85 months). Each person was assessed in two sessions i.e., HFYB and breath awareness. Two interventions were given alternatively to each participant. Each session lasted for 33 minutes where the first five minutes was for baseline recording (pre) followed by 15 minutes of practicing either kapalabhati or breath awareness and 10 minutes post recording. Optical topography using a functional near infrared spectroscopy sensor placed over the dorso lateral prefrontal cortex was used for assessment. Data from the sensor on the extreme left and the sensor on the extreme right were analyzed seperately using Repeated Measures Analyses of Variance (ANOVA) followed by post-hoc analyses with Bonferroni adjustment.

RESULTS: There was a significant decrease in oxy-hemoglobin on the right side during HFYB (p<0.01). The increase in oxy-hemoglobin on right side after BAW were significant (p<0.05). There was no significant change in deoxy-hemoglobin during and after HFYB and BAW.

CONCLUSION: Despite reports (elsewhere) of improved performance in attention tasks with HFYB, HFYB does not cause an increase in cerebral blood flow in the dorsolateral prefrontal region.

CA04OP

EFFECTIVENESS OF CONVENTIONAL MEDICAL THERAPY COMBINED WITH YOGA IN THE TREATMENT OF MIGRAINE WITHOUT AURA AND RELATED MOOD DISORDERS.

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OBJECTIVES: Migraine and its related mood disorders are an ever increasing concern in society, especially among youth. Effective long term management of patients with migraine is challenging because of its heterogeneity and complexity of condition. Best therapy against migraine is yet to be
established. Alternative medicine research is still in progress. Combined therapy of conventional medicine and yoga may prove to be effective against migraine.

**METHODS:** A randomized controlled trial design was adopted. This study included 60 patients, with signs and symptoms of migraine. Patients were divided into two groups, with each group having thirty patients. Group-A (treated with conventional medical therapy alone) and group-B, (treated with conventional medical therapy combined with Yoga). Both groups received same medications for six months. The outcome measures were assessed by well established Hospital Anxiety and Depression Scale (HADS), Pittsburgh Sleep Quality Index (PSQI), and Migraine Disability Assessment Test (MIDAS) questionnaires respectively. Student’s t-tests were performed to analyze the data.

**RESULTS:** In this study it has been observed that patients in group B showed a marked significant improvement in migraine status (P<0.001), sleep status (P<0.001), and depression & anxiety status (P<0.001). Mean difference in between pre and post treatment of group B is also much higher as compared to group A.

**CONCLUSION** To conclude the results of the present study suggest that combined medical therapy with yoga is satisfactory in treating migraine and some selective associated mood disorders as compared to conventional medical therapy. However further studies are required to ascertain the beneficial effects of combined conventional and alternative medicine (CAM) in treating migraine.

**EFFECT OF YOG NIDRA ON HEART RATE VARIABILITY**

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**OBJECTIVES:** Yog Nidra is a deeply relaxing guided meditation. The objective of this study was to assess the acute effect of Yog Nidra on Heart Rate Variability (HRV). This would give an idea of the effect of this intervention on cardiac autonomic function.

**METHODS:** The study included 35 healthy subjects, both males and females in the age group 18- 35 years. Detailed history and preliminary medical examination was done to rule out any cardiorespiratory diseases. The baseline Heart Rate (HR) and Lead II Electrocardiogram (ECG) were recorded for 5 minutes using Students Physiopac (Medicaid Company). The subjects were then asked to follow instructions of Yog Nidra. HR and ECG were recorded immediately post Yog Nidra session for 5 minutes. Power spectral analysis of the ECG data was done using software by University of Eastern Finland, Kuopio, to obtain HRV. Cardiac autonomic function was determined using HRV indices in the time domain and frequency domain [Low Frequency (LF) cardiac sympathetic 0.04-0.15 Hz; High Frequency (HF), cardiac parasympathetic 0.15-0.4 Hz].

**RESULTS:** The Yog Nidra relaxation produced significant improvement in HR and HRV indices: R-R, p50 NN, Low Frequency (LF), High Frequency (HF), LF: HF ratio, from the baseline.
CONCLUSION: Yog Nidra produces a favourable shift of the autonomic nervous system to the Parasympathetic Nervous System.

CA06OP

YOGIC TECHNIQUES FOR FILLING THE INTESTINES WITH AIR FOR SATIETY FOR PREVENTION AND TREATMENT OF OBESITY.

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Obesity is perceived as a result of imbalance between calorie consumption and calorie intake. Food intake is largely determined by appetite and its satiety. Satiety is a complex process which involves feedback from the gut afferents, circulating levels of satiety peptides, leptin, pro-inflammatory chemical mediators, and the prevailing psychological state. Of these, the contribution of gut afferents is minor but important.

Balloon distension of the stomach suppresses Ghrelin secretion and stops hunger pangs. According to current understanding, gastric satiety has been said to be mechanical, resulting from distension of the stomach, while the intestinal satiety is said to be chemical, resulting from composition of intestinal contents. However, there can be some flaws in our understanding of the intestinal satiety.

Intestinal distension may also release satiety signals both neuronal and chemical pathways, through afferent nerve fibres of the autonomic nervous system as well as through release of satiety peptides such as GLP-1.

Some researchers are attempting to develop devises that could be inserted into the intestines and inflated by remote control.

Yogic texts describe some techniques to fill the intestines with air. Although available in the texts, due to unavailability of diagrams and more so due to the policy of yoga gurus to keep the techniques a closely guarded secret, the technique appears to have been lost in transit through several generations of gurus and disciples. Air is first sucked into the stomach and then posturally maneuvered into the intestines. This maneuvering requires repeated assumption of upright and inverted positions, and a whole series of postures has been practiced in India for several centuries. With renewed interest in yogic techniques in the last few decades, efforts have been made to interpret the yogic techniques and their effects in view of modern understanding of physiology, and it is here that a serious error has occurred. Suryanamaskara which has been interpreted as a form of physical exercise indeed seems to be a series of postures which must have been designed to fill the intestines with air.

Positive role of air in the gastrointestinal tract has been realized by ancient yogis. Viewed in the light of modern knowledge, Intestinal distension with air also reduces hunger pangs and one can tolerate abstinence from food much better. Thus this and a modified technique (To be discussed in the lecture) can help obese people abstain from food without feeling the usual distress.

In addition, air in the gut may help eradicate anaerobic infections of the gut such as Helicobacter pylori and Entamoeba histolytica infections.
CA07OP

EFFECT OF YOGA TRAINING ON CARDIO-RESPIRATORY FUNCTIONS OF NORMAL YOUNG VOLUNTEERS.

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OBJECTIVES: Yoga has a sound scientific basis and is an ideal and holistic tool for improving total health of our masses. To further evaluate the effectiveness of yogic techniques, the present work was planned to study the effect of yoga training on cardio-respiratory functions of normal young volunteers.

METHODS: 15 healthy males (18-20 years) volunteers were given 10 weeks of yoga training that included asanas (including shavasan) and pranayams. Blood pressure, heart rate and respiratory parameters were recorded before and after 10 weeks of yoga training.

RESULTS: Yoga training produced a significant decrease in resting blood pressure, heart rate and rate-pressure product, indicating a reduction in load on the heart. This supports the view that yoga has a cardio-protective role. Yoga training produced a significant increase in respiratory pressures and 40 mmHg endurance indicating that yoga training improves the strength of expiratory as well as inspiratory muscles and cardio-respiratory endurance. Breath holding times also increased significantly after yoga training.

CV01OP

IMPROVEMENT IN CENTRAL ARTERIAL STIFFNESS PRECEDES THE NORMALISATION OF BAROREFLEX SENSITIVITY IN RENAL TRANSPLANT PATIENTS.

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OBJECTIVES: In end stage renal disease (ESRD) patients the most common cause of mortality and morbidity are cardiovascular events. This could be attributed to the impaired baroreflex function in ESRD patients and it may be altered by renal transplantation. Therefore, we investigated baroreflex sensitivity (BRS) and its relation to central arterial compliance in ESRD patients before and after transplantation in order to decipher the underlying mechanism of attenuated BRS in ESRD patients.

METHODS: We studied 23 ESRD patients (mean age; 36 yrs) prospectively before and 3 and 6 months after renal transplantation. BRS was determined by spontaneous method (sequence and spectral indices). Arterial stiffness indices were assessed by augmentation index (AI) and central pulse pressure.

RESULTS: Renal transplantation was associated with the normalisation of BRS by 6 months (baseline - 6.7±3.1 ms/mmHg to 11.4±7.9 ms/mmHg; p=0.0017). Arterial stiffness indices - AI (baseline - 27.7±11.3 % to 17.1±9.0%; p<0.0001) and central pulse
pressure (baseline - 41.7±13.9 mmHg to 33.0±11.1 mmHg; p=0.0049) had a significant reduction as early as 3 months after renal transplantation.

**CONCLUSIONS:** Our data suggests that renal transplantation normalises baroreflex sensitivity in end stage renal disease patients by 6 months probably due to the improvement in the central arterial stiffness.

**CV02OP**

**ACUTE TOXICITY OF BISPHENOL A IN RATS.**

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**OBJECTIVE:** Bisphenol A (BPA), an estrogenic compound, is used in manufacturing plastics. BPA is known to produce toxic effects on various systems in man and animals. Since the use of plastics in our daily life is increasing, exposure to BPA will also increase. Therefore, this study was undertaken to determine the median lethal dose (LD50) of BPA via intraperitoneal and intravenous route in rats and also to know the acute systemic changes produced by lethal dose of BPA.

**METHODS:** Adult female albino rats of Charles Foster strain were used for the study. LD50 by intraperitoneal and intravenous route were estimated by using Dixon's Up and Down method. In addition, the effect of BPA on blood pressure, respiration and ECG were recorded.

**RESULTS:** The results showed that LD50 of BPA was 841 and 35.26 mg/kg body weight for i.p. and i.v. route respectively. Injection of lethal dose of BPA (40 mg/kg body weight) produced acute toxicity. The toxicity is manifested as immediate respiratory arrest and hypotension after the injection of BPA followed by bradycardia. The animals died within 7.3 ± 0.7 min. Vehicle (ethanol) present in the lethal dose of BPA was not lethal and had no effect on respiration, blood pressure and heart rate.

**CONCLUSION:** The results provide evidence that the acute exposure to BPA produces lethality with a very narrow range of lethal and survival dose for i.v. route. Further, the lethality appears to be due to respiratory arrest and hypotension.

**CV03OP**

**OXIDATIVE STRESS AND BAROREFLEX FUNCTION IN N^6-NITRO-L-ARGININE METHYL ESTER TREATED HYPERTENSIVE RATS – ROLE OF SYMPATHETIC NERVOUS SYSTEM.**

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**OBJECTIVES:** Oxidative stress induced disturbances of autonomic function are well recognized in hypertension. However, the underlying mechanisms are not completely understood. We hypothesize that these alterations depend on sympathetic overactivity known to characterize hypertension. To test this hypothesis, the present study investigated the effect of
sympathetic nervous system on baroreflex sensitivity and serum malondialdehyde (MDA), a marker of oxidative stress in chronic N^G- nitro- L- arginine methyl ester (L-NAME; 50 mg/kg per day for 7 days, orally through gavage) treated adult male Wistar rats.

**METHODS:** A subtractive approach of chemical sympathectomy by 6-hydroxydopamine (100mg/kg, i.p. twice in a week) was used to study the influence of sympathetic nervous system. Animals were divided into four groups (n=10): Control, L-NAME treated rats, Sympathectomised rats, L-NAME treated sympathetomised rats.

**RESULTS:** Results showed a significant rise in blood pressure and tachycardia after long term L-NAME treatment. Besides this, a marked suppression of baroreflex responses and a significant increase in serum MDA was observed in chronic L-NAME treated animals. Sympathectomy not only reduced the pressor response but also normalised the reduced baroreflex sensitivity observed after long term L-NAME treatment. The increase in serum MDA also reverted to normal after removal of sympathetic influence in L-NAME treated rats.

**CONCLUSION:** We therefore conclude that suppression of baroreflex responses and increase in oxidative stress following long term L-NAME treatment is mediated by enhanced sympathetic outflow.

**CV04OP**

**EVALUATION OF HEART RATE VARIABILITY DURING DEEP BREATHING IN NEWLY DIAGNOSED UNCOMPLICATED HYPERTENSIVE SUBJECTS AGAINST MATCHED CONTROLS.**


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**OBJECTIVES:** To evaluate heart-rate-variability during deep breathing(HRVdb) in newly diagnosed uncomplicated hypertensive subjects, compare it with normotensive controls and to find out any association with body mass index(BMI) and lipid profile.

**METHODS:** A cross-sectional observational study was conducted in Physiology department R. G. Kar Medical College & Hospital, Kolkata (January2011-July2012). From 356 randomly selected subjects, 40 were diagnosed as uncomplicated hypertensive patients, taken as cases from the Medicine OPD. Age and sex matched 40 apparently healthy normotensive subjects were taken as control. Each subject was undergone history taking, clinical examination and special investigations [Na^+ ,K^+,Ca^{++}, urea, creatinine lipid profile, and deep breathing test for HRV]. Data analysis was done by independent student-t test, Pearson’s bivariate correlations using SPSSversion-17.

**RESULTS:** Heart rate variability(HRVdb) is significantly(p=0.001) lower in cases(27±5) compared to controls(mean=33±4) but no significant differences in serum electrolytes(Na^+,K^+,Ca^{++}) and urea, creatinine are found. HRVdb shows significant negative correlation with BMI(r=-0.4, p=0.01). Though HRVdb shows no correlation with total Cholesterol (r= +0.28, p=0.08), LDL(r=+0.114,p=0.482) but has a significant
positive correlation with HDL(r=+0.42,p=0.007).

CONCLUSION: Our study shows that new-onset-hypertension is characterised by diminished heart rate variability which has significant correlation with BMI and HDL-C. So our findings are consistent with the hypothesis that autonomic dysregulation is present in the early stage of hypertension. HDL-c has an independent protective effect on arterial stiffness. So whether cardiac autonomic function associates with arterial stiffness in the early stage of newly diagnosed hypertension has to be confirmed by further prospective study with larger sample.

CV05OP

CORRELATIVE STUDY OF IOP AND BMI AMONGST NORMOTENSIVE, PRE-HYPERTENSIVE AND HYPERTENSIVE ADULTS.

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OBJECTIVES: To study the correlation between IOP and BMI amongst normotensive, pre-hypertensive and hypertensive adults.

METHODS: The study included 180 adult subjects (>40 years of age) selected from population of north India. The subjects were divided into three groups (n=60) normotentensive (BP <120/<80 mmHg), pre-hypertensive( BP 120-139/80-89mm Hg) and hypertensive (BP >140/>90mm Hg). Complete ocular examination including visual acuity, anterior segment examination fundus examination and IOP measurement was done for each patient. IOP measurement was done using Goldmann Applanation tonometer after instilling local anaesthetic drops . The BP was measured for each patient in sitting position over right arm. After ensuring subject for 10 minutes of restful condition. BMI was calculated using Quetelet's index ie weight in kg/(height in m)² .The correlation of IOP and BMI with BP was studied in the three groups. The statistical analysis was done using SPSS applying Pearson's correlation.

RESULTS: The mean IOP and BMI of normotensive group were 13.8 mm Hg and 20.89 kg/m². The mean IOP was 15.12 mm of Hg and BMI was 22.95 kg/m² in pre-hypertensive group. In hypertensive group mean IOP was 18.0 mm of Hg and mean BMI was 27.08 kg/m². The difference was found to be statically significant. (p<0.01)

CONCLUSION: In view of positive correlation of IOP and BMI with BP it could be concluded that hypertension and obesity are amongst other possible risk factors for ocular hypertension. Also obesity seems to be independent risk factor for systemic hypertension and ocular hypertension. Ocular hypertension can lead to glaucoma which is a leading cause of blindness in India and worldwide. Thus subjects high BP and high BMI warrants screening for IOP and also visa versa

CV06OP

ALOE VERA (ALOE BARBADENSIS) GEL EXTRACT MODULATE REPOLARIZATION STATE OF MYOCARDIUM IN ALBINO RATS.

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OBJECTIVES: Various nutritional plants and vegetables exert cardio protective effect, reduce genotoxicity and have no toxicity to animals. Since aloe-vera has been claiming to be useful in various pathological conditions hence it is very necessary to rule out the toxicity of aloe barbadensis. QTc prolongation represents the re-polarization abnormalities involving slowly activating potassium channel. Therefore, in present study we investigated the effect of aloe vera on re-polarization state of myocardium of albino rats.

METHODS: A total of 24 male albino rats were divided in to four groups, one control and three experimental of 6 animals each. Animals of all the groups were anesthetized and secured on animal operation table for ECG recording. Animal of experimental groups were treated (i.p.) with aloe vera gel extract in doses of 100mg, 200mg and 300mg/kg body weight to experimental group-I, group-II and group-III respectively. Electrocardiograms were recorded at 0 (basal), 15 min and 30 min after injection of aloe vera/ saline.

RESULTS: The aloe vera gel in concentration of 100mg/kg body weight does not causes significant changes in QTc. While in doses of 200mg QTc increases from 73.10± 3.25 (mv) to 75.04±1.93 (mV) and in 300mg QTc increased from 72.10± 1.85 to 76.10±1.56 which is statistically significant (p<0.05). Therefore in high doses aloe vera may be cardio toxic.

CONCLUSION: As reported in previous studies we have also reported a poor HRV

OBJECTIVES: To assess heart rate variability as a measure of effect of chemical irritants in patients of depression and anxiety disorders.

METHODS: HRV was studied in 33 patients of depression/anxiety and was compared with 37 age matched controls. These patients were further studied for use of odoriferous substances

RESULTS: The time domain parameter NN50 shows a significant difference between cases and control group (p<0.05).The frequency domain parameters did not show any significant difference. However , the HF values which indicate the parasympathetic control of heart rate showed higher values in the control group compared to the cases .The LF/HF ratio which showed higher values in the cases indicates greater sympathovagal control in the patients of depression/anxiety.

While seeing the HRV parameters in patients with h/o odorous substances there was no significant difference but there were higher trends in almost all the time domain measures which reflect the vagal control in cases which do not have any h/o odorous substances.

CONCLUSION: As reported in previous studies we have also reported a poor HRV
compared to control group in patients of depression/anxiety as reflected by NN50 values (p< 0.05 ). Although not significant but trends show a better HRV control in almost all the time domain and frequency domain parameters in controls compared to cases. The values were perhaps not statistically significant because all patients were on medication. Regarding the h/o use of chemical irritants again trends showed a poor HRV control in these cases compared to cases which did not give any such history.

CV08OP

EFFECT OF MENTAL IMAGERY OF MOTOR ACTIVITY ON PULSE VOLUME AMPLITUDE.

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OBJECTIVES: Feed-forward activation of sympathetic nervous system is expected to occur during voluntary motor activity. The present study was designed to evaluate the effect of mental imagery of motor activity on peripheral vasculature in comparison with actual motor activity.

METHODS: Fourteen healthy subjects were asked to alternatively either perform voluntary motor activity (Actual Contraction; AC) by pressing hand-grip dynamometer with maximum force or were asked to visualize the act of performing voluntary contraction (Mental imagery of Contraction; MIC) without actually contracting the muscle. The EMG was recorded to ensure the compliance. The effect on vasculature in the terms of ‘pulse volume amplitude’ was evaluated from the photoplethysmographic (PPG) record taken from finger of the contralateral hand. The decrease in pulse volume amplitude of the PPG wave was taken as measure of sympathetic stimulation.

RESULTS: The volume pulse amplitude decreased significantly during the actual contraction (283.5 mv ± 107 to 109.7 mv ± 60.1; decrease of 61.22 %) as well as during the mental imagery (283.5 mv ± 107 to 180.3 mv ± 113.3; decrease of 36.85 %). The % decrease was significantly (p < 0.001) different in the two conditions.

CONCLUSION: The mental imagery of voluntary motor activity is sufficient to initiate sympathetic drive to vasculature in a feed-forward mechanism without the actual performance of the activity. Pulse amplitude during mental imagery of contraction is only 24.37 % less than AC.

CV10OP

EFFECT OF L-ARGININE ON ELECTRO-CARDIOGRAPHIC CHANGES INDUCED BY HYPERCHOLESTEROLEMIA AND ISO-PROTERENOL IN RABBITS

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OBJECTIVES: Hypercholesterolemia, a well-known cardiovascular risk factor, is associated with prolonged action potential duration, longer QTc intervals (rate controlled QT interval), suggested that Hypercholesterolemia may have a direct effect on ventricular repolarization. The role
of L-arginine in hypercholesterolemia induced long QT interval and repolarization related abnormality is yet to be endeavored. Therefore in present study we evaluated the effect of oral administration of L-arginine on hypercholesterolemia as well as isoproterenol induced arrhythmic changes in rabbits.

**METHODS:** Hypercholesterolemia was induced in rabbits and L-arginine was given orally to animals for sixteen weeks. The isoproterenol was injected in all the animals to produce electrocardiographic changes. ECG was recorded in lead II at start of study, after hypercholesterolemic diet and/or L-arginine supplementation.

**RESULTS:** It is observed that L-arginine significantly reduced the hypercholesterolemia induced QTc prolongation. Isoproterenol induced increase in QTc intervals were decreased only in normolipidemic animals. No significant changes were observed in QRS complex and heart rate.

**CONCLUSION:** Our result suggests that L-arginine modulate the repolarization processes of myocardium.

**CV11OP**

**OBJECTIVES:** To study effect of 2:1 yogic breathing technique on cardiorespiratory and autonomic parameters in patients of essential hypertension In 2:1 breathing, exhalation is twice of inhalation.

**METHODS:** 30 patients of essential hypertension between the age group of 20-50 years were selected. After a rest of 15-20 minutes in a comfortable sitting posture their baseline physiological parameters recorded on a digital polygraph were, Electromyogram (EMG), Galvanic skin response(GSR), Fingertip temperature(FTT), Heart rate(HR) and Respiratory rate(RR). Systolic blood pressure (SBP) and diastolic blood pressure (DBP) were recorded by automated digital Sphygmomanometer. Then they were guided to do 2:1 breathing maintaining respiratory rate of around 6/min. Subjects were then instructed to do 2:1 breathing twice a day for 5-7 minutes for next 3 months. Subjects reported back weekly for recording of BP. The physiological parameters of the subjects were assessed again by polygraph at the end of three months of practicing 2:1 yogic breathing.

**RESULTS:** The mean fall of SBP over 12 weeks was 12 mm Hg (8%) and DBP was 7 mm Hg (7%), p value < 0.001 in both. After practicing 2:1 breathing for 3 months there was statistically significant reduction of SBP, DBP, HR, RR, EMG, GSR and rise in FTT.

**CONCLUSION:** The study showed that 2:1 breathing technique caused a comprehensive change in body physiology by altering various parameters that are governed by the autonomic nervous system. It is an effective modality for management of essential hypertension.

**CV12OP**
HEART RATE VARIABILITY DURING EXAMINATION STRESS.

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OBJECTIVES: Stress has been investigated as a risk factor for cardiovascular disease and for reduced human performances. This study investigates the variations of Heart Rate Variability (HRV) due to a real-life situation of examination stress. It is a known stressor in examination going students.

METHODS: Sixteen first year MBBS students were selected randomly to participate in the study to know heart rate variability (HRV) during the examination period. After noting all the anthropometric parameters, three recordings were performed for each student: the first assessment was done during college cultural week and it served as control, the second reading was taken on the day of their IIInd terminal viva voce examination and the final reading was taken on the viva voce examination during professional examination. Nonlinear analysis of HRV was performed by using Poincare Plot. For statistical analysis paired student’s t-test was used.

RESULTS: Almost all HRV features measuring heart rate complexity were significantly decreased in the stress session. Mean heart rate in controls, before term viva & before professional viva is 78.20±11.3, 85.51± 11.65 and 88.09±12.79 respectively. LF/HF ratio in the three groups is 2.75±1.17, 3.22±1.95 and 3.60±1.19.

CONCLUSIONS: The results indicate an increase in HRV during periods of stress. It is also established that non parametric HRV analysis using short term ECG recording could be effective in detecting real-life stressful conditions.

KEYWORDS: Heart Rate Variability, real-life stress.

CV13OP

NON INVASIVE STUDY ON ARTERIAL STIFFNESS IN NORMOTENSIVE AND HYPERTENSIVE HEALTHY SUBJECTS: A COMPARATIVE STUDY.

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OBJECTIVES: Both peripheral and central arteries, depending on age and disease, have various contributions of elastic and non elastic fiber, which give the arterial walls strength and flexibility (3-6). As the elastic fiber deteriorate secondary to aging and disease processes, they are replaced by non elastic element, the arteries become stiffer, even they lose more of their ability to expand. The present study investigates the differences on arterial stiffness (Right and left brachial arterial stiffness and right and left ankle arterial stiffness) and ankle brachial index at both right and left between normotensive and hypertensive healthy male subjects.

METHODS: Twenty two healthy nonsmoking male subjects of normotensive and hypertensive were taken for the study who were not involved in taking regular physical exercise (aged 25-35 years) with no significant variation on body weight. The PC based cardiovascular analyzer (PERISCOPE) was used for the study. All the data was measured while subjects in lying down
position. Arterial Stiffness (Right and left brachial arterial stiffness and Right and left ankle arterial stiffness) and ankle brachial index at both right and left between normotensive and hypertensive healthy male subjects were recorded using PERISCOPE after taking body weight, history of the subjects. All were considered from same socio-economic status.

**RESULTS:** Arterial stiffness (Right and left brachial arterial stiffness and Right and left ankle arterial stiffness) and ankle brachial index at both right and left in hypertensive healthy male subjects, were increased significantly as compared to normotensive individuals.

**CV15OP**

**COMPARISON OF ARTERIAL STIFFNESS AND HEART RATE VARIABILITY IN CHRONIC KIDNEY DISEASE PATIENTS WITH OR WITHOUT PERITONEAL DIALYSIS.**


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**OBJECTIVES:** Chronic kidney disease patients on peritoneal dialysis (CKD-PD) seem to have worse cardiovascular profile compared to chronic kidney disease (CKD) patients not on peritoneal dialysis. This study was done to compare the pulse wave velocity (PWV) and heart rate variability (HRV) of CKD-PD (CKD stage-5 on continuous ambulatory peritoneal dialysis since more than 3 months), CKD stage 4-5 and normal healthy subjects.

**METHODS:** Age and sex matched 21 patients each of CKD-PD and CKD along with 25 normal healthy controls were recruited. Carotid to femoral Pulse wave velocity (c-f PWV) was measured to assess arterial stiffness. RMSSD (time domain) and Total Power (frequency domain) were used as measures of HRV.

**RESULTS:** PWV of CKD-PD patients (10.75 m/s; interquartile range, IR 8.28-13.23) was significantly higher (p < 0.05) compared to both CKD (8.30 m/s, IR 6.95-9.25) and normal healthy subjects (7.20 m/s, IR 6.15-8.55)

CKD-PD patients showed depressed RMSSD (18.85 ms, IR- 6.5-21) compared to CKD patients (22.19 ms, IR 10.14-66.22) and normal healthy subjects (27.10 ms, IR 17.19 -35.16). Total power of HRV in CKD-PD patients (325.5 ms; IR- 57-1076) was significantly low compared to CKD (513ms; IR 232-3042) and normal healthy subjects (966 ms; IR 567-1729).

**Conclusion** – Increased PWV in CKD-PD patients as compared to CKD and healthy population shows that CKD-PD is associated with stiffer arteries probably due to abnormal endothelial-dependent vasomotor function. Depressed HRV parameters indicate adverse effect of peritoneal dialysis on cardiac autonomic tone in CKD-PD patients.

**CV16OP**

**CARDIOVASCULAR RESPONSE TO SUSTAINED HAND GRIP IN HEALTHY YOUNG ADULTS AND ITS RELATION WITH FAT FREE MASS INDEX.**

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**OBJECTIVES:** The study was taken up with an objective to find out the cardiovascular changes during sustained hand grip (SHG) and their relation with body fat percentage (BF%) and fat free mass index (FFMI).

**METHODS:** The study included 50 young healthy adults (male and female) of age group 17 to 25 yrs. Their height, weight were measured and body fat percentage was calculated by OMRON Body Fat Monitor. The basal heart rate, Blood pressure were recorded by Clarity Med Cardiac Monitor. They were subjected to hand grip at 30% maximum voluntary contraction (MVC) for 3 min by hand grip dynamometer. All the parameters were recorded at the end of 3 mins. and 5 mins.

**RESULTS:** Heart rate showed no correlation with BMI, FFM and FFMI. Mean Arterial Pressure (MAP) showed significant correlation with FFM and FFMI but it was insignificant with BMI.

**CONCLUSION:** From our study we found that FFM and FFMI showed better correlation than BMI with MAP.

**CV17OP**

**INFLAMMATORY RISK MARKERS IN UNTREATED ESSENTIAL HYPERTENSION.**

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**OBJECTIVES:** To explore the relationship between markers of inflammation with Essential Hypertension.

**METHODS:** The study was planned and conducted at GSL Medical College and General Hospital, Rajahmundry, Cardiac Care hospital, Ahmedabad. Predefined inclusion and exclusion criteria were set for selection of the study group. Plasma levels of inflammatory markers were measured by ELISA technique. Left ventricular dimension, Carotid Intima-Media Thickness & diastolic function were assessed by 2D & Color Doppler Echocardiography. Data were analyzed using SPSS package.

**RESULTS:** We studied untreated hypertensive patients (n=78; 62% male; 48 ± 2.8 years of age; mean ± SEM). Total peripheral resistance was significantly related to plasma high-sensitivity C-reactive protein (r=0.31; P<0.001), TNF-, (r=0.30; P<0.001) and IL-6 (r=0.21; P<0.05). High-sensitivity C-reactive protein, a marker of systemic inflammation, is independently related to total peripheral resistance a marker of aortic stiffness in essential hypertension.

**CONCLUSION:** The use of novel inflammatory markers may significantly add to our ability to correctly identify patients presenting with hypertension and other cardiovascular disease who are at high risk for future cardiovascular events. Individuals with evidence of heightened inflammation may benefit most from an aggressive modification of lifestyle and an intensification of proven preventive therapies such as aspirin and statins.

**CV18OP**

**CORRELATION BETWEEN BODY MASS INDEX (BMI) AND BLOOD PRESSURE (BP)**
IN UNDERWEIGHT, NORMAL AND OVERWEIGHT ADOLESCENTS.

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OBJECTIVES: Population studies show that obesity predicts future development of hypertension, and the relationship between body mass index and blood pressure (BP) appears to be linear throughout the world. Our aim was to study the correlation between body mass index and blood pressure indices in first year medical students of Rural Medical College, Loni.

METHODS: A total of 235 healthy subjects with an age group of 17-20 years, grouped into underweight, normal weight, overweight and obese were selected for the study. Height and weight were measured using steel tape and weighing machine respectively and was used for calculating body mass index. BP was measured with the help of stethoscope and sphygmomanometer.

RESULTS: BMI, Systolic and Diastolic BP were normal in normal subjects but low in underweight subjects. High blood pressure in overweight and obese were seen in both males and females.

CONCLUSION: From our study, we advised underweight students to improve nutritional status by encouraging them to take balanced diet. To undertake regular exercise, modification of life style and dietary habits for overweight and obese students.

ASSESSMENT OF THYROID HORMONE STATUS IN NON DIABETIC NON ALCOHOLIC FATTY LIVER DISEASES

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OBJECTIVES: To find out any association of thyroid dysfunction with nonalcoholic fatty liver disease (NAFLD), correlate it with dyslipidemia and the severity of the disease.

METHODS: A cross sectional observational study was conducted in the Physiology department of R.G.Kar Medical College &Hospital, Kolkata on 41 NAFLD patients, randomly selected from the Radiology department following inclusion-exclusion criteria. Age sex matched alcoholic fatty liver disease patients were taken as control. Each subject were undergone history taking, clinical examination, and investigation [blood sugar, lipid profile, fT4, TSH]. Data were analysed by independent student t-test, chi-square test, pearson and spearman-rank correlation test by using SPSS version 17 (P value <0.05 is significant).

RESULTS: This study has shown that 85% cases have dyslipidemia. Among them 58% have abnormal LDL-cholesterol next to triglyceride(71%). 28.6% patient have subclinical hypothyroidism where as only 14.6% have overt hypothyroidism but that is not significant compared to control. Though fT4 has no significant correlation with lipid profile, TSH has a significant positive correlation with TG (r=0.53, p<0.05) as well as with LDL-C (r=0.86, p=0.0001). Both
fT4(\rho= -0.02) and TSH( \rho= -0.102) have no correlation with the severity of the diseases.

**CONCLUSION:** Our study shows that there is a high association between subclinical hypothyroidism and NAFLD. So thyroid dysfunction may have a potential role in the pathogenesis of NAFLD. Routine screening by thyroid function test to all NAFLD patients may help the therapeutic approaches in the future. Although a prospective study with larger sample size is needed to confirm our findings.

**EN02OP**

**OBESITY AND SERUM C-PEPTIDE LEVEL PRECED THE DEVELOPMENT OF INSULIN RESISTANCE IN OFFSPRINGS OF TYPE 2 DIABETIC PARENTS.**

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**OBJECTIVES:** Individuals with insulin resistant have higher risk of developing type 2 diabetes mellitus. Since insulin resistance tends to run in families. The present study was aimed to evaluating nondiabetic offsprings of diabetic parents on the basis of their serum c-peptide status.

**METHODS:** Insulin resistance was studied in 63 subjects who were divided into three groups- Group I (26 biparental diabetics offsprings), group II (22 monoparental diabetics offsprings) and group III (15 nondiabetic offsprings). Fasting serum C-peptide level was assessed by standard ELISA method in all the subjects.

**RESULTS:** Mean serum C-peptide level was 1.96±0.50, 1.24±0.50 (P<0.01) and 1.05±0.46 ng/ml (P<0.05) in children of biparental, monoparental & nondiabetic subjects respectively.

In offsprings of biparental diabetics, serum C-peptide level were 1.70±0.51 & 2.27±0.27 ng/ml in males & females respectively (P<0.05).

Mean serum C-peptide in normal and high BMI subjects were 1.51±0.36 & 2.28±0.28 ng/ml in biparental offsprings, 0.96±0.13 & 1.84±0.48 ng/ml in monoparental offsprings and 0.85±0.12 & 1.79±0.30 ng/ml in nondiabetic offsprings (P<0.01) and in normal and high waist hip ratio 1.44±3.10 & 2.28±0.26, 0.94±0.14 & 1.84±0.46 and 0.85±0.12 & 1.79±0.32 ng/ml in group I, II & III respectively (P<0.01).

**CONCLUSION:** Mean serum C-peptide levels were significantly higher in female than male offsprings of biparental diabetics & were concomitantly increased with higher BMI indices & WHR in all three groups. Our findings suggested that female childrens of biparental diabetics & obese subjects with central obesity show higher incidence of insulin resistance than the other subjects.

**Keywords:** Diabetic parents, Insulin resistance, Serum C-peptide.

**EN03OP**

**STUDY OF BRAINSTEM AUDITORY EVOKED POTENTIAL IN PATIENTS OF NEWLY DIAGNOSED HYPOTHYROIDISM**
OBJECTIVES: Several studies have documented that thyroid hormone deficiency adversely affect the functional integrity of the auditory pathways in the brainstem in patients of hypothyroidism. Brainstem Auditory evoked potential (BAEP) is known to be one of the most useful method of assessing the auditory pathways in the brainstem.

Our present study aims to detect if there any significant changes occur in the absolute peak latency, interpeak latency and wave amplitudes in the BAEP responses of the newly diagnosed hypothyroid patients.

METHODS: Fifteen newly diagnosed hypothyroid patients in the age group of 20-50 years were taken from the Endocrinology OPD of R.G. Kar Medical College, Kolkata. Fifteen age and sex matched healthy controls were taken from the medical staffs of the same institution. Both cases and controls were selected on the basis of their Serum TSH (N=0.35-6.15) and FT₄(0.8-2.0) level. Subjects suffering from any hearing impairment, systemic diseases or any taking ototoxic drugs and pregnant females were excluded from the study.

BAEP evaluation was done on both the groups using RMS EMG EP MarkI version (i), 2011 instrument at the Department of Physiology, R.G. Kar Medical College, Kolkata.

RESULTS: There was a statistically significant increase (p<0.05) in the I-V interpeak latency and a statistically significant decrease in the amplitude of wave V (p<0.05) in the BAEP study of the hypothyroid patients.

There was also prolongation of the absolute peak latencies of waveII and waveV but they were not statistically significant.

CONCLUSION: Our present study conclude that hypothyroidism may affect peripheral auditory pathway in the brainstem adversely. Further studies are required to confirm the findings.

EN04OP

ASSESSMENT OF BRAINSTEM AUDITORY EVOKED POTENTIAL IN PATIENTS WITH TYPE 2 DIABETES MELLITUS AND ITS CORRELATION WITH GLYCEMIC CONTROL

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OBJECTIVES: To detect the central auditory pathway involvement by assessing Brain Stem Auditory Evoked Potential (BAEP) in patients suffering from type 2 Diabetes Mellitus (DM) for > 5 years. To study the relationship (if any) of auditory function with HbA1c level.

METHODS: 50 diabetic patients aged > 30 years, were selected from Diabetic clinic of R.G. Kar Medical College & Hospital. Age matched apparently healthy 50 controls were taken. The external ears of the subjects were examined with an autoscope and their hearing was tested by RINNE’S & WEBER test. Brainstem Evoked Response Potential (BAEP)
RESULTS: A significant increase in the absolute latencies of wave III (p = 0.026) and wave V (p = 0.039217) and inter-peak latencies (IPL) of wave I-III (p = 0.042041) and wave I-V (p = 0.008284) of the BAEP was observed among cases at 90dB.

Amplitude of wave V also showed a significant decrease (p < 0.05) between diabetic (0.28±0.18) & control group (0.67±0.13). A significant difference (p < 0.05) was observed between control male and female while considering absolute latency of wave III and IPL of wave I-III. Diabetics treated with both insulin and oral hypoglycemic agents (OHA) showed a significant difference in IPL of wave I-III (p = 0.01315) and wave I-V (p = 0.027662) from those treated with OHA only. Further analysis showed a strong positive correlation (r = 0.67) between HbA1c level and absolute latency of wave V.

CONCLUSION: Patients with type 2 DM showed a prolonged latency and decreased amplitude of different waves in BAEP.

EN05OP

CORRELATION OF SERUM PROGESTERONE LEVELS WITH MOTOR NERVE CONDUCTION IN POST-MENOPAUSAL WOMEN WITH PERIPHERAL NEUROPATHY.

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OBJECTIVES: Menopause is a physiological condition characterized by decreased levels of serum estrogen and progesterone. This transition in hormonal status after the onset of menopause is reflected in various systems of the body including the peripheral nervous system. Our aim is to find the correlation between the motor nerve conduction velocity and the serum progesterone levels in post-menopausal women.

METHODS: Motor nerve conduction velocity and serum progesterone estimation was done in 30 post-menopausal women with peripheral neuropathy, and 30 post-menopausal women without peripheral neuropathy.

RESULTS: A positive correlation was observed between motor nerve conduction velocity and the serum progesterone levels in the post-menopausal women.

CONCLUSION: The study demonstrates that there is a positive correlation between the serum progesterone levels and the motor nerve conduction velocity, suggesting the role of decreased progesterone levels of menopause as a contributing factor in the increased incidence of peripheral neuropathy in post-menopausal women.

EN06OP

Nerve Conduction Study in Diabetic Neuropathy: A Hospital-Based Cross-Sectional Study.

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OBJECTIONS: Menopause is a physiological condition characterized by decreased levels of serum estrogen and progesterone. This transition in hormonal status after the onset of menopause is reflected in various systems of the body including the peripheral nervous system. Our aim is to find the correlation between the motor nerve conduction velocity and the serum progesterone levels in post-menopausal women.

METHODS: Motor nerve conduction velocity and serum progesterone estimation was done in 30 post-menopausal women with peripheral neuropathy, and 30 post-menopausal women without peripheral neuropathy.

RESULTS: A positive correlation was observed between motor nerve conduction velocity and the serum progesterone levels in the post-menopausal women.

CONCLUSION: The study demonstrates that there is a positive correlation between the serum progesterone levels and the motor nerve conduction velocity, suggesting the role of decreased progesterone levels of menopause as a contributing factor in the increased incidence of peripheral neuropathy in post-menopausal women.
OBJECTIVES: To determine the relation between severity of diabetic neuropathy and gender, age and duration of DM

METHODS: 42 known cases of DM presenting with symptoms of neuropathy at Neurology OPD, Dispur Hospital, Guwahati referred for nerve conduction study (NCS) to the Electrophysiology Laboratory during the period from 1st-31st August, 2012 were included in the study. Motor nerve conduction in Median and Peroneal nerves and sensory nerve conduction in Median, Ulnar, Peroneal and Sural nerves was studied. Fasting and post-prandial blood sugar on the day of performing NCS was recorded.

RESULTS:

1. Sensory nerve conduction velocity (SNCV) was affected more compared to Motor nerve conduction velocity (MNCV). The most common abnormality was absence of H-reflex followed by No-response on SNCV in Peroneal and Sural nerves followed by No-response on MNCV in Peroneal nerve.

2. The delay in SNCV was greater in subjects aged >65 years compared to those aged 35-45 years. In all age groups, delay was greater in males than in females.

3. The mean SNCV in Peroneal and Sural nerves was significantly less in patients with duration of DM 6-8 years compared to those with duration <2 years.

4. Patients with poor glycaemic control (FBS>110, PPBS>140) had greater delay of conduction velocities than those with good glycaemic control.

CONCLUSION: Age, gender and duration of DM all affect severity of neuropathy, manifested by slowing of conduction velocities. The present study, being a cross-sectional one with limited number of subjects, a follow-up study with large number of subjects is required to understand fully the impact of individual factors on development of diabetic neuropathy.

EN07OP

RELATION BETWEEN SERUM CALCIUM LEVEL, BONE MINERAL DENSITY AND BLOOD PRESSURE IN POSTMENOPAUSAL WOMEN.

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OBJECTIVES: To study the correlation between serum calcium, bone mineral density (BMD) and blood pressure in postmenopausal women.

METHODS: The present study was a cross-sectional study. Seventy postmenopausal women with age between 50 to 65 years were selected for the study with no medical, surgical or gynecological abnormalities. Body Mass Index (BMI) was calculated in each woman. Blood pressure of each woman was measured with mercury sphygmomanometer and a stethoscope in a sitting position. The BMD was measured by Bone Densitometer and classified as normal, osteopenia and osteoporosis according to T-score. Serum calcium was measured on autoanalyser.
RESULTS: BMD scores were low in postmenopausal women according to T-score along with decreased Serum calcium level. There was association between BMD and serum calcium levels. Within postmenopausal women, there was increase in BMI with slight increase in both systolic and diastolic blood pressures with respect to age but no relation between serum calcium and blood pressure.

CONCLUSION: This study suggests that there was positive association between serum calcium and BMD. The decreased concentration of calcium and BMD scores in postmenopausal women indicates that they are more prone to fractures and osteoporosis.

There is no link between blood pressure and BMD in postmenopausal women. There does not appear to be an independent relationship between serum calcium and blood pressure. The resultant increase in blood pressure was due to age and BMI.

EN08OP

CORRELATION BETWEEN GLYCOSYLATED HAEMOGLOBIN AND SUBCLINICAL NEUROPATHY IN ASYMPTOMATIC DIABETIC PATIENTS.

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OBJECTIVES: Peripheral neuropathy is a frequent and generally disabling complication of diabetes mellitus. Poorly controlled diabetes is associated with higher risk of polyneuropathy. This study evaluated the correlation of HbA1c levels, using the 6.5% cut point, with abnormal nerve conduction studies in diabetic patients in the subclinical stage of polyneuropathy.

METHODS: 30 diabetes mellitus patients with normal HbA1c levels and 30 diabetes mellitus patients with HbA1c levels more than 6.5% were selected. 30 non-diabetic, healthy subjects were chosen as a control group. The nerve conduction velocity was tested in all the diabetic subjects and the healthy controls.

RESULTS: The analysis showed that the nerve conduction velocity progressively decreased from the controls to the diabetics with a good glycaemic control, to the diabetics with a poor glycemic control.

CONCLUSION: There is a progressive neuronal involvement in the diabetic process which is accelerated by poor glycemic control. Therefore, nerve conduction studies can be employed for testing and for the early indication of neuropathy in diabetic patients.

EN09OP

ASSESSMENT OF AUTONOMIC FLNCTIONS IN OBESITY: CORRELATION WITH ANTHROPOMETRIC PARAMETERS, LIPID AND THYROID PROFILE.

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OBJECTIVES: To assess the degree of autonomic dysfunctions in obesity and its correlation with anthropometric parameters, lipid and thyroid profile.

METHODS: The study was carried out in the autonomic function testing laboratory of
department of Physiology, JIPMER, Pondicherry. 60 obese (30 males and 30 females) subjects of 18-45 age and age and gender matched 60 normal BMI subjects (30 males and 30 females) were included for this study. Heart rate variability (HRV), classical autonomic function tests (CAFTs), anthropometric parameters, lipid and thyroid profiles were recorded for all the subjects.

RESULTS: Females with normal BMI showed maximum parasympathetic and minimum sympathetic tone as well as lowest vasoreactivity to CAFTs was in highest HRV parameters were significantly less in obese subjects compared to controls. Sympathetic tone was highest in obese males. LF/HF ratio was correlated with anthropometric parameters, plasma glucose, lipid and thyroid profile.

CONCLUSION: Autonomic function test parameters are significantly different in obese compared to normal BMI individuals and there exists a gender difference.

The change in autonomic function is associated with alteration in anthropometric parameters, lipid and thyroid profile.

EN100P

SYMPATHOVAGAL IMBALANCE IN HYPOTHYROIDISM IS LINKED TO THE PLASMA LEVELS OF CHOLESTEROL AND hsCRP, BUT NOT BODY MASS INDEX.

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OBJECTIVES: Sympathovagal imbalance (SVI), an established cardiovascular risk, has been reported in hypothyroidism. The present study has investigated the link of dyslipidemia and inflammation to SVI in female hypothyroid patients.

METHODS: Age-matched ninety-eight female subjects (50 controls, and 48 hypothyroids) were recruited for the study. Their body mass index (BMI) and basal cardiovascular parameters were recorded. The resting autonomic activity was studied by spectral analysis of heart rate variability (HRV) and autonomic reactivity was studied by heart rate response to standing (30:15 ratio), deep breathing (E:I ratio) and blood pressure response to isometric handgrip (∆DBPIHG). Their thyroid and lipid profiles, immunological and inflammatory markers were estimated and correlated with ratio of low-frequency to high-frequency powers of HRV (LF-HF ratio).

RESULTS: LF-HF ratio, 30:15 ratio & ∆DBPIHG were significantly high (p<0.0001) and E:I ratio was significantly low (p<0.0001) in hypothyroid patients. LF-HF ratio, the sensitive marker of SVI was correlated with basal heart rate, thyroid profile, total cholesterol, triglyceride, anti-TPO antibody, anti-thyroglobulin antibody and hsCRP. LF-HF ratio had no correlation with BMI. The multiple regression analysis revealed independent contribution of free-T3, free-T4, total cholesterol and hsCRP to LF-HF ratio.

CONCLUSION: SVI in the form of sympathetic activation and vagal withdrawal occurs in hypothyroid patients. Hypercholesterolemia and low grade inflammation contribute to the genesis of SVI in hypothyroidism. BMI has no link to SVI in hypothyroidism. As SVI is known to predispose to cardiovascular dysfunctions, hypothyroid subjects were
advised to practice yoga to maintain their sympathovagal homeostasis.

**EN11OP**

**BRAINSTEM AUDITORY EVOKED RESPONSE AND PHASES OF MENSTRUAL CYCLE.**

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**OBJECTIVES**: To study the effect of different phases of menstrual cycle on Brainstem Auditory Evoked Response.

**METHODS**: We did a study on 50 audiometrically normal, healthy eumenorrhoeic female students of Government Medical College, Patiala in age group of 18-24 years. Brainstem Auditory Evoked Response was recorded using the instrument RMS EMG EP MARK II across the three phases of the menstrual cycle. Recordings were taken and statistically analyzed.

**RESULTS**: The difference in duration of waves and Inter Peak Latencies of Brainstem Auditory Evoked Response in three phases of menstrual cycle was not statistically significant.

**CONCLUSION**: The different phases of menstrual cycle do not seem to influence Brainstem Auditory Evoked Response.

**EN12OP**

**INFLUENCE OF MENSTRUAL CYCLE ON CARDIAC AUTONOMIC FUNCTIONS**

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**OBJECTIVE**: To study the effect of different phases of menstrual cycle on cardiac autonomic functions.

**METHODS**: The study was conducted in department of Physiology on 30 apparently healthy regularly menstruating female subjects in the age group of 18 – 25 years based on the predetermined inclusion – exclusion criteria. Effect of different phases of menstrual cycle (menstrual, proliferative, secretory) on autonomic was assessed using autonomic function tests like heart rate variability (HRT), isometric hand grip test, cold pressor test, heart rate (HR) response to valsalva maneuver, blood pressure (BP) response to change in posture.

**RESULTS**: There is a variation in autonomic function tests in different phases of menstrual cycle with predominant sympathetic activity, more so in the luteal phase than during the follicular phase.

**CONCLUSION**: Alteration in autonomic functions in different phases of menstrual cycle could be under the influence of fluctuating levels of female sex hormones that lead to salt and water retention.

**EN13OP**

**FETAL GROWTH AND DOPPLER VELOCIMETRY IN NORMAL PREGNANCY**

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**OBJECTIVES:** IUGR and Fetal distress are commonly encountered in obstetric practice. Hence colour doppler sonography is being used as a modality in all pregnancies to segregate normal from high risk cases well in advance and to improve the perinatal outcome by using doppler parameters of pulsatality index, resistivity index and S/D ratios along with fetal biometry high risk cases can be detected, thereby helping the clinician to decide proper management of pregnancy well in advance.

**METHODS:** The ultrasound was done on all 93 cases of pregnancies and the doppler waveforms studied in umbilical, middle cerebral & uterine arteries to determine PI, RI, S/D Ratios and fetal biometry was done.

**RESULTS:** In the study BPD, AC, FL showed progressive rise with increasing gestational age. The S/D Ratio in umbilical artery did not change in early gestation but had sudden fall after 30 weeks while the RI & PI gradually decreased with increasing gestational age. In the study the uterine arteries showed the gradual decline of S/D Ratio, RI, PI with rising gestational age. In the study of middle cerebral artery gradual decline of S/D ratio was noted beginning 24 weeks. The RI showed increase up to 28 weeks followed by decreasing trends. The PI showed increase up to 28 weeks there after a gradual decline was observed. Three cases were detected with severe oligohydramnios and twelve cases with moderate polyhydramnios. Twelve cases of IUGR were found. The mean for the difference between the ultrasonic gestational age and the actual gestational age was 4.7 and standard deviation was 2.24. Statistically this is highly significant data \( t=7.257 \).

**CONCLUSION:** In our study we identified 12 cases of IUGR out of 93, just by the application of biometry. We could identify the 10 cases of abnormal doppler velocimetry which were high risk cases and this enabled the obstetrician concern to plan their management in advance.

**EN14OP**

**SUBCLINICAL HYPOTHYROIDISM IN PREGNANT FEMALES ATTENDING HIHT HOSPITAL**

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**OBJECTIVES:** To study the magnitude of Subclinical Hypothyroidism in pregnant females with no previous history of thyroid dysfunction and find out its association if any with relevant clinical findings in same subjects.

**METHODS:** A cross sectional and descriptive study done in Hundred (100) pregnant female volunteers attending Obst/Gynae OPD of Himalayan Hospital at their 1st antenatal visit (1st/2nd) trimester over a period of 12 months. Study tools in the form of Structured Study instruments (questionnaire/format/subject proforma) developed, and used to generate data. Study protocol in the form of relevant obstetric and gynae history, baseline characteristics like, Anthropometric indices (height, weight, BMI), Physiological & hematological parameters like Resting Pulse Rate (beats/min), Blood pressure (mmHg), ECG Hemoglobin was followed. Thyroid function tests, FT3 (pg/mL), FT4 (ng/dL) & TSH( µIU/mL) carried out by using Access
Immunoassay system of Beckman Coulter (Germany). Subjects with serum TSH levels more than 5.0 μIU were considered as having raised serum TSH levels and were labeled as Sub Clinical hypothyroid (SCH). Data was described as mean ± SD and percentages.

RESULTS: Out of 100 studied subjects, the TSH values were more than 5.0 μIU (Reference range for TSH 2.5 -5.0 μ IU ) in 19 subjects (19%) and hence labeled as Sub Clinical Hypothyroid (SCH). The Free T3 and T4 levels were within normal range(Reference range for FT3 1.4-4.2 pg/dl, for FT4 0.8-2.5 ng/dl).

CONCLUSION: There appears a high prevalence of Subclinical Hypothyroidism in pregnant females and hence thyroid evaluation should be done in all pregnant females.

ME01OP

ANALYSIS OF ONE BEST MCQS IN PRE-UNIVERSITY PHYSIOLOGY EXAMINATIONS.

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OBJECTIVES: One best MCQs (Multiple Choice Questions) is a popular form of assessment where the student selects the best possible answer from the options provided. They allow assessment of large portion of the syllabus and properly constructed MCQs assess high orders of cognitive processing of Blooms Taxonomy instead of mere recall of facts. The objective of this study was to analyze the MCQs used in preliminary examinations in terms of Difficulty Index, Differentiation Index and Distracter efficiency.

METHODS: Total 60 MCQ items with one correct option and three distracters were taken from past 3 years preuniversity examinations (2010-2012) and analyzed for level of difficulty and power of discrimination. Each year’s examination had 2 papers, consisting of a section of 10 MCQs followed by subjective Questions. A total of 149, 156 and 154 students appeared for the exam in year 2010, 2011 and 2012 respectively. Each correct answer was scored 1 and incorrect as 0. There was no negative marking. The Difficulty index was calculated by the formula $P = R/T$, where $R$ is the number of correct responses and $T$ is the total number of responses.

High and low groups consisting of upper and lower 27 % students, respectively, were taken after arranging the scores in descending order. The Discrimination Index was then calculated as follows: $DI = 2 \times \frac{(H-L)}{N}$; where, $N$ is the total number of students in both high and low groups. $H$ and $L$ are the number of correct responses in the high and low groups, respectively.

Items with difficulty index between 0.30 - 0.70 were considered good. Items with Discrimination Index> 0.24 were taken as good discriminators.

Distracter efficiency was determined on the basis of the number of Nonfunctioning Distracters (NF-Ds). NF-Ds were those selected by less than 5% of students in an item.

Data Analysis was done using Microsoft Excel 2010.
**RESULTS:** The Difficulty indices for the six papers of 10 MCQ’s each were (Mean ± S.D) 0.50±0.24, 0.49±0.25, 0.52±0.23, 0.55±0.19, 0.73±0.22, 0.68±0.18 respectively. Differentiation indices were (Mean ± S.D) 0.37±0.12, 0.34±0.17, 0.35±0.14, 0.43±0.15, 0.40±0.15, 0.43±0.17. Thus as a whole, the papers were of average difficulty and were able to differentiate between the students. In individual analysis, total 22 MCQs were very easy (Difficulty Index>0.70) and 9 were found to be very tough (Difficulty Index<0.30). In Distracter analysis, 16.25% of the distracters were found to be nonfunctional (NFDs). 30% of the MCQ’s had One NFD, while 10% and 5% had two and three NFD’s respectively.

**CONCLUSION:** Overall, the papers had very good difficulty and differentiation indices which were quite consistent over the three years but there are a few MCQs and distracters which need to be modified to further enhance accurate assessment of the students.

**ME02OP**

**THE HISTORY AND THE FUTURE OF PHYSIOLOGY**

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This review of literature is to self-study the functioning of Physiology Department as an independent Department and essential part of Medical Education.

Nowadays Medical Education Units integration is a good and beneficial for the MBBS students. Physiology Teachers were enslaved to the dogmatism of Medical Education Unit theories which lead to erroneous conceptions. Our concern is mainly the Physiology Department and we as Physiologists should teach, assess and curricular redesigning by ourselves.

The oldest literature in the world is found in the Rig-Veda (4000 B.C to 2500 B.C) which includes divine remedies for disease. “Essentially the doctor is a teacher” Galen concluded. In 1594, Fabricius ab Acquapendente (1537-1619), Professor of Anatomy and Surgery, built the first permanent anatomy theatre. The foundation stone of physiology was laid by William Harvey (1578 - 1657). Johannes Evangelista Purkinje (1787-1869) created the world’s first Department of Physiology at University of Breslau, Prussia (1839), at 36 years of age.

Claude Bernard, “I am fighting for Physiology because it is the future of Medicine”. Angelo Mosso (1846 –1910) of Turin, Italy “The concepts that you can hear resounding in this room will open new frontiers to the mind of those young people who are listening to you”. Dr. Arthur Guyton was a REAL HERO to the world, and his legacy is everlasting. Dr Guyton’s philosophy of education was to “learn by doing.” He would never accept an invitation to give a prestigious lecture if it conflicted with his teaching schedule.

J receptor was the first great discovery in the field of medicine in independent India by Autar S Paintal (1925–2004). The eventual abolition of laboratory teaching in the 1970s resulted from curriculum reform, student revolt, and faculty indifference. Although departments of physiology disappear or integrate, it does not mean that physiology is disappearing in teaching and research, but that it is less visible as a separate discipline.
We conclude that the future of Physiology is within the hands and the new ideas from the intuitive research of our young Physiologists.

**MT01OP**

**INVESTIGATION OF THE RELATIONSHIP BETWEEN SHORT-TERM, MODERATE ALCOHOL CONSUMPTION AND SERUM LIVER-DERIVED ENZYMES IN INDIAN MEN.**

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**OBJECTIVES:** Increasing evidence suggests that long-term, alcohol abuse may have powerful implications for health; however, very few studies have focused on the association between short-term, moderate drinking and risk of alcoholic liver damage. This study was aimed at examining the association between liver enzymes and short-term, moderate alcohol consumption.

**METHODS:** We recruited thirty, apparently healthy young (20-40 years) men with history of daily 2 to 3 units of alcohol intake for the past 1 to 3 years duration. Another thirty men, who were alcohol abstainers, served as controls. Two ml of blood was collected and Liver enzyme levels were estimated by Random Access Clinical Chemistry Analyzer ERBA-XL-300. Data were analysed using the unpaired ‘t’ test.

**RESULTS:** Serum AST (*P* < 0.001), ALT (*P* < 0.001) and GGT (*P* < 0.001) activities were significantly increased, whereas ALP (*P*>0.05) activity was decreased in moderate drinkers compared to abstainers.

**CONCLUSION:** Moderate alcohol consumption even for a short duration significantly affect liver function.

**KEYWORDS:** Alcohol, Gamma glutamyl-transferase, Hepatic Enzymes, Liver Disease

**MT02OP**

**EFFECT OF SEVERE MALNUTRITION ON BRAINSTEM AUDITORY EVOKED RESPONSE.**

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**OBJECTIVES:** To study the effect of severe malnutrition on Brainstem Auditory Evoked Response.

**METHODS:** The present study was a case control study conducted on 30 severely malnourished children (as defined by WHO classification) and 30 healthy children in age group of 2-8 years in a teaching hospital of north India. The brainstem auditory evoked response was recorded using the instrument RMS EMG EP MARK II. The duration of waves, inter peak latencies and amplitude of waves were recorded and statistically analyzed.

**RESULTS:** The duration of waves I, II, III and IV were increased in children with severe malnutrition. The interpeak latencies I-III and
III-V were also found to be increased. There was statistically insignificant difference in the amplitude of waves between the two groups.

**CONCLUSION:** The conduction of auditory pathway is affected by the nutritional status of the individual.

**MT03OP**

**STUDY OF OXIDATIVE STRESS AND STATUS OF ANTIOXIDANTS IN PLASMA OF CORD BLOOD OF NEWBORNS WITH GESTATIONAL AGES BETWEEN 34 TO 40 WEEKS DELIVERED VAGINALLY.**

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**OBJECTIVES:** Oxidative stress occurs as a consequence of imbalance between the formation of oxygen free radicals and inactivation of these species by antioxidant defence system. Birth exposes the neonate to a higher PO2 than experienced in utero. Preterm infants (< 37 weeks) are susceptible to antioxidant injury and diseases associated with oxidative stress. Thus the Aim of this study is to measure the oxidative stress and levels of antioxidants in plasma of cord blood of Newborns with gestational age of 34 to 40 weeks delivered vaginally.

**METHODS:** We collected the cord blood of 28 healthy newborns delivered vaginally in the labor room of Obstetric department in our institution. All the newborns were having gestational ages between 34 to 40 weeks, weighed more than 2.5 Kg and were born to mothers without any risk factors. The four parameters namely Malonaldehyde, Uric acid, Vitamin C and Vitamin E levels were measured in the cord blood of these newborns.

**RESULTS:** The activity of MDA (4.91 ± 0.67 vs 2.45 ± 0.23 nmol/ml; P < 0.001) and UA (4.63 ± 0.39 vs 3.26 ± 0.27 mg/dl; P < 0.001) were increased while levels of Vit C (0.575 ± 0.133 vs 0.804 ± 0.251 mg/dl; P < 0.001) was decreased in preterm newborns as compared to term babies both born to healthy mothers. The differences were statistically significant. No significant difference was observed in the levels of Vit E in the two groups (9.931 ± 2.434 vs 9.055 ± 1.289 mg/l; P > 0.05)

**CONCLUSION:** The above results suggest that prematurity is associated with significant oxidative stress and decreased antioxidant levels as compared to term gestation.

**MT04OP**

**PLASMA LIPID PROFILES AND RISK OF CARDIOVASCULAR DISEASE WITH INCREASE BLOOD LEAD LEVEL IN OCCUPATIONAL LEAD EXPOSED BATTERY WORKERS OF LUCKNOW CITY, INDIA**

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**OBJECTIVES:** To investigate the effects of lead (Pb) exposure on Plasma lipid profiles with risk of cardiovascular disease in Occupational battery workers.

**METHODS:** The study conducted on 60 industrial employees (case group) exposed lead through acid battery in the battery manufacturing and refilling & battery shops. Plasma cholesterol and its fractions as high-density lipoprotein (HDL), low-density
lipoprotein (LDL) and triglyceride (T.G.) were determined in various battery workers in Lucknow city U.P., India.

Who have been shown to be occupationally exposed to lead, and these were related to blood lead levels. Increased risk of cardiovascular disease was observed in the various battery workers in Lucknow city U.P., India.

**RESULTS:** Total cholesterol in the battery workers and control group was 142.14±31.92 (mg/dl) and 95.72±11.57 (mg/dl) respectively, which is higher in the battery workers than that of present in control group, and p-value is P<0.0001. While LDL cholesterol was in the battery workers and control group 158.30±22.70 (mg/dl) and 103.77±4.62 (mg/dl) respectively. HDL cholesterol was in the battery workers and control group 38.80±10.13 (mg/dl) and 65.53±6.52 (mg/dl) respectively. The triglyceride levels were 162.06±90.85 (mg/dl) and 138.62±5.65 (mg/dl) in the battery workers and control group respectively.

The LDL/HDL and Total cholesterol/HDL cholesterol ratio was also higher in the battery workers. Blood pressure (systolic and diastolic), blood lead level was also higher in the battery workers.

**CONCLUSION:** Results suggest that lead exposure increases cholesterol synthesis and transport to peripheral tissues whereas reverse cholesterol transport to the liver is not affected.

**NS01OP**

**EFFECT OF ELECTROMAGNETIC WAVES EMITTED FROM MOBILE PHONE ON AUDITORY EVOKED POTENTIAL AND COGNITIVE P_{300} POTENTIAL.**

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**OBJECTIVES:** Study is planned to see the effect of electromagnetic radiation (EMR) emitted from mobile phone (MP) on brain stem auditory evoked potential (BAEP) and cognitive P_{300}

**METHODS:** Study was carried out in 15 healthy male subjects in the age group of 20 – 40 years with duration of exposure to MP around 1 hour/ day for the last 5 – 8 years. After explaining the procedure, consent was taken and recording was done on computerized evoked potential recorder (RMS EMG MK-2) using 10/20 system of electrode placement and standard click stimuli. Active electrode (Ag / AgCl disk electrodes) were placed at Cz with reference electrodes on the mastoid at A_1 and A_2 and ground electrode at Fz. The click stimuli of intensity 70db above normal hearing threshold at the rate of 10/s and of 0.1ms duration square pulses through shielded head phone were presented monaurally with alternate polarity. The other ear was masked by noise 40db. P_{300} was recorded by standard auditory oddball paradigm. Waves of BAEP and P_{300} were recorded before and after exposure to MP. Statistical analysis was done by paired “t” test.

**RESULTS:** In right ear, significant (p <0.05) increase in latency of II, III and V wave and amplitude of I-Ia wave occurred after exposure to MP (dominating ear) without any effect on left ear waves. When right and left ear were compared before exposure to MP, IPL of III – V wave and amplitude of V – Va is
more (<0.001) in right ear compared to III – IV wave latency (<0.001) before exposure. After exposure to EMR, amplitude of V – Va is more in right ear. An increase (p<0.01) in amplitude of P_{300} without any change in latency was recorded after exposure to MP.

**CONCLUSIONS:** EMR affects auditory evoked potential and cognitive behavior.

**NS02OP**

**NEUROCOGNITIVE FUNCTIONS IN MAJOR DEPRESSION.**

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**OBJECTIVES:** To study neurocognitive functions in major depression.

**METHODS:** Group I was comprised of 42 males and 18 females (aged 18 – 45 years) which included drug free freshly diagnosed cases of major depression on the basis of DSM IV criteria. Group II had 39 males and 21 females (aged 18 – 45 years) which were healthy individuals. Group II was screened for any sub psychiatric illness by Goldberg’s general health questionnaire (GHQ). Both the groups were rated on Hamilton Rating scale for depression (HAM-d).

Patients & controls were included according to the inclusion and exclusion criteria. Instruments used in the study are (1) Diagnostic and statistical manual of mental disorders – IV ,(2) Hamilton Rating Scale for depression (HAM – D), (3) Standardized Hindi Version of Goldberg’s General Health Questionnaire,(4) Neurocognitive test batteries included Trail Making Test A, Trail Making Test B, Forward Digit Span, Reverse Digit Span. Neurocognitive test battery was applied on both groups to assess visuomotor speed, attention span, short term memory and executive functions like working memory etc.

**RESULTS:** In the present study, the depressed patients showed a significant impairment on TMT-A when compared to control group (p < 0.001), hence, depicting an impairment of visuomotor speed and attention span. The group I performance was also significantly impaired on TMT – B when compared to control group (p < 0.001). Group 1 showed more impairment on TMT-B as compared to TMT- A. The depressed patient showed a significant impairment on digit forward test when compared to controls (p < 0.01) and highly significant impairment on digit reverse test when compared to control group (p < 0.001).

**NS03OP**

**A STUDY OF THE EFFECTS OF VOLUNTARY HYPERVENTILATION ON ELECTROENCEPHALOGRAM OF NORMAL AND GENERALISED EPILEPSY PATIENTS.**

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**OBJECTIVE:** a) To compare the effects of hyperventilation on EEG of generalised epilepsy patients during interictal period and of normal subjects.

b) To compare hyperventilation induced EEG changes in patients < 30 years and > 30 years age.
c) To quantify the changes in various categories of generalised epilepsy.

**METHODS:** A comparative study in Assam Medical College, from June to September 2012. EEGs were recorded using hyperventilation for 5 minutes as activation procedure in 54 patients of generalised epilepsy (5-60 years, males= 31, females= 23) and compared with 54 age and sex matched normal subjects.

**RESULTS:** Among 54 patients, 31.48% and among normal only 7.4% showed changes, (significant). ($p=0.0029$).

Among cases with changes, generalised slowing occurred in 76.5 % (13 of 17), fresh interictal epileptiform discharges (IEDs) in 35.3%, increased IEDs in 52.9%. None had clinical seizure during hyperventilation. 42.85% (15 of 35) of patients in <30 years group and 10.5 % (2 of 19) of patients in >30 years group showed changes (significant).($p=0.0165$). Of 44 cases of generalised tonic clonic seizures, 29.5% showed changes, of which, 92.3% showed generalised slowing (12 of 13), 38.5% increased IEDs and 46.15% fresh IEDs. 66.67% (2 of 3) of absence seizures, 33.34% of juvenile myoclonic epilepsy, 25% of tonic seizures showed changes which were mainly increased IEDs.

**CONCLUSION:** Hyperventilation increases the yield of electroencephalographic recordings of generalised epilepsy patients, more so in those less than 30 years.

**NS04OP**

**ROLE OF PREOPTIC AREA THERMO TRANSIENT RECEPTOR POTENTIAL VANILLOID (TRPV1) CHANNEL IN THERMOREGULATION IN RATS**

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**OBJECTIVES:** To study the effect of microinjection of transient receptor potential vanilloid (TRPV1) channel agonist in the preoptic area on brain and body temperature in rats

**METHODS:** The study was conducted in 12 male Wistar rats. Surgical procedures were performed for implantation under thiopentone sodium anesthesia (40 mg/kg body weight, i.p.). A bilateral guide cannula (24G) with indwelling styls was implanted with their tips aimed at 2mm above the POA as per De Groot’s atlas. A radio transmitter TA10TAF-40 (Data Science International, USA) for the telemetric recording of body temperature was implanted in the abdomen. K type thermocouple wire was inserted near hypothalamus in order to measure the brain temperature. Brain temperature was recorded at 15 second interval through fluke digital thermometer.

Body temperature was recorded telemetrically at 15 second interval. The temperature was measured from 10AM to 4PM and injection was given at 12 PM. Temperature data was averaged at 15 minute epochs. TRPV1 agonist, capsaicin injection was given bilaterally (0.2µl) at a rate of 0.1µl/min using injector cannula at the POA. Saline was used as a control. The site of injection was confirmed by histologically. The statistical comparison was made between pre and post injection record as well as saline matched control

**RESULTS:** In rats the injection of capsaicin (0.2µg/0.2µl) into preoptic area of anterior
hypothalamus produce a prompt fall in body and brain temperature.

**CONCLUSION:** The TRPV1 channel agonist injection in the POA brings about fall in body and brain temperature by stimulating warm sensitive neurons.

**NS05OP**

**ABSOLUTE PEAK LATENCIES AND INTER-PEAK LATENCIES IN PATIENTS OF MIGRAINE IN THE INTER-ICTAL PERIOD.**

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**OBJECTIVES:** Migraine is a common primary chronic intermittent neurovascular disorder characterised by episodic severe headache accompanied by autonomic dysfunction and in some patients transient neurological symptoms called migraine aura. The aim of our study was to compare the BAEPs (brainstem auditory evoked potentials) in the migraine patients compared to controls.

**METHODS:** This study was conducted in the Department of Physiology, Maulana Azad Medical College, New Delhi over a period of one year 40 female subjects were selected, which were divided into two groups of 20 each- **Group A** : cases of migraine and **Group B** : controls. BAEPs were recorded in each subject atleast three times and were analysed for absolute latencies of waves I to V (in msec) along with the three most important inter-peak latencies (I-III,I-V and III-V).

**RESULTS:** There was no significant difference in the absolute latencies of waves when comparison was made between the two groups. However the inter-peak latencies were significantly higher in Group A compared to Group B (P<0.05).

**CONCLUSION:** It can be seen from our study that there is prolongation of the inter-peak latencies of waves in migraine patients in the inter-ictal period compared to controls. This suggests the involvement of brainstem structures supporting the brainstem theory of the pathophysiology of migraine. Hence BAEPs can be used as an effective tool for evaluating the neurophysiological status of the auditory pathway in patients of migraine.

**NS06OP**

**TO MEASURE CHANGES IN INFLAMMATORY MARKERS IN PATIENTS OF DEPRESSION.**

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**OBJECTIVES:** Depression has been associated with cardiovascular morbidity and mortality. Inflammatory processes, associated with depression has been suggested as one of the possible mechanisms. The objective of our study is to measure changes in inflammatory markers in patients of depression.

**METHODS:** Thirty drug naive patients of depression attending OPD of psychiatry, LHMC & SSKH, in the age group of 20-45 years were recruited and diagnosed on basis of ICD-10 criteria. They were compared with age and gender matched healthy controls. Socioeconomic status, educational status and
BMI (kg/m²) were also matched. Patients suffering from any known physical illnesses or other psychiatric disorders and those with substance dependence, pregnant females were excluded. Controls were chosen after excluding those with psychiatric and any known physical illnesses by history, clinical examination and General Health Questionnaire. Fasting venous blood samples were collected between 9 am to 12 noon. Blood samples were centrifuged to isolate serum and serum levels of IL-6, TNF-α, and hsCRP were measured using ELISA method.

RESULTS: The serum hsCRP levels were statistically significantly (p<0.05) higher, serum levels of IL-6 (p=0.055) and TNF-α (p=0.053) were higher although not statistically significant in depression group as compared to control group.

CONCLUSION: The present study demonstrates that Depression is associated with underlying low-grade inflammation, which might contribute to pathophysiology of depression and increased morbidity.

NS07OP

CLINICAL AND ELECTROPHYSIOLOGIC EVALUATION OF PERIPHERAL NEUROPATHY IN HIV INFECTED PATIENTS.

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OBJECTIVES: 1. To determine motor nerve conduction velocity (MNCV) in ulnar, medial, posterior tibial and deep peroneal nerves in controls and in HIV infected patients with and without neuropathy.

2. To determine sensory nerve conduction velocity (SNCV) in ulnar & median nerve in controls and in HIV infected patients with & without neuropathy.

3. To compare the results obtained between controls and HIV infected patients with and without neuropathy.

4. To determine nerve conduction velocity in above nerve according to CD4 counts.

METHODS: Present study was carried out in 60 HIV patients of age 15-49 yrs. HIV patients were divided as 30 with neuropathy and 30 without neuropathy. HIV patients were compare with 30 age matched controls. HIV patients divided according to CD4 counts between <200, 200-400 & > 400.

RESULTS: HIV infected patients were subjected to clinical and electrophysiologic evaluation had features of peripheral neuropathy.

CONCLUSION: Motor & sensory nerve conduction velocity decreased in HIV with & without neuropathy patients as compared to controls.

Patients in the lowest CD4 counts had significantly decreased sensory & motor NCV than patients with higher CD4 counts.

NS08OP

THE STUDY OF AUDITORY AND VISUAL REACTION TIME, WORKING AND SHORT TERM MEMORY STATUS IN TYPE 1 DIABETIC AS COMPARED WITH HEALTHY YOUNG ADULTS.


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**OBJECTIVES:** The objective of study is to examine reaction time, working and short term memory status in type 1 diabetics compared with healthy young adults.

**METHODS:** This is a cross sectional comparative study. The study was conducted in 50 diagnosed Type 1 Diabetics in the age group of 18-25yrs and 50 healthy age and sex matched subjects. They were assessed for auditory and visual reaction time with the help of an instrument called ‘Reaction Time Apparatus’ designed by Anand Gas Agencies, Pune. For working and short term memory status they were assessed using Mini Mental State Examination (MMSE), test of 10 words for short term memory, working digit span test: forward and backward, letter/number sequencing test, Benton visual retention test.

**RESULTS:** The mean auditory and visual reaction times are significantly increased in cases of Type 1 Diabetes mellitus as compared to healthy young adults. Whereas there is significant decline in working and short term memory status in type 1 Diabetics as compared to healthy young adults.

**CONCLUSION:** Delay in reaction time and decline in working and short term memory status can be taken as non-invasive, low cost sensitive indicator of early nerve damage.

**STUDY OF VISUAL EVOKED POTENTIAL AND VISUAL REACTION TIME IN CHRONIC ALCOHOLICS.**

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**OBJECTIVES:** Alcohol abuse is a known social problem world wide. Recording of visual evoked potential (VEP) is a sensitive for detection of subclinical lesion of visual pathway, So the study was designed to assess the effect of (VEP) and visual Reaction time in chronic alcoholics.

**METHODS:** It is a case control study included 24 male subjects in age group 25-55yrs from general population were recruited after detailed history and clinical examination. They were divided into group A (n=12), males consuming alcohol ≥21 units for 1 week for ≥5yrs, 1 unit = 25 ml of alcohol and group B (n=12) healthy age, sex, socioeconomic status matched and not consuming alcohol as controls. VEP was recorded with RMS VEP-32 SUPERSEC machine in a dark room by pattern reversal. Visual reaction time will be measured by RESPONSE ANALYSER in a room with good visibility.

**RESULTS:** No significant difference in P 100 latency duration was found for Rt and Lt eye in both alcoholics and controls, P 100 latency duration was significantly prolonged (p<0.05) in chronic alcoholics (104.20ms ±0.633) than controls (101.06±0.628). Amplitude of P 100 was significantly (p<0.05) less in chronic alcoholics (9.58uv ± 0.233) than controls (10.81uv± 0.335). Visual reaction time was significantly reduced in alcoholics (p<0.05), red light (0.211 ms±0.004), green light (0.204 ms ±0.001), Indigo light (0.204 ms±0.001) as compared to controls red light (0.191 ms±0.001), green-light (0.193 ms ±0.002), indigo-light (0.196±0.001)

**CONCLUSION:** VEP’s can be used in early detection of alcohol induced central neuropathy and progression of disease. Measurement of reaction time helps in
counselling and reducing relapse in chronic alcoholics.

**KEYWORDS:** chronic alcoholics, VEP, P100, Reaction time

**NS10OP**

**AUDITORY & BRAINSTEM RESPONSES IN HYPERBILIRUBINEMIC INFANTS.**

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**OBJECTIVES:** Jaundice is a common finding in neonates affecting 70% of term & 80% of preterm neonates during the first week of life. So the objective of this study is to evaluate auditory & brainstem responses in hyperbilirubinemic infants & to see if there is any statistically significant increase in latencies of wave I,III & V waves. To initiate rehabilitative procedure as early in life as possible a screening method to detect auditory disabilities in hyperbilirubinemic infants is of great importance. So the present study is done to know the incidence of hearing loss in hyperbilirubinemic infants & to evaluate the waves I,III & V in those subjects.

**METHODS:** 33 Infants with hyperbilirubinemia >12mg% & with no other risk factor who visited pediatric OPD of Bapuji Child Health Centre were evaluated using RMS EMG. EP MARK –II machine. Latencies of Waves I, III & V, & interpeak latency of I-V were recorded.

**RESULTS:** On one sample t-test latency of wave I & IPL I-V were significantly increased (p-value <0.001), latency of V was prolonged which was statistically significant (p-value <0.01). Hearing impairment in the affected infants & complete deafness where none of the waves were recorded signify that it is a risk factor for deafness.

**CONCLUSION:** Since hyperbilirubinemia is a risk factor for hearing impairment, their hearing screening by BERA at the earliest will help in their earliest initiation of rehabilitation when the brain is sensitive to the development of speech & language.

**NS12OP**

**EVALUATION OF BABINSKI REFLEX IN INFANTS.**

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**OBJECTIVES:** BR is one of the infantile reflexes. Most newborn babies are not neurologically matured and therefore show a BR. Upon stimulation of the sole, they dorsiflex the great toe smaller toe will fan out. Objective of our study was to evaluate the Babinski reflex in infants.

**METHODS:** Study was conducted on 869 Infants, babies of either sex which was categorised as preterm 120, Term SGA 123, Term AGA 215, 1.1-6 months 196 and 6.1-12 months were 205. Their plantar response was assessed using thumb nail drag method. The response was graded as flexor, extensor, equivocal and asymmetrical.

**RESULTS:** plantar response was recorded as in preterm AGA extensor 75%, flexor 5%, equivocal 8.3% and asymmetrical 11.7%. In term SGA extensor 61.8%, flexor 9.8%, equivocal 13%, asymmetrical 15.4%. In term AGA extensor 61.9%, flexor 12.1%, equivocal
14.9%, asymmetrical 11.2%. In 1.1-6 months infants extensor 78.1%, flexor 9.7%, equivocal 6.6%, asymmetrical 5.6%. In 6.1-12 months infants extensor 38%, flexor 37.6%, equivocal 9.8%, asymmetrical 14.6%.

**CONCLUSION:** Study showed predominant extensor response in neonate and infants upto 6 months of age. 6-12 months of babies, approx. 50% shows extensor plantar response.

**OT01OP**

**PREVALENCE OF HELICOBACTER PYLORI INFECTION IN PEPTIC ULCER DISEASE IN MANIPUR: A PRELIMINARY STUDY**

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**OBJECTIVES** Helicobacter Pylori, a gram negative micro-aerophilic bacterium has been strongly linked aetiologically to peptic ulcer disease. The aim of the study was to assess the prevalence of H. pylori infection in Peptic Ulcer Disease (PUD) patients attending Regional Institute of Medical Sciences, Medicine out patient department.

**METHODS:** 1 ml of fresh venous blood was collected in a syringe. The H. pylori antibody test for qualitative detection of Isotope (IgG) antibodies specific to H. pylori was done and results analysed.

**RESULTS:** From 40 PUD cases analysed The mean age was found to be 32.275± 6.67 years. The male female ratio was 1.5:1. Out of the 40 cases screened 8 cases were found to be having H. pylori positive.

**CONCLUSION:** A high prevalence of H. pylori infection was found in PUD patients. However as the study is still progressing therefore the exact prevalence is still not known. H. pylori antibody test is a easy, rapid, cost-effective and well suited for screening purpose.

**OT02OP**

**THE PHYSIOLOGY OF THE LOWER OESOPHAGEAL SPHINCTER IN ACHALASIA OF THE CARDIA: A MANOMETRIC PERSPECTIVE.**

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**OBJECTIVES:** High resolution oesophageal manometry is undertaken to study the functions of the oesophagus and the lower oesophageal sphincter (LOS) in detail. The LOS exhibits various motility characteristics that are typical to achalasia. The study was conducted to study the physiology of the LOS in achalasia with a 16-channel water perfusion high resolution oesophageal manometer.

**METHODS:** High resolution oesophageal manometry was performed in thirteen adult patients of achalasia, and the physiology of the LOS was evaluated in terms of resting or basal pressures and relaxation to swallows.

**RESULTS:** Twelve out of thirteen cases of achalasia had a high basal LOS pressure (BLOSP), while one had reduced pressure. All cases of achalasia had an elevated LOS nadir pressures, indicating an incomplete relaxation of the LOS. All thirteen cases of achalasia showed absence of peristalsis.
CONCLUSION: A high BLOSP is a supportive evidence for a diagnosis of achalasia, and not a defining manometric feature for this condition, which in turn are an incomplete LOS relaxation and failure of peristalsis. A reduced BLOSP is rare in achalasia, and so is a normal BLOSP, however, they have been described in literature, and hence the BLOSP as such cannot be considered as a diagnostic feature of achalasia on manometry.

OT03OP

CONTRACTILE CHARACTERISTICS OF NEONATAL GUT SMOOTH MUSCLES IN VITRO.

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OBJECTIVE: Gut motility disorders are one of the major cause of mortality and morbidity of neonates. However, the knowledge on contractile activities of neonatal gut is inadequate to address various gut motility related problems. Therefore, the present investigation was undertaken to understand the contractile characteristics of gut by recording the spontaneous as well as the chemically evoked contractions from segments of small intestine, rectum and colon obtained from neonate of both human and albino rat.

METHODS: In vitro contractile activities were recorded from various segments of gut using organ bath preparations maintained in physiological solution. The isometric contractions were recorded via a fine force transducer and bridge amplifier on to a personal computer after digitization. The human neonatal gut samples were obtained from the neonates operated for different types of congenital gut malformations in the pediatric surgery OT. The rat neonates were made available from the departmental animal house. The spontaneous contractile activities were assessed in terms of the force generated and frequency of contractions. Further, the effect of agonists (acetylcholine and histamine) and their antagonists and the effect of temperature were also evaluated.

RESULTS: The spontaneous phasic contractions with higher frequency and low amplitude were observed in small intestine, while in colon and rectum the contractions were of tonic type with lower rate in human neonates. Similar results were also observed in rat neonates. However, the chemically (acetylcholine and histamine 0.01 - 100μ) evoked responses showed different effects in rat and human neonates indicating histaminergic preponderance in human. The contractile force significantly (P<0.05) increased in rectum as compared to colon in response to lower temperature and the response was stronger in adult as compared to neonate rats.

CONCLUSIONS: The in vitro contractile responses of different parts of neonatal gut differ in respect to the acetylcholine, histamine and cold induced stimulations.

OT04OP

EFFECT OF CLASSICAL MUSIC ON UMBILICAL BLOOD FLOWS IN NORMAL PREGNANCIES AND PREGNANCY INDUCED HYPERTENSIVES USING COLOR DOPPLER INDICES

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OBJECTIVE: To evaluate the effect of classical music on umbilical blood flow patterns in normal pregnancies and pregnancy induced hypertensives using color Doppler indices.

METHOD: Total 50 pregnant subjects, aged 24-28 years with 28-32 weeks of gestation were divided into two groups. Group A consisted of 25 normal pregnant females and Group B of 25 pregnancy induced hypertensives. Umbilical blood flow patterns were recorded by color doppler method in both groups. All the subjects were subjected to listen soothing classical music for half an hour daily for 2 weeks. After 2 weeks umbilical blood flow patterns were recorded again in all subjects. Students t test was done.

RESULTS: Significant differences in values were found in pregnancy induced hypertensives in pre and post conditions with p value 0.001 in RI and 0.005 in PI in umbilical artery flow in comparison to normal pregnant females in pre and post conditions with p value 0.050 in RI and 0.048 in PI in umbilical artery flow.

CONCLUSION: Classical music can be an effective tool to increase umbilical blood flow especially in pregnancy induced hypertensives and thus reducing its complications and improving fetal outcome.

RS01OP

SPIROMETRIC LUNG FUNCTION PROFILE OF TYPE II DIABETES MELLITUS IN MANIPUR.

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OBJECTIVES: To measure lung volumes of diabetic patients.

METHODS: A cross sectional study was carried out among 39 diabetic patients in the Departments of Physiology and Respiratory Medicine, RIMS Imphal. Spirometric recordings were estimated by using Computerized Spirometer - HELIOS 701. Among three consecutive spirometric recordings the best result was taken. Blood glucose level was determined by glucose oxidase method. Statistical analysis was done using Student’s ‘t’ test.

RESULTS: The mean age of diabetic patients was 56.58±4.79 years. After lung function test, mean FVC of the patients was 2.18±0.70 L as compared to the predicted value of 2.67±0.63 L (p = 0.002). Mean FEV1 was found to be 2.02±0.63 L as compared to the predicted value of 2.08±0.53 L (p = 0.670) and mean FEV1/FVC ratio was found to be 0.93±0.06 compared to the predicted value of 0.77±0.02 (p<0.05). Functional lung impairment was observed in 43.58% of patients which was graded according to ATS criteria of restrictive lung diseases based on FVC%. 30.76% of patients had mild restriction (FVC 65-80% predicted), 10.25% of patients had moderate restriction (FVC 50-65% predicted) and 2.56% of patients had severe restriction (FVC<50% predicted).

CONCLUSION: Diabetic patients showed modest, albeit statistically significant impaired lung function in restrictive pattern with 30.76% showing mild restriction (FVC 65-80% of predicted), 10.25% moderate restriction (FVC 50-65% of predicted) and
2.56% severe restriction (FVC <50% of predicted).

RS02OP

ORAL CONTRACEPTIVE PILLS DECREASES PULMONARY AIRWAYS RESISTANCE IN NORTH INDIAN HEALTHY WOMEN.

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OBJECTIVES: Oral contraceptive pills are the hormonal pills used by the females to prevent conception, it is a combination of estrogen and progestin. There is however, compelling evidence that, throughout a women’s reproductive life, her airways are subject to the influence of the cyclical variations in sex hormones which occur in relation to circadian rhythms. The present study has been designed to investigate the effects of OCPs on the airways resistance in term of spirometric parameters on OCP users and non users.

METHODS: A total of 100 women (age: 20-40 years) were selected for the present study. The subjects were provided with a 1-month supply of OCP. The constituents per table of MALA-N used were Levonorgestrel I.P.-0.15 mg and Ethinyloestradiol I.P.-0.03 mg. Peak Expiratory Flow Rate (PEFR), Forced Expiratory Flow in Expiring 25%-75% air (FEF 25-75), Forced Expiratory Volume percentage in 1 second (FEV1% or FEV1/FVC), Forced Vital Capacity (FVC) and Forced Expiratory Volume in 1 second (FEV1) were recorded.

RESULTS: In our study, the FEF 25-75 and PEFR was increases significantly in OCP users showed that these hormone pills decreases the resistance offered by small bronchioles.

CONCLUSION: On basis of our observations we concluded that OCP user females may be less prone to bronchial asthma and these hormonal pills may be one of the strategies for asthma control.

RS03OP

STUDY OF RIGHT VENTRICULAR FUNCTION IN PATIENTS OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE.

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OBJECTIVES: Chronic obstructive pulmonary disease (COPD) has considerable effects on cardiac functions primarily affecting the pulmonary vasculature and then right ventricle along with left ventricle. One of the important causes of increased morbidity and mortality associated with COPD is cor pulmonale. Echocardiography provides a rapid, non-invasive method to evaluate cardiac changes. Our aim was to evaluate right ventricular function in COPD as per guidelines of American Society of Echocardiography with an aim to find a simpler way of predicting cardiac morbidity and mortality.

METHODS: A cross sectional observational study was conducted on seventeen COPD patients attending Respiratory Medicine outdoor of R.G.KAR Medical College &
RESULTS: Fractional area change of right ventricle (FAC %) is positively correlated with FEV₁ (r=0.4879), FEV₁/FVC ratio (r = 0.5048) and PEFR (r = 0.5361). There is strong negative correlation of Systolic Pulmonary Artery Pressure (SPAP) with FEV₁/FVC ratio (r = -0.5553) and PEFR (r = -0.4604). Myocardial Performance Index (RIMP) of right ventricle is negatively correlated with FEV₁/FVC ratio (r = -0.598), PEFR (r = -0.619), FEF₂₅⁻₇₅ (r = -0.515). Tricuspid annular plane systolic excursion (TAPSE) does not show any association with PFT parameters though it shows strong positive correlation with RV wall thickness.

CONCLUSION: This study substantiates that FAC% and RIMP can be vital prognostic factors for RV function apart from SPAP, TAPSE to define RV dysfunction and predict morbidity and mortality in COPD.

RS04OP

EFFECT OF BIOAEROSOL EXPOSURE ON RESPIRATORY HEALTH OF WORKERS IN VEGETABLE MARKET OF NAGPUR, INDIA.

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OBJECTIVES: Bioaerosol pollution of workplace environment mainly affects the airways and mucous membrane. Hence this study was done to estimate the prevalence of respiratory symptoms and lung functions in individuals exposed to mixed bioaerosols in a vegetable market and to test the association of age of an individual with various lung function tests.

METHODS: Bioaerosol characteristics of air in the market were analysed by Reusable Aluminium Two Stage Viable Anderson Cascade Impactor. Spirometry with American Thoracic Society (ATS) standards was done in non-smoker 640 individuals; 210 individuals exposed to dust and 430 individuals living around the same area but not exposed to dust. According to age 2 groups were made.Group A (20-30years) having 110 exposed and 220 unexposed individuals .Group B (31-40years) having 100 exposed and 210 unexposed individuals.Spirometry results were compared between 2 groups using SPSS software version 16.0.2.

RESULTS: The bioaerosol analysis revealed high level of polluting microbial components.In exposed individuals compared to unexposed individuals prevalence of respiratory symptoms was significantly high(p<0.05) and spirometry demonstrated significant reduction in Forced Vital Capacity(FVC), Forced Expiratory Volume in 1 second(FEV1), Forced Expiratory Flow at 25% to 75% Vital Capacity(25% -75%) and Peak Expiratory Flow Rate(PEFR).There was significant positive correlation between age and decrease in all the recorded spirometry parameters(p<0.05).

CONCLUSIONS: Occupational exposure to mixed organic dust is associated with significantly higher respiratory symptoms and decreased spirometric values necessitating medical attention. So there is need of preventive measures and health education in this population.

RS05OP
ASSOCIATION OF ENDOTHELIUM MEDIATED VASCULAR REACTIVITY WITH SYSTEMIC INFLAMMATION IN COPD PATIENTS.

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OBJECTIVES: To assess the correlation of inflammatory marker (C- Reactive Protein) with endothelium mediated vascular reactivity in COPD patients.

METHODS: Sixteen male patients of stable COPD (FEV1/FVC < 0.7) and 14 age and gender matched healthy subjects were enrolled in the study. Patients with cardiovascular co morbidities were excluded. Vascular reactivity was assessed non invasively by measuring maximal percentage changes in Pulse Wave Amplitude (PWA) during reactive hyperemia (RH) by Photoplethysmography (PPG) in both the groups. CRP levels were measured as a marker of inflammation in both the groups by Enzyme Linked Immunosorbent Assay (ELISA).

RESULTS: Maximal percentage changes in PWA with reference to baseline were significantly lower in patients as compared to controls. \[23.61\% (12.02-34.7) \text{ versus } 49.31\% (46.44-62.01) \text{ p=0.0003}\]. CRP levels were significantly higher in patient group as compared to controls [10.45mg/l (1.899-15.00) versus 0.586mg/l (0.568-1.068) \text{ <0.001}]. Maximal percentage in PWA was also negatively correlated to CRP levels in patients \[r=-0.569, p=0.02\].

CONCLUSION: The present study showed that endothelial mediated vascular reactivity is impaired in COPD patients. Systemic inflammation probably plays an important role in causation of impaired vascular reactivity and increases the risk of cardiovascular disease in COPD patients.

RS06OP

LIVER FUNCTION TESTS IN PATIENTS OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE IN A TERTIARY CARE HOSPITAL.

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OBJECTIVES: To investigate the level of total bilirubin, alanine amino transferase (ALT/SGPT), aspartate amino transferase (AST/SGPT), alkaline phosphatase (ALP), serum ammonia, serum albumin. And correlation of these with FEV1 and FEV1/FVC ratio.

METHODOLOGY: In our present study we selected 56 cases of copd. All subjects were smokers and having FEV1<80% and FEV1/FVC ratio 70%. A group of 25 non-smoker healthy subjects selected as controls. Total bilirubin, s.ammonia, s.albumin and various enzyme levels such as alanine amino transferase (ALT/SGPT), aspartate amino transferase (AST/SGPT), alkaline phosphatase(ALP) were studied. FEV1 and FEV1/FVC ratio were correlated with LFTs. Comparison of various parameters were performed by’t’ test, correlation between two variables were
performed by Pearson’s correlation coefficient ‘r’.

RESULTS: Majority of patients (70%) had severe airflow limitation. Mean level of SGPT among cases were 117±10.23IU/L against controls who had mean SGPT 11.16±8.32 which was statistically significant (p<0.05). Likewise mean level of s.ammonia among cases were 154±10.22mcg/dl as compare to controls who had mean 24.43±7.97mcg/dl (p<0.05). However no significant difference in rest of the tests.

CONCLUSION: Smoking significantly affects liver function tests in patients of chronic obstructive pulmonary disease. Regular checkup is mandatory.

RS07OP

EFFECT OF LATE PREGNANCY ON PULMONARY FUNCTION TESTS IN MAHARASHTRA REGION.

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OBJECTIVES: Several changes have been reported in the maternal pulmonary function tests during pregnancy in different studies, however their results are contradictory. So a cross sectional study was undertaken to know the PFT changes in pregnancy.

METHODS: The study included 50 pregnant female in each trimester as cases and 50 non-pregnant female controls. FVC , FEV 1, PEFR and MVV, measured by computerized spirometer,”medspiror”, manufactured by Chandigarh. Their mean values were compared in between pregnant and non-pregnant women.

RESULTS: Our result shows significant decrease in FVC, FEV1 and MVV and non significant decrease in PEFR in the pregnant women when compared to non-pregnant women.

CONCLUSION: Chest wall and total respiratory compliance are also reduced at term. Anatomical changes due to enlarging uterus and hormonal changes in pregnancy affect the pulmonary function tests.

RS08OP

EXERCISE INDUCED BRONCHIAL LABIALITY: A COMPARISON BETWEEN NORMAL MEN AND WOMEN.

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OBJECTIVES: Pulmonary functions depend in normal individuals depend on the balance between lung recoil and chest elasticity, and the co-ordinated neuromuscular function of maintenance of effort, the thoracic and abdominal strength play important role in most of the pulmonary functions.

It has been reported that among young smokers, abnormalities in pulmonary function and risk of development of chronic bronchitis are greater among men than among women. Boys have increased tendency to wheeze with the viral respiratory infection when compared to girls. To study the difference of bronchial lability between normal men and women exercise test done.
METHODS: Preclinical medical students (M=30, F=30) of Lokmanya Tilak Municipal Medical College, Mumbai were assessed. Parameters compared were age, sex, height, weight & PFTs. Parameters were recorded with computerized spirometer & for PEFR Wright’s Mini Peak flow meter was used. Exercise lability index (ELI), ELI % rise & % fall calculated.

RESULTS: Lung volumes & flow rates in men are significantly higher. But greater ELI % rise in PEFR values in women during exercise & lesser decline means recovery is earlier in women as compared to men. Women have a greater increase and lesser decrease in flow rates as compared to men.

CONCLUSION: In women, it was recorded, during exercise, greater ELI % Rise of PEFR values & lesser decline. While in men lung volumes & flow rates were higher than that of women but ELI % Rise was less & fall was more than females.

RS09OP

STUDY OF PULMONARY FUNCTION TESTS IN PATIENTS OF RHEUMATOID ARTHRITIS AND TO ESTABLISH CORRELATION BETWEEN PULMONARY FUNCTION AND DISEASE ACTIVITY OF RHEUMATOID ARTHRITIS IN EASTERN INDIA.

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OBJECTIVES: To study pulmonary function tests in diagnosed Rheumatoid Arthritis cases, compare it with age sex matched apparently healthy control, and to see any correlation between lung function parameters and the disease activity.

METHODS: This study was conducted in the Physiology Department R.G.KAR Medical college & hospital Kolkata, included 100 randomly selected rheumatoid arthritis patients fulfilling ACR/EULA criteria-2010, 100 age sex matched apparently healthy control following inclusion/exclusion criteria. All subject were undergone history taking clinical examination, investigation (Hb-level, ESR, RF, CRP, ACPA of blood, Disease activity of RA done by DAS-28 Calculator, pulmonary function test with the help of computerized electronic spirometer, RMS–MEDSPIROR). Data analysis was done by chi-square test, pearson correlation test using SPSSv17 software.

RESULTS: Though pulmonary symptoms (presence of cough, phlegm, wheezing, and breathlessness) were reported by 34% patients this study shows that there is significant (p<0.05) restrictive type of lung disease (56%) and non significant (p>0.05) obstructive lung disease (11.3%) in cases compared to control. There is significant positive correlation between disease activity score(DAS) and FEV1/FVC%predicted (r=0.58,p<0.001), but PEFR% predicted (r= -0.48,p<0.05)n and FEV1% predicted(r= -0.675, p<0.001), is negatively correlated with DAS which is significant. FEV1/ FVC% predicted(r=0.58, p<0.001) has significant positive correlation where as FEV1% predicted (r=+0.664,p<0.001) has significant negative correlation with duration of disease.

CONCLUSION: This Study shows that rheumatoid arthritis patient has significant changes in pulmonary function parameters mainly of restrictive pattern and is correlated
with duration of disease, disease activity. So routine screening by PFT may reduce mortality and morbidity of rheumatoid arthritis patients due to subclinical or overt pulmonary dysfunctions.

**RS10OP**

**EFFECT OF DURATION OF EXPOSURE OF BIOMASS FUEL COMBUSTION ON PULMONARY FUNCTION TESTS.**

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**OBJECTIVES:** To find out the effect of biomass fuel combustion in relation to age and duration of exposure on pulmonary function tests

**METHODS:** Study was conducted on 300 women of the age-group 21-50yrs, further categorized on the basis of duration of exposure as:

- Group 1: 21-30yrs with exposure of 1-10yrs.
- Group 2: 31-40yrs with exposure of 11-20yrs.
- Group 3: 41-50yrs with exposure of 21-30yrs.

Each group comprised of 50 women forming the study group with atleast 3-4hrs daily exposure and 50 age-matched healthy control group. The equipment used for recording pulmonary function tests was computerized spiro excel (Medicaid system, Chandigarh). And the data was tabulated and analysed by SPSS version.

**RESULTS:** The mean values of FEV1/FVC and PEFR in all 3 groups of controls and cases are as follows:

<table>
<thead>
<tr>
<th>Group</th>
<th>FEV1/FVC</th>
<th>PEFR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>96.1±1.74; 83.61±9.05</td>
<td>9.29±1.24; 2.8±1.4</td>
</tr>
<tr>
<td>Group 2</td>
<td>96.1±1.74; 79.57±11.22</td>
<td>9.29±1.24; 2.43±1.23</td>
</tr>
<tr>
<td>Group 3</td>
<td>93.5±4.07; 76.45±12.15</td>
<td>8.9±1.22; 1.85±0.46</td>
</tr>
</tbody>
</table>

**CONCLUSION:** As the duration of exposure increases the FEV1/FVC and PEFR values decreases significantly.

**RS11OP**

**OBESITY IN COPD OR COPD WITH OBESITY “A COMPLEX WEB”: STUDY OF PROINFLAMMATORY MARKERS IN OBESE AND NON OBESE COPD PATIENTS.**

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COPD has widespread systemic manifestations. Inflammation plays important role in its pathophysiology. Aim of the present study was to check our hypothesis that mild COPD has lower oxidative stress and inflammation but at same time obesity contributes to inflammatory processes and results in lung function decline. The levels of proinflammatory cytokines CRP, IL6 and TNF α was compared between obese and non obese subjects (30 subjects in each group) by applying student’s t test. Oxidative imbalance was assessed by doing MDA and FRAP assays in same subjects. Correlation of BMI with the above study parameters was analyzed using
Pearson’s test. Results indicated that levels of CRP, IL6 and TNF α were elevated in obese group as compared to non obese group (p<0.001). Total antioxidant capacity estimated by FRAP assay was lower (p=0.005) but the levels of oxidants estimated indirectly by MDA was higher (p=0.01) in obese COPD patients. In all COPD patients BMI correlated inversely with FRAP (r=-0.546, p=0.013), FVC (r=0.548, p=0.012) and FEV1 (r=-0.865, p<0.001). Similarly BMI correlated positively with markers of inflammation namely CRP (r=0.526, p=0.017), IL6 (r=0.865, p<0.001), TNF α (r=0.653, p=0.002). Positive correlation of BMI was found with MDA (r=0.536, p=0.015). Conclusion: there is higher inflammation in obesity resulting in increase oxidative activity which causes decline in total antioxidant capacity which in turn contributes to lung function decline.

**Keywords:** COPD, Obesity, Inflammation, Total Anti Oxidant Capacity, BMI

**RS12OP**

**EFFECT OF MODERATE AEROBIC EXERCISE TRAINING ON PULMONARY FUNCTIONS AND ITS CORRELATION WITH ANTIOXIDANT STATUS.**

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**OBJECTIVES:** The aim of the present study was to see the effect of moderate aerobic exercise training on pulmonary functions and its correlation with antioxidant status.

**METHODS:** 30 healthy volunteers in the age group of 18-22 years were screened. They underwent short term moderate aerobic exercise training. Various Pulmonary function tests including FVC, MVV &SVC were taken pre and post aerobic exercise training. Antioxidant status was assessed by the level of malondialdehyde in plasma.

**RESULTS:** FVC showed a significant increase while PEFR, IRV, MVV and MRF showed a highly significant increase. Physical exercise also provides a favourable change in the biochemical parameters such as MDA. Significant correlation was observed between TV and plasma MDA level.

**CONCLUSION:** The current study indicates that moderate aerobic exercise training is beneficial in improving the pulmonary functions and the antioxidant status.

**RS13OP**

**RAPIDLY ADAPTING RECEPTORS (RARs), OXIDATIVE STRESS (OS) AND AIRWAY HYPERRESPONSIVENESS (AHR)**

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**OBJECTIVES:** To assess the role of OS in the responses of RARs to ovalbumin (ova) challenge and histamine in sensitized guinea pigs.

**METHODS:** Guinea pigs were divided into three groups of six each. Group 1 served as control. Groups 2 and 3 were sensitized with ova for four weeks. Group 3 alone was fed with vitamin E (7 mg/kg) and vitamin C (2 mg/kg) for four weeks. In all, the responses of RARs to an inhalations of saline in Group 1 and ova in
Groups 2 and 3 for 1 min were investigated. After recovery, increasing doses of histamine were given until the airway resistance increased by 50% (ED$_{50}$ dose) and the corresponding RAR activity was recorded. Blood was collected for determining OS.

**RESULTS:** Compared to Group 1, the basal RAR activity was increased in Groups 2 and 3. Saline inhalation did not stimulate the RARs in Group 1. Ova challenge stimulated them significantly in Groups 2 and 3; however, the response was significantly lower in Group 3 compared to Group 2. Compared to Group 1, the ED$_{50}$ histamine dose was reduced significantly in Group 2 indicating AHR. Even this dose produced a greater stimulation of the RARs in Group 2, compared to Group 1. The responses in Group 3 were similar as in Group 1. OS evidenced by increased lipid peroxidation and decreased glutathione peroxidase observed in Group 2 was reversed partially in Group 3.

**CONCLUSION:** OS contributes to AHR, increase in RAR activity and their response to histamine.

**RS14OP**

**EVALUATION OF MAXIMAL MID EXPIRATORY FLOW RATE ( FEF 25-75%) IN HEALTHY YOUNG ADULTS OF NORTH EAST.”**

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**OBJECTIVES:** To assess the Mid expiratory flow rate ( FEF 25-75%) in healthy young adults and to find out whether there is any relation of MEF with increase in body mass index in males and females.

**METHODS:** The study was carried out on 200 young healthy adults in the age group of 18 to 20 years (male 130, female 70). Height, weight, and BMI, were measured. Pulmonary function tests MEF 25-75% was recorded using a portable computerised spirometer---Medspiror

**RESULTS:** In males with BMI <18.5, 18.5 – 22.9, 23-24.9, 25 – 29.9 and >30 ie groups A,B,C,D,E - MEF is found to be 337.5 ±23, 347.90 ±45, 326.80 ±24, 314.3 ±26.30, 314.6 ±17 respectively.

In female with BMI <18.5, 18.5 22.9, 23-24.9, 25 – 29.9 and >30 ie groups A,B,C,D,E - MEF is found to be 273.2 ±18, 277.7 ±28, 258.15 ± 18.14, 232.7 ±13, 228 ±9.6 respectively. When data was compared between the male groups - MEF decreased significantly (p<0.001) between group A and D, A and E, B and C, B and E, B and D, C and E.

When the data were compared between the female BMI groups it was found that MEF decreased significantly (p<0.05) between group A and E, B and C, B and D, B and E, C and D, C and E.

The MEF is found to be lower in females than males, MEF decreases with increase in BMI in both the sexes.

**RS15OP**

**A CORRELATIVE STUDY OF RESPIRATORY & ANTHROPOMORPHIC PARAMETERS IN FEMALES OF GAHRWAL REGION.**

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**OBJECTIVE:** Pulmonary function are known to vary with a number of physiological parameters like age, height, arm span weight and body surface area. The present work was conducted to assess & study the pulmonary functions & study there correlation with age, height, weight, arm span and other respiratory parameters in adult females of Garhwal region.

**RESULTS:** PEFR in total subjects was between 300 to 480 L/min. Mean PEFR value observed was highest in younger age group with a subsequent decline with increase in age in the other age groups. The maximum expiratory pressure (MEP) declined gradually with increase in age. Respiratory endurance time (RET) & Breath holding time also showed similar variation. Further, correlation of PEFR with all anthropomorphic parameters under study was statistically significant except with weight. Correlation of PEFR with respiratory parameters was statistically significant. Regression equations for peak flow rate for a given value of height in different age group was derived and estimated flow rates using the prediction formulas were calculated.

**CONCLUSION:** It can be concluded that predicted values of PEFR were very close to the observed values and can be used as reference values in the female population of Garhwal. The present study is first of its kind where PEFR has been reported on women of Uttarakhand. This work has been done in anticipation of the usefulness of these prediction values for clinical purposes wherever required.

**PH01 OP**

**COMPARISON OF ANTI-INFLAMMATORY ACTIVITY OF TERMINALIA ARJUNA BARK EXTRACT WITH DICLOFENAC FOR ACUTE INFLAMMATION ON RATS.**

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**OBJECTIVES:** Terminalia arjuna is a well known medicinal plant whose bark is extensively used in ayurvedic medicine as anti-inflammatory agent. It is one of the most versatile medicinal plants having a wide spectrum of biological activity. The aim of this study is to explore the use of Terminalia arjuna on pharmacological grounds for evaluation of anti-inflammatory activity.

**METHODS:** The anti-inflammatory activity of Terminalia arjuna was studied against carrageenan-induced hind paw edema in rats and compared with Diclofenac sodium. The aqueous extract of Terminalia arjuna bark (TA) was administered at the concentrations of 200, 400 and 800mg/kg body weight.

**RESULTS:** TA showed significant (p<0.05) anti-inflammatory activity by reducing the edema volume in carrageenan-induced paw edema in rats at a dose of 400 mg/kg at 6 and 24 hrs postdosing. 800 mg/kg TA produced an insignificant reduction of edema at 24 hrs post dosing showing a dose dependant and significant effect at different time intervals.

**CONCLUSION:** These results show that the aqueous bark extract of T. arjuna possesses anti-inflammatory activity against acute inflammation processes, in support of the medicinal use of the plant. Terminalia arjuna bark may be a potential preventive or
therapeutic candidate for the treatment of acute inflammation and arthritis.

PH02OP

HEPATOПROTECTIVE EFFECT OF STEM
BARK OF ACACIA CATECHU IN CCl4
INDUCED HEPATOTOXICITY IN RATS

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OBJECTIVES: To evaluate the
hepatoprotective activity of ethanolic extract
of stem bark of Acacia catechu in CCl4
induced hepatotoxicity in albino wistar rats

METHODS: The ethanolic extract was
prepared by Soxhlet extraction method. Albino wistar rats of either sex weighting
100-250 g were divided into 5 groups of 6
animals each. Group I –control, group II-
Positive control-silymarin (50mg/kg) +CCl4
(1mg/kg), Group III- Negative control
received CCl4, Group IV and V received
CCl4(1mg/kg) and ethanolic extract of acacia
catechu (ACEE) in a dose of 200 and
400mg/kg/day orally respectively for 7 days.
On 8th day animals were sacrificed and blood
was collected for assessment of biochemical
parameters AST,ALT, ALP, Total Bilirubin.

RESULTS: ACEE (200mg/kg and 400mg/kg )
showed significant reduction of
AST,ALT,ALP,Total Bilirubin as compared to
negative ( CCl4) control group.

CONCLUSION: The ACEE showed significant
dose dependent protection against carbon
tetrachloride induced liver injury in rats.

PH03OP

ANTIOXIDANT POTENTIAL AND
NEPHROПROTECTIVE ACTIVITY OF
Bauhinia Purpurea LINN IN ACUTE
KIDNEY INJURY ( AKI ) PRODUCED BY
GENTAMICIN IN EXPERIMENTAL ANIMALS.

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OBJECTIVE: To study the nephroprotective
activity of ethanolic extract of Bauhinia
purpurea (BPEE) pods against gentamicin
produced AKI in albino wistar rats.

METHODS: Twenty four healthy adult albino
rats of either sex (150-200 g) were randomly
divided in four groups of six animals each.
Group I served as normal control (vehicle)
and Group II as negative control (gentamicin
80 mg/kg/d, i.p. for 8 days). Group III and IV
(test groups) were administered with BPEE
(200 and 400 mg/kg/day p.o) 1 hour prior to
gentamicin (80 mg/kg/day, i.p.) for 8 days.
On 9th day blood and urine samples were
used for biochemical parameters and kidneys
for histology and antioxidant test.

RESULTS: Gentamicin caused nephrotoxicity
as evidenced by marked elevation of blood
urea, serum creatinine, blood urea nitrogen
and urine glucose and decreased creatinine
clearance in Group II as compared to Group I.
Administration of BPEE in group III and IV
caused a dose dependant reduction in the rise
of blood urea, serum creatinine, blood urea
nitrogen and urine glucose and an increase in
creatinine clearance as compared to group II.
In case of antioxidant status there is
significant increase in SOD, Catalase, GSH
enzymes and decrease MDA level. These
findings were confirmed by histopathological examination.

**CONCLUSION:** Ethanolic extract of Bauhinia purpurea pods has nephroprotective activity against gentamicin induced acute kidney injury in rats.

**PH04OP**

**SCREENING OF HEPATOPROTECTIVE ACTIVITY OF ETHANOLIC EXTRACT OF STEM BARK OF BAUHINIA VARIEGATA IN RATS.**

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**OBJECTIVES:** To study the hepatoprotective activity of ethanolic extract of stem bark of Bauhinia variegata.

**METHODS:** Albino wistar rats of either sex weighing 150-200g divided into six groups (n=6). Group I served as control and received distill water only. Group II was given carbon tetrachloride 1 ml/kg/d dissolved in olive oil (1:1) orally. Group III received CCl4 (1ml/kg) + silymarin(100mg/kg) orally, Groups IV-VI received CCl4 (1ml/kg) and ethanolic extract (BVEE) of stem bark of Bauhinia variegata in the doses of 100, 200 ,400 and 600mg/kg/day orally, respectively. Treatment was given daily for 7 days. The hepatoprotective effect of the extract was evaluated by assessment of biochemical parameters [Aspartate aminotransferase (AST), Alanine aminotransferase (ALT), alkaline phosphatase (ALP) and total bilirubin] and histopathological examination of liver.

**RESULTS:** BVEE (400mg/kg and 600mg/kg) exhibited highly significant (p<0.001) reduction in AST and ALT, ALP and total bilirubin. BVEE (200mg/kg and 100mg/kg) exhibited highly significant (p<0.001) reduction in AST, ALT and ALP, significant reduction (p<0.05) in total bilirubin. Histopathological examination of the liver suggested hepatoprotective effect of the extract by decreasing the extent of centrilobular necrosis, fatty changes and congestion of sinusoids when compared to carbon tetrachloride group.

**CONCLUSION:** The BVEE showed significant dose dependent protection against carbon tetrachloride induced liver injury in rats.

**PH05OP**

**STUDIES ON THE ANTI-INFLAMMATORY AND IMMUNOMODULATORY ROLE OF THEOPHYLLINE IN ANTIGEN-INDUCED ASTHMA IN RATS**

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**OBJECTIVES:** To evaluate the anti-inflammatory and immunomodulatory role of theophylline in ovalbumin-induced asthma in rats.

**METHODS:** The study was conducted on Wistar rats (200-250 gm) 6 animals per group. All animals were immunized on day ‘0’ with 2 mg/kg ovalbumin (OVA) in Freund’s complete adjuvant and they were divided into experimental and control groups. From day 15 each animal was challenged with the antigen aerosol by nabulization and subsequently theophylline treatment was done upto 21 days. The serum and mesentries
were collected for the analysis of IgE levels and inflammatory (TNF-α) and anti-inflammatory (IL-4) cytokine levels and mast cell degranulation respectively. All the data were analysed by one-way ANOVA and p<0.05 was considered as level of significance.

RESULTS: The present studies showed the anti-inflammatory and immunomodulatory effects of theophylline on ovalbumin-induced asthma in rats. Pretreatment with theophylline 10 mg/kg significantly (p<0.05) decreased ovalbumin-induced elevated levels of a) IgE antibody b) TNF-α cytokine levels c) number of mesentric mast cell degranulation. The theophylline pretreatment significantly reversed decreased anti-inflammatory (IL-4) cytokine levels as compared to non-treated control group. At higher dose of theophylline (20 mg/kg) these immunological parameters were further reversed significantly (p<0.001).

CONCLUSION: The results of the present studies suggest the anti-inflammatory and immunomodulatory role of theophylline, a non-specific phosphodiesterase (PDE) inhibitor in ovalbumin-induced asthma. The protective mechanism of theophylline in asthma may be mediated through anti-inflammatory and immunomodulatory cytokine network and may have role in other inflammatory disorders such as rheumatoid arthritis.

PH06OP

MORBIDITY PROFILE AND DRUG UTILIZATION PATTERN IN ALLERGIC DISEASES IN SKIN OUTPATIENTS IN ATERTIARY CARE TEACHING HOSPITAL AT DEHRADUN, UTTARAKHAND

Shaktibala Dutta, Mirza Atif Beg, Anil Kumar Mehta, Santosh Kumar*
131(28.11%) FDCs were irrational and can be avoided.

**CONCLUSION:** It is the need of the time, prescribers should be made aware of the demerits of irrational prescribing and they should be cautious and vigilant whenever prescribing FDCs.

**PH07OP**

**STUDY ON DRUG PRESCRIBING PATTERN IN HYPERTENSIVE PATIENTS IN A TERTIARY CARE TEACHING HOSPITAL AT DEHRADUN, UTTARAKHAND**

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**OBJECTIVES:** Irrational prescribing is common practice globally; it results in increase morbidity, mortality and economical burden on society. Drug utilization studies are important tool to promote the rational prescribing.

**METHODS:** A prospective drug utilization study was conducted in hypertensive patients by the department of pharmacology in medicine OPD at SGRRIM&HS, Dehradun for 6 months. 645 prescriptions were evaluated for prescribing pattern using WHO drug indicator and Essential drug list.

**RESULTS:** A total of 645 prescriptions were evaluated, 354(54.88%) were females and 291(45.12%) were males, mean age was 54.14yrs, height 161.56cm, weight 67.98kg respectively. Majority of the patients were vegetarian 448(69.46%), married 620(96.12%), housewife 342(53.02%) and belongs to middle socioeconomic group 533(82.64%). H/o coexisting diseases were Diabetes 174(26.98%), hypothyroidism 114(17.67%), Coronary artery disease 18(2.79%), bronchial asthma 14(2.17%) and family history was positive in 226(35.03%) patients. Total 1828 drug were prescribed, antihypertensive 697(38.13%), statins 154(23.88%), hypoglycemics 243(13.30), thyroid hormone 114(6.24%), NSAIDs 174(9.52%), antianxiety/antidepressants 54(2.95%) and other 392(21.44%). Oral formulations 1781(97.43%), 2.83 drugs/prescription, 100% drugs are prescribed by brand names, FDCs(fixed dose combination) was prescribed to 300(46.51%) patients. Most frequently prescribed antihypertensive drugs were ARBs 234(36.28%), ACEIs 117(18.14%), Beta blockers 95(14.73%), calcium channel blockers 83(12.87%) respectively, 168(26.05%) FDCs were also used. Results revealed that most of the prescriptions were rational, but further improvement needed.

**CONCLUSION:** Most commonly, prescribed antihypertensive agents were ARBs and ACEIs, coexisting diseases were diabetes and hypothyroidism, and co-prescribed drugs were hypoglycemics, statins, thyroid hormones. Rational prescribing requires consideration to dose and duration as well as interaction with other medications.

**PH08OP**

**ADVERSE DRUG REACTION MONITORING IN PSYCHIATRY OPD OF A TERTIARY CARE TEACHING HOSPITAL**

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OBJECTIVES: To study the pattern of adverse drug reactions (ADR) in patients attending psychiatry OPD of a tertiary care teaching hospital.

METHODS: A total number of 61 patients attending psychiatric OPD with ADRs due to drugs prescribed for various psychiatric illnesses over a period of 6 months were included in the study. Adverse event history, medication history and other relevant details were entered in the CDSCO format as adopted in the Pharmacovigilance Programme of India (PvPI). Causality was assessed by WHO criteria.

RESULTS: A total of 73 ADRs were reported from 61 prescriptions. Majority of ADRs (61.6%) were seen with antidepressants as they were the commonly prescribed drugs followed by antipsychotics (35.6%) and rest by sedative hypnotics as well as antiepileptics. The reported ADRs were assessed for causality. ADRs like increased sleep topped the list (31.5%) followed by weight gain (28.8%), decreased appetite (5.5%) and akathesia (5.5%).

CONCLUSION: Maximum ADRs were seen with antidepressants followed by antipsychotics. Sedation and weight gain were the most commonly occurring ADRs.

PH09OP

COMPARATIVE EVALUATION OF MODERATE DOSE INHALATIONAL CORTICOSTEROID (ICS) FLUTICASONE WITH THE COMBINATION OF LOW DOSE FlUTICASONE AND MONTELUKAST IN MODERATE PERSISTENT BRONCHIAL ASTHMA

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BACKGROUND: Use of inhaled corticosteroids (ICS) are recommended in all grades of persistent asthma and once the symptoms are stabilized, “stepping down” of steroids is recommended to minimize their unwanted effects with the addition of a second medication with a complimentary mechanism of action.

OBJECTIVES: In our study a comparison of moderate dose ICS Fluticasone in “stepping down” strategy with combination of low dose Fluticasone with once-daily montelukast were assessed.

METHODS: 50 patients with moderate persistent asthma were randomly assigned in study. Initially stabilized on fluticasone propionate(FP) 250µg twice daily, for four weeks, there after patients were given the medication as per the protocol (Group-I (n=25)-fluticasone 250μg BD, Group-II (n=25)-fluticasone125µg BD+Montelukast 10mg at bed time). Patients were then followed up for 12 weeks. The primary efficacy variables were changes in FEV1%, PEFR%,ACS (asthma control symptom)score and asthma quality of life (QOL) score.

RESULTS: Changes in lung function at the end of study in Group-I and Group-II respectively as compared to 0 week (baseline) values, FEV1% value (p*<0.05,p*<0.05), PEFR%
value(p**<0.01, p*<0.05), ACSscore(p**<0.01, p*<0.05), AQOLscore(p*<0.05, p*<0.05). ICS fluticasone 250µg BD and low dose fluticasone 125µg BD + Montelukast 10mg at bed time are equally efficacious in improving lung functions, asthma symptoms and QOL. Montelukast group was a little less expensive with fewer adverse events.

**CONCLUSION:** Moderate dose fluticasone did not show any benefit over combination of low dose fluticasone and Montelukast 10mg in night. Montelukast 10mg in combination with low dose fluticasone can be an alternative in moderate persistent asthma.

**PH10OP**

**A DRUG UTILISATION STUDY IN PATIENTS WITH RHEUMATOID ARTHRITIS AT A TERTIARY CARE HOSPITAL**

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**OBJECTIVES:** To determine the drug utilisation pattern in patients with Rheumatoid Arthritis (RA) attending the immunology OPD.

**METHODS:** The study was conducted in patients with RA attending immunology OPD in Dayanand Medical College & Hospital, Ludhiana for a period of 6 months w.e.f 1st October, 2010 to 31st March, 2011.

**RESULTS:** Out of total 230 patients who attended the OPD, 116 had RA. The median age was 47 years with a female preponderance (78.4%). Among these, 39.6% belonged to upper middle class. Total no. of drugs prescribed were 715 (including 169 DMARDs). The average drugs per prescription were 6.16 and average DMARDs and anti-inflammatory per prescription were 1.5 and 0.74. The drugs prescribed included, NSAIDs (100%), DMARDs (93.75%) and Corticosteroids (71.25%). Among NSAIDs, Diclofenac (32.5%) was the most commonly prescribed followed by Etoricoxib (25%), Paracetamol (22.5%), Etodolac (13.75%), Naproxen (5%). DMARDs given as monotherapy were Methotrexate (31.25%), Hydroxychloroquine (5%), Sulfasalazine (2%) and Leflunomide (1.25%). Among DMARDs, combination of Methotrexate and Hydroxychloroquine was preferred (41.25%). Other drugs that were prescribed were Folic acid, Calcium, Escitalopram, Proton-pump inhibitors and Vitamin D. Maximum drugs were prescribed by oral route, only 2.5% patients were given injectables and 32.5% drugs were prescribed by generic name.

**CONCLUSION:** NSAIDs were prescribed to all patients along with DMARDs and Corticosteroids. The most common NSAID prescribed was Diclofenac and the most common DMARD prescribed was Methotrexate. Nutritional supplements like calcium and vitamin D were given to large number of subjects.

**PH11OP**

**PRESCRIBING TRENDS FOR ACUTE DIARRHOEA IN CHILDREN IN TERTIARY CARE GOVERNMENT VERSUS PRIVATE CARE HOSPITALS**

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OBJECTIVES: To analyse adherence of prescribers working in tertiary and private care hospitals to standardized guidelines for childhood diarrhoea

METHODS: Study design: Cross sectional study carried out between 5th June to 27th September

Prescriptions were collected randomly from O.P.D of paediatric department of Government Medical College and private paediatric hospitals in the city of Amritsar. Data collected were tabulated and analysed based upon core indicators provided by W.H.O.

RESULTS: A total of 167 prescriptions of acute diarrhoea were collected from 2 different set ups and 156 prescriptions were analysed, 11 prescriptions of dysentery were excluded from the study. In Government Medical College O.R.S and Zinc was prescribed in 106 (100%), antibiotics in 16 (15%), probiotics in 5 (5%), injectables in 2% (2) and anthelmintics in 11 (10%) prescriptions.

In private paediatric hospitals O.R.S was prescribed in 25 (50%) and Zinc in 20(40%), antibiotics in 48 (95%), probiotics in 50 (100%), injectables in 8 (15%), antiemetics in 13 (25%) and anthelmintics and antiprotozoals in 25 (50%) prescriptions.

CONCLUSION: There is a need of creating awareness in practitioners working outside teaching institutions about standard treatment guidelines and W.H.O criteria for treatment of acute diarrhoea in children.

PH12OP

TO MONITOR AND RECORD SKIN MANIFESTATIONS OF ADVERSE DRUG REACTIONS (ADRS) OF SOME COMMONLY PRESCRIBED DRUGS IN OPDs OF CHATRAPATI SHIVAJI SUBHARTI HOSPITAL, MEERUT( UP)

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OBJECTIVES: To monitor and record skin manifestations of adverse drug reactions (ADRs) of some commonly prescribed drugs in OPDs of Chatrapati Shivaji Subharti Hospital, Meerut( UP)

METHODS: This was an observational study conducted in various OPD like Medicine, Surgery, Orthopedics, Dermatology, Psychiatry, ENT, Gynecology & Obstetrics. All these OPDs were visited for total duration of one year from Oct.2011 ---- May 2012 for ADR monitoring. ADRs were reported in standard CDSCO ADR forms.

WHO probability scale and Naranjo’s algorithm were applied to assess the causality of the reported ADRs. Modified Hartwig and Seigel scale was applied to assess the severity and Modified Shumock and Thonton scale for assessing the probability.

All the data was tabulated and results expressed in percentage.

RESULTS: A total of 420 filled ADR forms were collected and analysed. Of all the ADRs reported, 33% were in the category of mucocutaneous manifestations viz. rashes, fixed drug eruptions, urticaria, angioedema. Common drugs responsible for these adverse reactions belonged to NSAIDs, Fluoroquinolones, Cotrimoxazole, Cephalosporins, Chloroquine, Nitroimidazole group.
CONCLUSION: Mucocutaneous reactions were the commonest ADRs reported in our study. Main group of drugs implicated were NSAIDs and antimicrobials. Hence utmost care must be taken while prescribing these drugs.

PH13OP

ACUTE MOUNTAIN SICKNESS (AMS) IN MOUNTAIN MOTOR BIKERS IN KHARDUNGLA PASS: A PILOT STUDY

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OBJECTIVES: To study the incidence of AMS in mountain motor-bikers at KhardungLa pass.

METHODS: Lake Louise AMS (LLAMS) score questionnaire was administered to 108 bikers for Leh (3524meters) and KhardungLa(5602meters) route. Mean heart rate (MHR), pa O2 and time taken for ascent from Leh to Khardungla was recorded. Symptoms of AMS were compared by Wilcoxon signed Rank Sum test; number of riders with symptoms was compared using a Chi square test.

RESULTS: 108 out of 123 bikers gave consent to participate. Time to fill up LLAMS ranged from 5-10 minutes. Time to ascend from 3524meters to 5602meters ranged from 1:30hr – 3.00 hrs. Duration of stay by riders at Khardungla ranged from 45-90minutes. Mean heart rate (resting) at Khardung La was 101.3 beats per minute, 78% had MHR of ≥90, only 32% had a pO2 of ≥80 mm Hg; 13 (12%) had AMS (7-moderate, 6-severe) at KhardungLa compared to 9 riders (8.4%) in Leh (5-moderate, 4-severe). More riders had symptoms at KhardungLa (16.6% vs30.8%) including headache (8.4 v/s 19.6%) and dyspnoea (2.8 v/s 13.1%).This trend was not significant (p>0.05). Headache was the most common symptom followed by fatigue, dyspnoea and dizziness at 5359meters.None of the bikers had to be given O2 or other treatment.

CONCLUSION: Motorbike ride from 3524 to 5602 metres did not increase mean score or incidence of AMS. However a trend showed more symptoms. None of the bikers had to abandon the journey. It can be explained by less physical exertion during motor biking and shorter duration of stay at KhardungLa.

PH14OP

OPEN BOOK EXAMINATION FOR FORMATIVE EVALUATION IN TEACHING PHARMACOLOGY TO MEDICAL GRADUATES

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METHODS: The students were acclimatized by giving them practice sessions. They were briefed that they will be assessed for their understanding, rather than remembering and are required to apply, analyze, evaluate and synthesize or structure solutions. A test was announced and 5 days were given to prepare. A list of 65 questions was prepared and from which 25 were selected for the test. The students were asked to bring any book or
reading material. They were permitted to discuss the given problems to answer the question. After the completion of exam the students were administered a 12 item questionnaire on three point scale (agree-2, not sure-1, disagree-0). They were asked to tick the option which reflects their views on the given statement related to this learning-evaluation activity.

**RESULTS:** Test absenteeism was decreased from 40.66\% to 8.33\%; more students improved the scores (p<0.05). It helped in reading the books (89.4\%), understanding the subject (72.9\%), influenced attitude to solving the problems (76.4\%), helped in diagnosing strengths & weakness (77.6\%), helped to find solution to problems (76.47\%). Only 20\% felt examination stress, where as 35.9\% disagreed and 44\% were not sure of stress.

**CONCLUSION:** Open book test is applicable for formative assessment of students. It is acceptable, decreases test absenteeism, improves score, help to deal with the explosion of information and prepare the subject and is less stressful.

**PH15OP**

**COMPARISON OF INTRAVENOUS SIMULATION MODEL WITH CRITICAL EVALUATION OF PROMOTIONAL LITERATURE FOR TEACHING PHARMACOLOGY TO MEDICAL GRADUATES**


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**OBJECTIVES:** Compare teacher's opinion on two exercises: intravenous simulation with critical evaluation of literature for teaching pharmacology to medical graduates.

**METHODS:** 60 teachers were briefed and demonstrated the two new teaching learning activities for teaching of practical pharmacology to medical graduates. In the first: vein is simulated by rubber tubing and mounted in a long glove filled by cotton wool or placed on a wooden board. Drug vials are simulated by different colored fluids. Dilution will be prepared and infusion set up as per body weight given .In the second exercise a brief introduction of different aspects of drug promotion are given. Parameters based on Organization of Pharmaceutical Producers of India (OPPI) Guidelines for printed material and advertisements are provided. Based on these students are asked to evaluate the advertisement.

The teachers were asked to rate the two exercises on feasibility, time required, need of help to students doing practical, number of teachers and seats required for a group of 50 students, variety of topics that can be covered, fulfilling Medical Council of India Curriculum Guidelines, cost to the institution.

**RESULTS:** Both are as per MCI Curriculum goals, feasible, do not need CTRI or CPSCEA clearance, cost effective, and need teacher’s assistance. More than 90\% believed that these exercises need teachers’ motivation, 2-4 teachers and 20- 25 work stations for a batch of 50. Cognitive, affective and psychomotor domains are likely to be benefitted by
intravenous drip set simulation whereas with critical evaluation of promotional literature mainly cognitive domain is likely to be benefitted.

CONCLUSIONS: These are useful and feasible teaching learning activities and should be incorporated in practical exercises for pharmacology teaching of medical graduates.

PH16OP

CLINICAL CASE FOLLOW UP STUDY-A METHOD OF TEACHING CLINICAL PHARMACOLOGY TO THE MBBS STUDENT

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OBJECTIVES: To impart clinical pharmacology knowledge to the MBBS 2nd professional students.

METHODS: A total no. of 150 cases were followed up by the undergraduate students during 2nd professional MBBS in the department of pharmacology at SGRRIM&HS, Dehradun. Patients were analyzed on various parameters using WHO Drug used indicators and National List of Essential Medicines.

RESULTS: A total of 150 cases were evaluated, 115(76.66%) were male and 35(23.34%) were female, majority patients 124(82.66%) were 16-45 years of age. Morbidity pattern was observed as infectious diseases 100(66.66%) and non-infectious 50(33.34%) respectively. Among infectious diseases fever 40(40%), acute-gastroenteritis 27(27%), tuberculosis 11(11%) and urinary tract infection 9(%) were most frequently observed, and non-infectious disease were epilepsy 11(22%), hypertension 7(14%) and gasteroesophageal reflux disease 7(14%) respectively. A total of 491 drugs were prescribed, 433(88.18%) were oral, 58 (11.82%) injectable formulations were used, 145(96.66%) patients were prescribed more than one drug, 29 FDCs were used. 3.45 drugs and 3.00 drugs per prescription were prescribed for infectious and non-infectious disease respectively. Antibiotics 189 (38.49%), NSAIDs 78 (15.88%), antiepileptics 19(3.86%) and antihypertensive 18 (3.66%) were most commonly prescribed drugs.

CONCLUSION: Clinical case follow-up study can be introduced as a tool for imparting knowledge of clinical pharmacology to undergraduate MBBS student.
CA01PP

HIGH FREQUENCY YOGA BREATHING INCREASES ENERGY EXPENDITURE FROM CARBOHYDRATES.
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OBJECTIVES: This study evaluated the effect of HFYB on energy expenditure and contributions of dietary components to the energy expenditure.

METHODS: The participants were forty-seven healthy males, age ranged between 17 and 35 years (group mean ± S.D., 23.2 ± 4.1 years). The average B.M.I. (±S.D.) was 22.5 ± 2.9 Kg/m². Every participant was assessed during HFYB and breath awareness (BAW) as interventions on two separate days. The sequence of practice was reversed for alternate participants. Assessment of energy expenditure per min (EEm), energy derived from carbohydrate (CHOkc) and fat (FATkc) was done using an open circuit oxygen consumption analyzer (Quark CPET, COSMED, Italy).

Each session lasted for 35 minutes. Repeated measures analyses of variance (ANOVA) followed by post-hoc analyses with Bonferroni adjustment were done to compare data recorded during and after the two practices with data recorded before the two practices, using PASW Version 18.0.

RESULTS: Energy expenditure increased significantly (p<0.001) during HFYB compared with pre HFYB. When compared with pre HFYB, energy derived from carbohydrate (CHOkc) significantly increased (p<0.001) during HFYB, reduced significantly post HFYB (p<0.001) and energy derived from fat (FATkc) increased significantly (p<0.001) post HFYB. A significant reduction (p<0.05) in energy derived from fat (FATkc) was found during BAW compared with pre BAW.

CA02PP

BLOOD PRESSURE AND PURDUE PEGBOARD SCORES IN INDIVIDUALS WITH HYPERTENSION AFTER ALTERNATE NOSTRIL BREATHING, BREATH AWARENESS, AND NO INTERVENTION.
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OBJECTIVES: Previously alternate nostril yoga breathing (anuloma-viloma pranayama) was shown to reduce the blood pressure (BP) in people with hypertension. An elevated BP has been associated with poor performance in certain tasks requiring attention and co-ordination. The Purdue pegboard task assesses manual dexterity and eye-hand co-ordination.

METHODS: In the present study there were ninety participants with essential hypertension. Their ages ranged from 20 to 59 years (group average age ± S.D., 49.7 ± 9.5 years; sixty males). Participants were randomized as three groups, with thirty participants in each group. One group
practiced alternate nostril yoga breathing for 10 minutes, the second group practiced breath awareness for the same duration and the third group was given a control intervention (i.e., reading a magazine with neutral content). Assessments were taken before and after the interventions for participants of the three groups. Assessments included the blood pressure and performance in the Purdue pegboard task. Data were analyzed with repeated measures ANOVA and post-hoc analyses were Bonferroni adjusted.

RESULTS: Following alternate nostril breathing (ANYB) there was a significant decrease in systolic and diastolic blood pressure (p<0.001 and p<0.05), and an improvement in Purdue pegboard task scores for both hands (p<0.05), and for the right hand (p<0.001). Breath awareness (the control session) also showed a significant decrease in systolic blood pressure (p<0.05). The right hand scores improved in the group of reading a magazine (p<0.05).

CONCLUSION: The result suggests that the immediate effect of ANYB is to reduce the BP while improving the performing in a task requiring attention, bimanual dexterity and visuo-motor co-ordination.

CA03PP

A SHORT TERM INTEGRATED YOGA PRACTICE IMPROVES THE QUALITY OF LIFE.

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BACKGROUND: The present age of speed and competition has increased the stresses and strains resulting in an increasing prevalence of lifestyle-related health problems. Yoga is emerging as an important health behavior-modifying practice to achieve states of health, both at physical and mental levels. Only a few studies have evaluated the association between lifestyle and self-rated mental and physical health in a general population. The current study is aimed to assess the improvement in general health as a subjective well-being following yoga-based lifestyle intervention program.

OBJECTIVES: To assess general health status using a general health questionnaire(GHQ), which includes four domains namely somatic symptoms (SS), anxiety and insomnia (AI), social dysfunction (SD), and severe depression (SP) of the subject before and after practicing yoga.

METHODS: The study was conducted on 30 volunteers who had enrolled for undergoing an integrated yoga module. The questionnaire was given to the subjects on admission which was considered as pre test. The subjects performed Asanas, Pranayama, cyclic meditation, notional correction, devotional sessions, supervised practice sessions (by trained experts) for 1 hour daily, for a period of 1 week at SVYASA Bangalore. The same questionnaire was given after 1 week as post test. The GHQ a uses a binary method of scoring (0, 0, 1, 1) to assess four robust subscales SS, AI, SF, and SP. Lower scores in the GHQ indicate better state of the health.

RESULTS: The data analysis showed 52.17% significant decrease (P<0.001) in somatic symptoms 61.29% significant decrease (P<0.001) in anxiety and insomnia, 58.16%
significant decrease ($P<0.001$) in social dysfunction, 67.44% significant decrease ($P<0.001$) in severe depression, and 59.62% significant decrease ($P<0.001$) in all medical complaints.

**CONCLUSION:** Persons with a good subjective well being will have a high self-esteem which will influence many situations in the workplace. The results from the present study suggest that practicing yoga every day may be associated with improvement in the general health status.

**CA04PP**

**EFFECT OF SUDARSHAN KRIYA YOGA (SKY) ON PULMONARY FUNCTIONS**

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Yoga and Pranayama are well-adopted relaxation techniques used by human beings for a long time to manage various health conditions. It is well known that yoga has various physiological effects on the body. Therefore, the present study is planned to see the effects of one of the modern yogic techniques, Sudarshan Kriya Yoga (SKY), on pulmonary functions in normal subjects. There are only few studies done on this yogic method.

The present study was conducted over a period of three months on 30 healthy medical students between 18-25 yrs of age and of either sex. They were randomly selected, screened out for inclusion and exclusion criteria and written consent was also taken. PFT were performed by computerized spirometer (Spirolab 2MIR) in sitting posture as per recommendations of American Thoracic Society for Spirometry. PFT was done before, after 7, 30 and 90 days of SKY practice. Statistical analysis was done by paired ‘$t$’ test. The result revealed a significant increase in FVC ($p<0.005$), FEV1 ($p<0.03$), VC ($p<0.03$), MVV and Peak expiratory flow rate ($p<0.001$) after 90 days of SKY practice. However, no significant change was observed in all the studied pulmonary parameters after 7 and 30 days. No significant change in mid expiratory flow rate (50-75) and FEV1/FVC was seen at the end of the study. It seems that regular and prolonged practice of SKY might be more beneficial and used as an alternative way to lead a healthy lifestyle.

**CA05PP**

**EFFECT OF SHORT TERM YOGA THERAPY ON EMOTIONAL INTELLIGENT QUOTIENT AND COGNITIVE PERFORMANCE.**

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**OBJECTIVES:** To study the efficacy of short term yoga on cognition & emotional intelligent quotient in patients admitted in S-VYASA centre.

**METHODS:** In this study 30 subjects aged 18-65 years, of both sexes, and who consented to participate in the study were randomly selected. The participants practised an integrated yoga module for 7 days under supervision of trained yoga experts. Cognition & Emotional intelligent quotient (EQ) were
assessed before and after the whole session using the self-administered Digit Letter Substitution Task (DLST) for cognition & EQ questionnaire respectively. A duration of 90secs was given to the subject to perform DLST before and after the yoga therapy.

**Statistical Analysis:** Means, standard deviations, chi square test, paired t-test were used to analyze the data using SPSS-16.

**RESULTS:** Pre test and post test scores of DLST of the whole group was analysed using paired t-test and showed a significant improvement (p=0.0001). The EQ of the group as a whole improved significantly when compared using paired t-test (p=0.0001). Pearson Co-efficient test was used to further compare the EQ of 5 subgroups based on their pretest scores. Comparison between the pre & post test scores were done (co-efficient is 0.037).

**CONCLUSION:** The results suggest that participation in the yoga program was associated with improvement in cognition & EQ.

**CA06PP**

**EFFECT OF YOGA (ASANA AND PRANAYAMA) ON LIPID PROFILE.**
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**OBJECTIVES:** To observe the effect of Yoga on serum lipid profile in normal healthy volunteers in western ODISHA

**METHODS:** The study was conducted on normal healthy volunteers, to evaluate the effect of Yoga (Asana and Pranayama) on blood lipid profile. The study was conducted on 62 healthy volunteers of Yoga school in Sambalpur between the age of 20-60 yrs. Out of them 37 were men and 25 were women. The lipid profile was observed prior to initiation Yoga training and after 6 month, 1 year and 2 years of Yoga training. Statistical analysis was done by using ANOVA test.

**RESULTS:** It was found that there was a significant rise in S.HDL-cholesterol and a significant fall in S. Total Cholesterol, TGs, LDL and VLDL-Cholesterol in both male and female.

**CONCLUSION:** The results of the present study indicate that Yoga (Asana and Pranayama) can be helpful in patients with lifestyle disorders such as coronary artery disease and diabetes mellitus which are associated with abnormal lipid profile.

**CA07PP**

**EFFECT OF YOGA AND WALKING PROGRAM ON SELF RATED BODY IMAGE IN OBESE PERSONS.**
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**OBJECTIVES:** The study was conducted to compare the effects of a fifteen day residential yoga and walking program on the self rated body image in obese persons.

**METHODS:** Forty-six obese participants with ages ranging from 20 to 55 years (group mean ± S.D., 36.98±11.55) were selected for the
study based on a BMI ≥23 kg/m². The participants were randomized in two equal groups using a computer generated random table. Sixteen participants were dropped out at the end of the study. The assessment of both groups was done at the beginning and after fifteen days of intervention. Self rated body image was assessed using a standard body image questionnaire. The yoga group practiced yoga for forty-five minutes two times in a day for fifteen days. In the forty-five minutes of yoga intervention the breathing techniques were emphasized and this covered thirty-three minutes of the total time of the intervention. In the rest period of time some specific postures (asanas) were practiced. The walking group practiced forty-five minutes of yogic walking for two times in day. During this participants walked at their own pace. Each day participants were given non calorie restricted diet of approximately 1800 kcal. Data for 30 participants, fifteen for each group, recorded at the beginning and at the end of the intervention was analyzed by RM-ANOVA using SPSS Version 16.0.

RESULTS: Significant decrease in scores of body image questionnaire (p<0.01) was noticed in both groups.

CONCLUSION: Both practices yoga as well as walking with non calorie restricted diet improves self rated body image in obese persons.

CA08PP

EFFECT OF SAVITRI PRANAYAMA PRACTICE ON RESPIRATORY PARAMETERS IN HEALTHY INDIVIDUALS.


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OBJECTIVES: Savitri is the feminine form of Savitu, 'the Sun', and is hence referred to as the 'goddess of solar harmony'. Harmony in the Savitri rhythm is established using a four part breath – puraka, kumbhaka, rechaka and shunyaka. This study was planned to determine whether there is any change in respiratory parameter in the subjects practicing Savitri Pranayama and with that of subjects not practicing any kind of yoga.

METHODS: The study group consisted of 30 healthy adults who had recently started yoga practice at the Shivananda Ashram, Ahmedabad. They were motivated to undergo Savitri Pranayama training for 30 minutes daily, for 6 days a week, minimum for 12 weeks. The control group consisted of age and sex matched 30 subjects not practicing any kind of yoga. Peak Expiratory Flow Rate & Maximum Breathing Capacity were determined by using a digital spirometer. Expiratory pressure and 40 mm endurance test were determined by using a Mercury Manometer. Breath Holding Time was determined by using a stop-watch.

RESULTS: The study group showed significant increase in all the parameters measured when compared to the control group. For all the parameters a P-value of <0.005 was considered as statistically significant.

CONCLUSION: It is concluded that a practice of Savitri Pranayama has beneficial respiratory effects. This resultant effect of Pranayama can be used as a lung strengthening tool to treat many lung diseases like asthma, allergic bronchitis and many occupational diseases.
THE STUDY OF CARDIORESPIRATORY PARAMETERS IN SUDARSHAN KRIYA YOGA IN MEDICAL STUDENTS.

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OBJECTIVE: To study the effect of Sudarshan kriya Yoga on Heart rate, Blood pressure, Respiratory rate, Single breath count, Breath Holding Time and 40mm endurance test.

METHODS: This study is a cross sectional comparative study. 30 medical students of either sex of 18-25 age group who participated in Art Of Living course (in which Sudarshan kriya is taught) for 6 days are taken as subjects, with no history of medical and surgical illness and no history of smoking and alcohol intake and no history of previous exercise.

Heart rate measured by ECG. Blood pressure measured by mercury sphygmomanometer. Respiratory rate, Single breath count, Breath holding test are measured by manual methods. 40 mm endurance test done by sphygmomanometer and stop watch. All these parameters are measured on first day and last day of course.

RESULTS: There was decrease in Heart rate, Blood Pressure and Respiratory rate and increase in Single breath count, Breath holding test and 40mm endurance test at the end of 6 days course as compared to previous values.

CONCLUSION: This study suggests positive effect of Sudarshan kriya yoga on cardio respiratory parameters. Sudarshan kriya yoga strengthens cardiac and respiratory system.

IMMEDIATE EFFECT OF HIGH FREQUENCY YOGA BREATHING ON MUSCLE STRENGTH AND MOTOR SPEED.

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OBJECTIVE: The study was conducted to assess the effect of high-frequency yoga breathing on muscle strength and motor speed.

METHODS: Fifty male participants with ages ranging from 18 to 40 years (group mean ± S.D., 27.6 ± 7.3 years) participated in the study. All participants had six months experience of yoga, including the high frequency yoga breathing practice and breath awareness. They were staying in a yoga center located in north India. Bilateral handgrip strength, leg and back strength, finger tapping and arm tapping speed were assessed before and after (i) high frequency yoga breathing for 15 minutes and (ii) breath awareness. Sessions (i) and (ii) were on two different days but at the same time of the day. The schedule was alternated for different participants. High frequency yoga breathing (HFYB) at approximately 1.0 Hz involved active exhalation. Breath awareness required participants to be aware of their breath while seated, relaxed.

RESULTS: There was a significant increase in right hand grip strength after high frequency yoga breathing (p<0.05 repeated measure ANOVA, post-hoc analysis). No significant
change was observed after breath awareness. Both finger and arm tapping improved after both practices. Hence a ‘practice’ effect could not be ruled out.

**CONCLUSION:** High frequency yoga breathing appears to cause an immediate increase in hand grip strength, but not in leg and back strength, possibly related to differences in the energy producing properties of the two muscle groups.

**CA11PP**

**EFFECT OF INTEGRATED YOGA ON EMOTIONAL DIMENSIONS OF THE PARTICIPANTS IN SVYASA.**

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**OBJECTIVE:** To assess the effect of the Integrated Yoga module on emotional dimensions of the participants. Emotional intelligence (EI)/Emotional quotient (EQ) is the ability to monitor one's own and others' thinking and actions. Emotional intelligence has found to be associated with a range of outcomes which in a broad sense can be regarded as relating to quality of life.

**METHODS:** The study includes 30 subjects between 20-60 years of age who came to Prasanti Kutiram for yoga practice. In this study the EQ test developed by Prof N. K. Chadha which was standardized and validated with reliability of 0.94 and validity of 0.92 was given to all the subjects on admission to SVYASA which measure emotional dimensions of emotional competency, emotional maturity and emotional sensitivity. All the subjects of this study participated in asanas, pranayama, cyclic meditation, notional correction, devotional sessions, supervised practice sessions (by trained experts) for one hour daily.

The program was conducted in the serene and peaceful atmosphere of the Prasanti Kutiram in a residential set up with a schedule starting from 5 AM to 10 P.M. After one week of integrated yoga therapy, same questionnaire was given and this was considered as post test.

The test has 22 real life situations based on 20 point scale rating and then finally obtained scores that was converted into percentile score.

**RESULTS:** EQ analysis (n=30) showed significant increase (P<0.001) in maturity and competency (r=0.233, 0.371 respectively) and decrease in sensitivity after intervention as compared with pre intervention.

**DISCUSSION:** Significant increase in EQ in the present study suggests that participants may strike a balance between emotion and reason, are aware of their own feelings, show empathy and compassion for others, and have high self-esteem.

**CONCLUSION:** Yoga enhances the EQ of the participants which helps them balance emotion and reason.

**CA12PP**

**COMPLIMENTARY EFFECTS OF SUDARSHAN KRIYA (SDK) ON CARDIO-RESPIRATORY PARAMETERS & MENTAL WELL-BEING.**

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OBJECTIVE: To determine the effects of SDK (Ujjaiyi, Bhastrika, OM chanting, 3 cycles of deep, normal, rapid breathing & meditation) on heart rate (HR), systolic blood pressure (SBP), and peak expiratory flow rate (PEFR) & mental well-being.

METHODS: Study group included 50 subjects who performed SDK for 3 months. The control group consists of 50 subjects. None of them was performing SDK or any other physical activity on a regular basis. Resting data were obtained from all the subjects. Then, heart rate (HR) was taken for 1 min, blood pressure was then measured at the 15-min interval and PEFR was measured before & after SDK in study group while control index (1998 version) at the end of the study.

RESULTS: In study group before SDK the HR, SBP, DBP and PEFR were 83.6 ± 11.1 bpm, 127.7 ± 9.2 mmhg, 81.7 ± 8.8 mmhg, 346.8 ± 113.5 L/min respectively. While after SDK, they were 72.4 ± 11.4 bpm, 119.1 ± 8.8 mmhg, 80.0 ± 7.1 mmhg, 402.8 ± 105.2 L/min respectively. Mental well-being score was 80 ± 9 in study group while in control group it was 64±7. P value (P=0.0001) is significant in HR, SBP, PEFR & mental well-being status after SDK among study group.

CONCLUSION: This study showed that in comparison of control group, SDK significantly improves the cardio respiratory system & mental well-being in study group.

Key words: Crossword puzzle; Medical education; Learning tool; Student.

CA13PP

EFFECT OF YOGA ON CARDIOVASCULAR SYSTEM IN SUBJECTS ABOVE 30 YEARS*
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OBJECTIVE: To study & compare the cardiovascular parameters in subjects those doing yoga & not doing yoga.

METHODS: Present study was performed in 30 subjects (15 males & 15 females) doing yoga & 30 controls (15 males & 15 females) not doing yoga. All subjects in the age group of 30-60 years were included. All subjects were free from any neurological, cardiovascular & respiratory diseases. Subjects doing yoga (pranayam) daily for at least one hour since five years were selected for the study. Cardiovascular parameters like pulse rate, diastolic & systolic blood pressure were determined in 60 subjects. Pulse rate was measured by palpatory method & blood pressure was measured by Mercury sphygmomanometer.

RESULTS: Values of age, height, weight & BMI were not significantly different between cases & controls, whereas values of pulse rate, diastolic & systolic blood pressure showed statistically significant difference (P<0.01) between cases & controls.

CONCLUSION: It has been proposed that when yoga is done for long duration it affects the vasomotor center in the medulla which leads to the reduction in the sympathetic tone & thus systolic, diastolic blood pressure & pulse rate are reduced. Thus yoga can be used to reduce morbidity & mortality due to cardiovascular diseases.
CA14PP

CLASSICAL MUSIC INTERVENTION IN THE INTENSIVE CARE UNIT: A COMPLEMENTARY THERAPY TO IMPROVE PATIENT OUTCOMES.

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OBJECTIVE: The role of music in intensive care patients is still unclear. But, it is well known that music may not only improve quality of life but also effect changes in heart rate and heart rate variability. Therefore aim of the present study was to find the effect of classical music on physiological parameters and whether music can act as an adjuvant to drug treatment.

METHODS: Patients of either sex were randomized into two groups of 25 patients each. Group 1 patients received music therapy while Group 2 patients act as a control. Blood pressure, heart rate, respiratory rate, sedation and pain scales scores, medication administration were recorded before and after music intervention session. Initial data were obtained within 30 minutes prior to initiating a music intervention session and subsequently collected within 30 minutes after the completion of music session.

RESULTS: In group 1, there were statistically significant decrease in depression scales (P<0.001), blood pressure (P<0.001) and heart rate (P<0.001). There was decrease need for analgesic drugs and shorter length of stay in music group.

CONCLUSION: Music therapy plays an important adjuvant role and classical music therapy can be utilized as an effective intervention in patients with cardiovascular disturbances, pain and in intensive care medicine.

CA15PP

EFFECT OF MUSIC THERAPY AMONG HOSPITALIZED PATIENTS WITH CHRONIC LOW BACK PAIN: RANDOMIZED TRIAL.

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OBJECTIVE: To evaluate the influence of music therapy in hospitalized patients with chronic low back pain.

METHODS: A controlled, randomized study (N = 60). During a stationary rehabilitation stay of 10 days, 60 patients with low back pain were randomized to receive on alternate months standardized physical therapy plus 4 music therapy sessions between day 1 and day 3 (intervention group; N = 30) or standardized physical therapy alone (control group; N =30). Scores for pain (as measured on a visual analogue scale [VAS]), disability (Oswestry index) were collected on day 1, 3 and 10. Pain intensity was also evaluated on a VAS and measurement of GSR (Galvanic Skin resistance) by biofeedback machine (Relax701), just before and after music therapy sessions.

RESULTS: Introduced music therapy sessions during a stationary rehabilitation stay in patients with chronic low back pain reduce pain (-2.0+/−2.5 vs -1.8+/−2.6) but not
significantly. However, music therapy significantly (p < 0.01) reduced disability as measured on the Oswestry index between day 1 and day 3 (-10.8+/-15.8 vs -2.1+/-9.0). The immediate effect on pain intensity (VAS score and GSR) was confirmed (p < 0.001 and p < 0.01 respectively).

CONCLUSION: Our results confirmed the effectiveness of music therapy for hospitalized patients with chronic low back pain.

CA16PP
TO CORRELATE THE DOSHAS WITH PHYSICAL WELLBEING.

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OBJECTIVE: In traditional Ayurveda, vata is responsible for movement, physical and mental function, and degeneration, pitta is responsible for digestion, metabolism, and emotions, and kapha is responsible for lubrication, structure and synthesis. When there are imbalances between the doshas diseases can arise. The present study was conducted to correlate the doshas with physical wellbeing.

METHODS: Twelve hundred and ten volunteers with ages ranged between 15 and 75 years (group mean age ± S.D., 28.13 ± 9.75) participated in this study. Most of the participants were graduates. The data were collected from the participants who attended a 7 day residential yoga camp in the north of India. A cross-sectional single group design was used in this study. Participants were assessed for dosha dominance using Tridosha questionnaire and the somatization of stress was measured using Symptom Checklist-90-R, (SCL-90-R). Participants were taught yoga practices, which included asanas, pranayamas and meditation during the yoga camp for three hours, daily for seven days. Pearson Correlation was done to correlate dosha with SCL-90.

RESULTS: The total number of Vata dominant participants were 346, Pitta dominant participants were 385, and Kapha dominant participants were 166. Vata dominant participants showed a significant positive correlation with diseases related with muscles and respiration (P<0.05). Pitta dominant participants showed a significant positive correlation with ortho/muscular diseases, and gastrointestinal diseases (P<0.05). Kapha dominant participants showed a significant positive correlation with diseases related with muscle, ortho/muscular, respiration, and gastrointestinal systems (P<0.05).

CONCLUSION: There is a relation between which dosha is dominant and type of disease. Hence dosha diagnosis can be useful in disease prevention.

CA17PP
TO CORRELATE THE DOSHAS WITH SLEEP.

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OBJECTIVE: According to Ayurveda, three Doshas namely Vata, Pitta and Kapha are responsible for the maintenance of homeostasis in a human being. According to the Ayurvedic concept, a person with Vata prakriti has unpredictable metabolism, Pitta
has a quick metabolism and Kapha has slow metabolism. This might influence the sleep pattern of a person. Hence the present study intended to correlate the doshas with sleep quality.

**METHODS:** Eight hundred and ninety one volunteers with ages ranged between 15 and 75 years (group mean age ± S.D., 50.59 ± 14.65) participated in this study. Most of the participants were under graduates. The data were collected from the participants who attended a 7 day residential yoga camp in the north of India. A cross-sectional single group design was used in this study. They were assessed for dosha dominance using Tridosha questionnaire and the quality of self-rated sleep were measured using a Sleep Rating Questionnaire, SRQ (Telles & Manjunath, 2005). They practiced asanas, pranayamas, and meditation during the yoga camp for three hours, daily for seven days. Product moment correlation was done to correlate dosha with sleep.

**RESULTS:** The total numbers of Vata dominant participants were 211, Pitta dominant participants were 166, and Kapha dominant participants were 83. Vata dominant participants showed a significant positive correlation between time taken to fall asleep in minutes and the number of arousals (P<0.05). Kapha dominant participants showed a significant positive correlation between hours of sleep and Kapha scores (P<0.05).

**CONCLUSION:** Kapha Prakriti have better sleep in comparison to Vata and Pitta dominant persons. Vata Prakriti persons took long time to sleep and greater frequency of awaking times in the night as compared to Pitta and Kapha dominant persons.

**CA18PP**

**EFFECT OF AN INTEGRATED APPROACH OF YOGA THERAPY ON QUALITY OF LIFE IN CORONARY ARTERY DISEASE PATIENTS.**

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**OBJECTIVE:** The role of depression, anxiety, anger, and type A personalities are involved in the pathogenesis of CAD. The presence of negative emotions, such as feeling of frustration, tension, and sadness were found associated with a 2-fold greater risk of myocardial ischemia in patients with stable CAD. Since yoga practices bring relaxation of body and mind, these practices may be ideal for improving one’s ability to withstand stressful stimuli and thereby quality of life.

**Study Design:** 40 stable CAD patients below 65 years of age in both sexes were selected from the Medicine OPD, Guru Teg Bahadur Hospital. Quality of life in all the subjects was assessed by following standardized questionnaires – Seattle angina questionnaire (SAQ) and SF-36 before and after 3 months of yoga therapy. Subjects followed yoga regimen which consisted of pranayama breathing exercises and yogic postures for 1 hr duration daily under the guidance of a yoga instructor. Dietary modifications were also done. Student’s paired T Test was applied to assess each parameter before and after the yoga regimen.

**RESULTS:** The domains covered by SAQ like physical limitation, angina stability, angina frequency, treatment satisfaction, & overall quality of life and domains covered by SF-36
like physical functioning, social functioning, physical impairment, emotional impairment, emotions, vitality, pain and global health were found to be statistically improved in CAD patients after 3 months of yoga regimen.

CONCLUSIONS: Practicing yoga regularly reduces the emotional stress by reducing the sympathetic stimulation and brings a balanced state of mind. Quality of life improves in CAD patients by adopting a yoga based lifestyle.

Key words: CAD, Quality of life, SAQ, SF-36, Yoga regimen.

CA19PP

TO DETERMINE THE IMMEDIATE EFFECT OF FORCED NOSTRIL BREATHING IN MEMORY PERFORMANCE.

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OBJECTIVE: To determine the immediate effect of forced nostril breathing in memory performance.

METHODS: Study was done on fifty normal subjects of both genders, age 25±5 years. The subjects were trained for 3 types of nostril breathing; right nostril breathing, left nostril breathing, and associate learning for duration of 30 minutes daily for two week. At the end of second week the subjects were examined for immediate effect of nostril breathing before and after 30 minutes of intervention on memory performance using WECHSLER memory scale.

RESULTS: This was self-control study to determine the immediate effect of forced nostril breathing on memory performance.

Measure ANOVA analysis revealed a significant increase in Digit Span Forward, Digit Span Backward and associate learning recall performance due to forced nostril breathing at P<0.001 level.

CONCLUSION: Forced nostril breathing facilitates Digit Span Forward and Digit Span Backward and Associate Learning recall performance. Different types of nostril breathing effects on hemispheric function & helps to restore the memory function. This study concludes that the different types of forced nostril breathing enhance numerical data retrieval mostly as a result of left brain activation.

CA20PP

EFFECT OF YOGA REGIMEN ON LUNG FUNCTIONS INCLUDING DIFFUSING CAPACITY IN CORONARY ARTERY DISEASE PATIENTS

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OBJECTIVE: Coronary artery disease (CAD) is the most common form of heart disease which gets precipitated by increasing stress, dietary habits and urban sedentary lifestyle. Pulmonary functions are found to be influenced in congestive heart failure, left ventricular dysfunction and after cardiac surgery. Diffusion capacity (DLCO) progressively worsens as CHF severity increases due to reduction in lung tissue participating to gas exchange. Pranayama breathing exercises & yogic postures play an impressive role in strengthening of respiratory muscles which improve cardio-
respiratory efficiency. As very few studies are available on the effect of yoga practices on CAD patients and none on lung diffusion capacity, this study was done to see the effect of 3 months of yoga regimen on lung functions of CAD patients.

METHODS: 80 stable CAD patients below 65 years of age in both sexes were selected from the Medicine OPD, Guru Teg Bahadur Hospital. These patients were randomized into two groups of 40 each: group-I consist of CAD patients on yoga therapy along with conventional medicine and group II comprise of CAD patients only on conventional medicine. PFT's including DLCO were recorded thrice: 0 day, 22nd day and on 90th days using computerized MS medisoft Cardio-respiratory Instrument, HYP'AIR Compact. The recorded parameters were statistically analyzed by repeated measures ANOVA followed by Tukey’s test.

RESULTS: Statistically significant improvements were seen in SVC, FVC, PEFR, MVV and TLCO after 3 months of yoga regimen in group I. FEV1, and FEV1% also showed a trend towards improvement although not statistically significant.

CONCLUSION: Pranayama breathing exercises and yogic exercises were found to improve lung functions and DLCO in CAD patients and can be used as a complimentary therapy for their rehabilitation.

Keywords: CAD, PFTs, Pranayama breathing exercises, Yoga regimen.

CV01PP

CARDIORESPIRATORY REFLEXES EVOKE BY INTRA-ARTERIAL INJECTION OF MESOBUTHUS TAMULUS VENOM INVOLVE PERIVASCULAR RECEPTORS.

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OBJECTIVE: Autonomic changes and cardiorespiratory alterations seen in vascular disorders are suggested to be mediated by the activation of sensors around the peripheral blood vessels. But, the role of sensory receptors and afferents from the peripheral blood vessels is still not clear. Present study was conducted to examine the role of stimulation of perivascular nociceptors and the afferents involved in it.

METHODS: All the experiments were performed after obtaining the approval from the Institute Ethical Committee. Healthy male albino rats were anaesthetised with an intra-peritoneal injection of urethane. Tracheostomy was performed to keep the airway patent. Femoral artery was cannulated proximally as well as distally to record the blood pressure and to inject the chemicals, respectively.

RESULTS: Intra-arterial injection of venom produced, immediate hyperventilatory response followed by hypoventilatory response and finally a sustained hyperventilatory response up to 60 min. The hypertensive response began after 40 s, peaking at 5 min and remained above the initial level subsequently. The bradycardiac response began around 5 min, peaking at 25 min and remained at that level. The venom-induced responses were markedly attenuated after pretreatment with capsazepine (P<0.05, two-way ANOVA). The ipsilateral neurotomy partially attenuated the BP and respiratory responses but not the HR (P<0.05, two-way ANOVA).
ANOVA). However, the lignocaine pretreatment also produced the same response as with the neurotomy.

**CONCLUSION**: The data provide evidences for the involvement of VR 1 and the afferents running mainly through the ipsilateral somatic nerve in mediating the vasosensory responses. In addition, HR changes appear to involve separate pathway.

**CV02PP**

**A PILOT STUDY TO EVALUATE THE ASSOCIATION BETWEEN AGE AND PERIPHERAL SYMPATHETIC NEURAL FUNCTION USING WATER IMMERSION SKIN WRINKLING (WISW) TEST IN HEALTHY SUBJECTS.**

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**OBJECTIVE**: Cardiac autonomic tests help to detect ANS dysfunction. Sudomotor function involves thermoregulation of sweat glands through sympathetic sudomotor and vasomotor fibres. Different aspects of sudomotor function, such as the electrical activity can be measured and quantified by sympathetic skin response (SSR). Finger wrinkling test is simple and easy test to assess the sympathetic nervous function. i) To study the association between age and peripheral sympathetic neural function using finger wrinkling test ii) To compare the standard cardiac sympathetic tests with WISW test across age range.

**METHODS** - Twenty two healthy volunteers between the age group of 18 to 50 were recruited. Following anthropometry all subjects underwent standard sympathetic tests including head up tilt, sustained isometric contraction and cold pressor test. Water immersion skin wrinkling (WISW) test was done for 30 minutes and water temperature maintained at 40°C. The number of wrinkles were counted by two independent observers at baseline, 5th, 15th and 30th minute after immersion. Scores at each point of time was averaged to obtain a cumulative score.

**RESULTS** - The mean age of subjects was 30.2±9.44. There was a negative association between WISW and age (r= -0.54 p=0.01). There was a strong association (r=0.51 p=0.05) between the change in the diastolic blood pressure immediately after the HUT from baseline and WISW scores.

**CONCLUSION**: Peripheral sympathetic function decreases with increase in age as indicated by WISW. This test could potentially become a simple noninvasive test to evaluate sudomotor function in clinical set up.

**CV04PP**

**ASSESSMENT OF CARDIOVASCULAR RISK FACTORS IN MIDDLE AGED SUBJECTS.**

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**OBJECTIVES**: Cardiovascular disease (CVD) is predicted to be the most common cause of morbidity and mortality globally by 2020.

So we assessed-

1) Various forms of risk factors associated with cardiovascular disease.
2) To score them according to their major impact on cardiovascular system.

3) To interpret the scores obtained as a measure of cardiovascular disease risk categories.

**METHODS:** 50 subjects in the age group of 35-64 years attending medicine OPD, in tertiary care hospital, Mumbai were selected on the basis of inclusion and exclusion criteria from both the sex. Fasting plasma glucose, lipid estimation, blood pressure and anthropometric measurement were done in all subjects. Subjects were given a questionnaire adapted from Journal of American Medical Association and scores were obtained.

**RESULTS:** Various forms of attributable risk factors for cardiovascular disease were obtained and interpreted as follows.

a) Diabetes 50%,

b) Hypertension 72%,

c) Dyslipidemia 32.6%,

d) Overweight (BMI>30kg/m²) 38%,

e) Use of tobacco in any form 40%,

f) 70% subjects followed a sedentary lifestyle,

g) 24% subjects having family history of death due to cardiovascular disease.

Subjects were categorized as low, medium and high risk for cardiovascular disease depending on sum of all risk factors.

**CONCLUSION:** The prevalence of common cardiovascular risk factors in this study population seems to be high. Although the overall treatment and control of diabetes and hypertension was better in this population, it was still inadequate and this emphasizes the need for greater awareness about non-communicable diseases.

**CV05PP**

**AUTONOMIC FUNCTIONS IN PRIMARY DYSMENORRHEA.**

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**OBJECTIVE:** The aim of the present study was to evaluate the autonomic status and pain profile in healthy young females with primary dysmenorrhea (PD).

**METHODS:** Thirty healthy unmarried female volunteers between the age group of 18-25 years, having regular 28-32 days menstrual cycle for at least last 6 months, were recruited. Those with history of secondary dysmenorrhea, smoking, alcoholism, diabetes, hypertension, thyroid disorders, cardiovascular diseases, practicing any relaxation technique and taking oral contraceptive pills or any other drugs that alter the cardiovascular functions were excluded from the study. The menstrual distress questionnaire was used to assess the symptoms. Intensity of pain was assessed by visual analogue scale. Subjects were divided into two groups- Group A consisted of 15 females suffering from PD and Group B (control) – Age matched, 15 eumenorrheic females with few premenstrual symptoms. Autonomic function tests (AFT) - Heart rate response to standing: (30 : 15 Ratio), Heart rate variation
with deep breathing (deep breathing difference) and Sympathetic Galvanic Skin Resistance were carried out using POLYRITE AD during all 3 phases (menstrual, follicular and luteal) of menstrual cycle in both study and control groups.

**RESULTS:** Statistical analysis showed increased sympathetic and decreased parasympathetic activity in dysmenorrheic subjects in all the examined phases. However, in eumenorrheic women, same was observed in luteal phase only.

**CONCLUSION:** Although the underlying pathophysiological mechanisms of primary dysmenorrhea remain unclear, the present study suggests that altered functioning of the autonomic nervous system could be associated with pain and diverse psychosomatic symptoms in dysmenorrheal subjects.

**CV06PP**

**STUDY OF THE GENDER VARIATION OF CARDIOVASCULAR REACTIVITY IN RESPONSE TO DICHOTIC LISTENING TASK AND COLD PRESSURE TEST IN RIGHT HANDED UNDERGRADUATE MEDICAL STUDENTS.**

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**OBJECTIVE:** Sex differences in cardiovascular reactivity & functional cerebral activation pattern may contribute to the differing incidence of Coronary Heart disease in men & women. Further, decreased functional laterality for speech among women yields differences in the impact of speech processing may differentially impact emotional processing system as evidenced here in Blood Pressure indices. So the object of the present study is to reveal the effect of phonemic dichotic listening task and Cold Pressor Test on cardiovascular reactivity in Gender differences, if any.

**METHODS:** Only right-handed participants (50 boys and 50 girls) first year MBBS Students of S.N. Medical College, Agra were participated in the study to ensure max. homogeneity within the experiment. Informed written consent were taken before the study. **Exclusion criteria:** Students suffering from History of Head Injury, Neurological Damage, Serious illnesses, Raynaud's Syndrome, Extreme sensitivity to cold temp. Asthma, Arthritis or Psoriasis were not included in the study. **Variables:** Independent variables were sex and focus group (NO, FL, FR). The dependent variables were the physiological measures (SBP, DBP, HR), the dichotic listening scores from the left ear, right ear, POC Scores, stress & pain Scores obtained from self report. 100 Right handed (N=50) Boys and (N=50) girls underwent physiological measurements of SBP, DBP & HR before and after exposure to phonemic dichotic listening task and Cold Pressure Test.

**RESULTS & CONCLUSIONS:** Boys & Girls both evidenced increased cardiovascular reactivity with boys experiencing significantly more cardiovascular reactivity (Systolic Blood Pressure) than girls in response to cold pressure pain. Girls were also able to identify significantly more speech sounds (Phonemic Dichotic Listening Task) presented to the left ear (FL) than boy, and they were able to dynamically increased accuracy at the targeted ear identified with each focus group. (FL or FR). Speech sound processing (Dichotic
listening task) reflecting functional cerebral laterality significantly decreased in boys, but not in girls. Systolic Blood Pressure. The Dichotic listening accuracy scores were also compared to cardiovascular measures. Sex differences were analyzed with an emphasis on asymmetric pattern in dichotic listening scores and cardiovascular measures (SBP, DBP, HR). Boys showed more difficulty with language processing during pain a stressful situation, as they are more laterally specialized while girls showed less difficulty with language processing, as they seem to have bilateral access (to both emotion and language). There is evidence that girls have better connectivity between the two cerebral hemisphere, via a more dense corpus callosum (in females). These sex differences were also assessed according to focus group. Boys and girls were asked to focus on speech sounds in the their left ear (FL), right ear (FR) or no ear (NO) in particular. This design allowed for analysis not only sex & stress condition, but, by focus too.

CV07PP

CORRELATION OF ALTERED LIPID PROFILE TO CHRONOLOGY OF DERANGEMENT OF VASCULAR BIOMARKERS

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OBJECTIVE: To study correlation of altered lipid profile to chronology of derangement of vascular biomarkers.

METHODS: This was a case-control study comprising of 30 overweight/obese healthy subjects (BMI > 25 kg/m^2 and/or WHR (female>0.85; male>1) and 30 non-obese healthy subjects (BMI< 25 kg/m^2 and/or WHR (female<0.85; male<1) excluding subjects with secondary cause of abnormal blood flow. Reactive hyperaemia (RH) was measured by impedance plethysmography (NICOMON, L&T) in the subject’s forearm along with fasting plasma glucose, S. Lipids and S.Endothelin-1.

RESULTS: Plasma glucose, RH, lipid profile & S.Endothelin were comparable in both the groups. So the groups were clubbed to seek further association. Of the two contrasting biomarkers Endothelin-1 & Nitric oxide (indirectly evaluated by RH response), only RH was significantly altered (raised) in subjects with deranged S. VLDL (p=0.026) and S. Triglyceride (p=0.044).

CONCLUSION: Altered lipid profile affects the release of vascular biomarker; nitric oxide (indirectly measured via reactive hyperaemic response) much before any change in Serum Endothelin-1 levels could be seen.

CV08PP

CARDIOVASCULAR RESPONSE TO EXERCISE IN OBESE ADOLESCENTS

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OBJECTIVES:
1. To record the cardiovascular parameters in response to exercise in obese adolescents.
2. To compare the performance of obese subjects with controls.
METHODS: 25 controls (BMI < 30 kg/m²) and 20 obese (BMI > 30 kg/m²) medical students were recruited for the study. Their basal heart rate, blood pressure, ECG and SPO₂ were recorded. The participants were then asked to peddle on a bicycle ergometer at moderate load. The aforementioned parameters were recorded immediately, at 2, 5 and 20 minutes after cessation of exercise. Statistical analysis of the data was performed using unpaired t-test.

RESULTS: The results revealed a significant difference in the basal heart rate and blood pressure among the two groups. The post exercise values were also higher in the obese group. However, the pattern of response in the two groups showed a similar trend except for significantly higher values in the obese group.

CONCLUSION: Our study findings reveal that the control mechanisms of obese subjects operate at a higher range of heart rate and blood pressure, probably due to resetting mechanisms. Hence, an exercise test, can be used as an inexpensive and effective screening tool to detect early impairment of cardiovascular function and initiate appropriate preventive strategies to reduce future morbidity and mortality.

CV09PP

STUDY OF CARDIOVASCULAR AUTONOMIC FUNCTION IN RELATION TO THE DURATION OF MENOPAUSE AND VEGETARIAN DIET.

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OBJECTIVES: This study was designed to test hypothesis that long term vegetarian diet might alter or modulate cardiovascular autonomic function of healthy menopausal women in relation to lipid metabolism.

METHODS: According to menopausal duration in years, 60 women without any systemic disease or hormone replacement therapy (HRT) had been divided into 2 groups- 30 vegetarian for 3 years and 30 non-vegetarian. Parameters recorded were BMI, Pulse Rate, B.P, Waist/Hip Ratio, Lipid Profile, Heart Rate Variation, Orthostatic Tolerance Test etc.

RESULTS: Lipid profile showed significant increase in values of total cholesterol and LDL. No considerable changes were seen in triglyceride and HDL values with duration of increasing age of menopause; especially in non-vegetarian women.

CONCLUSION: Long term vegetarian diet may facilitate vagal regulation of the heart. It is inversely related to LDL, cholesterol level and blood pressure in comparison to non-vegetarian diet. Multifactorial causes like dyslipidemia, increased body fat percentage, ageing and lack of oestrogen are probably the causes of altered cardiac autonomic functions.

CV10PP

EFFECT OF MORINGA OLEIFERA LEAF EXTRACT ON ISOPROTERENOL INDUCED MYOCARDIAL INFARCTION IN RABBITS

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OBJECTIVE: To study the effect of *Moringa oleifera* alcoholic leaf extract on isoproterenol induced myocardial infarction in rabbits.

METHODS: Alcoholic extract of *M. oleifera* (Family – Moringaceae, also known as Drumstick tree or Sahinjan) leaf was prepared using Soxhlet apparatus and absolute ethyl alcohol as a solvent. Albino rabbits (2.0–2.5 kg) of either sex were divided into 3 groups of 6 each. Group I – served as control, Group II – received isoproterenol (3 mg/kg i.p.), Group III – received *M. oleifera* alcoholic leaf extract (200 mg/kg, po) for 30 days + isoproterenol (3 mg/kg i.p.). Blood samples were taken from marginal ear vein initially and after 30 days. Extent of myocardial damage was assessed electrophysiologically (ECG lead II), biochemically (AST, Troponin I, CPK-MB) and histopathologically.

RESULTS: Isoproterenol administration resulted in myocardial infarction, characterized by ST segment changes, elevation of serum cardiac biomarkers such as AST, Troponin-I and CPK-MB and histopathological changes in rabbit heart (necrosis, fatty changes, haemorrhage). Pretreatment with *Moringa oleifera* alcoholic leaf extract prevented the ST segment changes and reduced serum biomarker values. Histology of *M. oleifera* pretreated rabbit heart showed less cardiac lesions.

CONCLUSION: *Moringa oleifera* alcoholic leaf extract reverses isoproterenol induced myocardial damage in rabbits.

CV11PP

A STUDY OF CARDIOVASCULAR AND ADRENOCORTICAL STRESS REACTIVITY IN CHILDREN OF HYPERTENSIVES.

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Background: Stress plays an important role in daily life and it leads to various physiological and pathological reactions through activation of the Limbic-Hypothalamo-Pituitary-Adrenal axis and secretion of cortisol which modulates vascular reactivity. Hypertension is known to be one of the commonest reactions to stress, with increased cardiovascular morbidity and mortality. The disease process starts much earlier than it is manifested clinically. Hence it is necessary to find out persons at risk for hypertension as early as possible and to introduce lifestyle modifications and regular follow up in them.

OBJECTIVES: This study evaluated the cardiovascular reactivity and adrenocortical reactivity in children aged 14 to 18 years of hypertensive parents (Study group, n=30) in comparison to age, sex and BMI matched children of normotensive parents (Control group, n=30) to various stress tests.

METHODS: Cardiovascular reactivity in terms of change in heart rate and blood pressure from the baseline and Adrenocortical reactivity in terms of change in serum cortisol level from the baseline were measured after performing three stress tests namely mental arithmetic test, isometric handgrip test and cold pressor test.

RESULTS: The mean ± S.D. for change in serum cortisol in the study group (86.5 ± 23.99) was significantly higher (p< 0.05) than that in the control group (69.62 ± 30.92),
whereas, the mean ± S.D. for the change in heart rate and blood pressure was not found to be significant between the two groups.

**CONCLUSION:** Our study showed that there is an increase in adrenocortical reactivity to stress in subjects with family history of hypertension thus warranting early lifestyle modifications and further follow up for monitoring their blood pressure status and hypertension propensity.

**Key words:** Children of hypertensive parents, cardiovascular reactivity, adrenocortical reactivity, heart rate, blood pressure, Serum Cortisol.

**CV12PP**

**VARIATIONS IN QT INTERVAL IN ADULT SMOKERS WITHOUT CLINICALLY RECOGNISED HEART DISEASE.**

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**AIMS:** To determine association between QT interval and smoking in smokers without clinically recognised heart disease.

**OBJECTIVE:** Cigarette smoking is associated with prolonged QTc (heart rate corrected QT interval) which is related to occurrence of ventricular arrhythmia and sudden death.

This study determines effect of smoking on QTc and compare the effect of smoking in different grades of smokers.

**METHODS:** 30 smokers and 30 non-smokers were selected according to inclusion/exclusion criteria. Smokers were graded as mild, moderate, heavy according to smoking index.

12 lead ECG were recorded and QT and RR intervals obtained. QTc interval calculated using Bazett’s formula QTc = QT/√RR

**RESULTS:** The results were analysed using Mann Whitney’s Test.

Cases and controls were age matched.

QTc is prolonged in smokers as compared to non-smokers P value < 0.001 which statistically significant (Mean ± SD = 0.56 ±0.07, 0.45 ± 0.04 respectively )

QTc is maximally prolonged in heavy smokers and when compared with mild and moderate smokers difference was statistically significant. (P < 0.001 )

**CONCLUSION:** QTc is prolonged in smokers than non-smokers. It is maximally prolonged in heavy smokers. This could be because of increased sympathetic activity.

**CV13PP**

**EFFECT OF AEROBIC EXERCISE TRAINING (TREADMILL) ON HEART RATE VARIABILITY AND BLOOD PRESSURE IN THE OFFSPRINGS OF HYPERTENSIVE PARENTS**

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**BACKGROUND:** It is accepted that genetics and the environmental factors plays an important role in the genesis of hypertension. Parental history of hypertension increases the risk of developing hypertension at younger age. Aerobic exercise works in increasing the mechanical efficiency of the heart by
increasing cardiac output, which is proportionate to increase in oxygen consumption. Heart rate variability is a non invasive tool to estimate the cardiac autonomic activity.

**OBJECTIVES:** The present study was planned to assess the effect of aerobic exercise (Treadmill) on autonomic tone in the offsprings of hypertensive individuals.

**METHODS:** Sixty subjects of age group 15-25 years were divided into two groups - control group (n=30; offsprings of normal individuals) and study group (n=30; offsprings of hypertensive individuals). In both the groups heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP) and HRV parameters (time domain and frequency domain) were recorded at basal level. The study group was subjected to undergo aerobic exercise training (Treadmill) for four successive days a week for two months according to the modified bruce protocol. The entire duration of aerobic exercise was of seven minutes per day.

**RESULT:** After exercise training, we observed a significant reduction in HR (beats per min), SBP (mmHg), DBP (mmHg) and LF (%) where as a highly significant increase in HF (%) and SDNN (ms) in the study group in comparison with their basal parameters.

**CONCLUSION:** Our result suggests that even a short duration of regular aerobic exercise training (Treadmill) even for four days a week for two months can improve vagal tone.

**Key words:** Hypertension, Aerobic exercise, HRV.

**CARDIOVASCULAR EFFECTS OF TERMINALIA ARJUNA ALCOHOLIC BARK EXTRACT IN RABBITS.**

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**OBJECTIVES:** To evaluate effect of *Terminalia Arjuna* (T. arjuna) bark extract (alcoholic) on BP, ECG, lipid profile, serum cardiac markers and histopathology in normal and after 24 hours of isoproterenol administration in rabbits.

**METHODS:** In urethane anesthetized rabbits (1-1.5kg), BP was recorded by polyrite with the help of stethoms stain gauge pressure transducer connected to femoral artery. BP, ECG, lipid profile and serum cardiac markers were recorded in normal (initial, control) and after 24 hours of isoproterenol administration. Effect of T. arjuna extract (200 mg/kg, po) was recorded on these parameters in normal and isoproterenol treated rabbits (acute and chronic). At the end of study hearts were taken for histopathology.

**RESULTS:** Isoproterenol administration resulted in increased BP and hypercholesterolemia in rabbits. T.arjuna extract produced hypotension and hypolipidemic effects in isoproterenol treated rabbits. Administration of T. arjuna bark extract reversed the ECG changes induced by isoproterenol. T. arjuna bark extracts decreases level of serum cardiac markers. Histopathology of heart showed less lesions after treatment with T. arjuna bark extract.
CONCLUSION: T. arjuna bark extract reverses isoproterenol induced cardiac abnormalities in rabbits.

CV15PP

COMPARATIVE STUDY OF BASAL HEART RATE VARIABILITY (HRV) AND HRV DURING VALSALVA MANOEUVRE IN GENERALISED ANXIETY DISORDER PATIENTS.

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OBJECTIVE: Comparative study of Basal Heart Rate Variability (HRV) and HRV during Valsalva Manoeuvre in Generalised Anxiety Disorder Patients.

METHODS: The study was conducted on 60 male subjects of the age group of 18-45 years. The subjects were divided into two groups of 30 each (Group I- Controls & Group II- GAD patients) to compare the basal heart rate variability and heart rate variability during valsalva manoeuvre. The controls were selected from our staff members, medical students and healthy attendants accompanying the patients to the institute. Changes in heart rate variability were studied through time domain and frequency domain analysis.

RESULTS: During basal HRV analysis, the low value of time domain parameters indicate decreased HRV in male GAD patients as compared to male controls. Less value of both low & high frequency variables and high LF/HF ratio in male GAD patients as compared to male controls, during basal recording is suggestive of relatively more reduction in parasympathetic tone in GAD patients. While the time domain parameters does not show any significant difference among male GAD patients as compared to male controls but frequency domain parameters show the same result as that of basal HRV analysis.

CONCLUSION:
- Basal HRV analysis alone can predict the changes in autonomic activity in GAD patients.
- Frequency domain parameters are more reliable than time domain ones.

CV16PP

COMPARISON OF PAIN PERCEPTION IN YOUNG ADULT MALES WITH NORMAL AND INCREASED BMI.

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OBJECTIVES: The study aims at investigating the presence of any correlation between body mass index (BMI) and pain perception in healthy young adult males.
1. To record and compare BMI and pain threshold, tolerance and intensity in volunteers with normal and increased BMI
2. To determine correlation, if any, between BMI and perceived pain in the above groups

METHODS: Experimental pain responses in 76 male subjects aged between 18-25 years were determined in two groups, classified based on BMI. The pain perception was assessed by the cold pressor test; threshold and tolerance time were recorded and pain intensity was rated on a numeric pain scale.
Statistical significant difference between the measured parameters and the correlation coefficient were determined.

**RESULTS:** The pain threshold and tolerance time were significantly lower (p<0.05) in the group with increased BMI as compared to that with normal BMI. Pain intensity was higher in the increased BMI group. Result suggests a strong negative correlation between threshold and tolerance with BMI while pain intensity was inconclusive.

**CONCLUSION:** Pain responses vary with body mass index. Effect of BMI should be considered while interpreting pain perception. Reduction in BMI may be one method for alleviating pain.

**CV17PP**

**PHYSICAL ACTIVITY AND HRV IN YOUNG ADULTS**

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**OBJECTIVES:** It has been shown that heart rate variability (HRV) is affected by different levels of physical activity. This study is aimed to evaluate the relation between the levels of physical activity and HRV in young adults.

**METHODS:** 29 healthy adult males aged 18-25 were recruited for the study. They were grouped into low and moderate level activity group by assessing their physical activity level using Global Physical Activity Questionnaire (GPAQ). Low level group n=11, age=20.7±3, BMI=22.73±2.9 and moderate level n=18, age=19±1.09, BMI=21.67±2.4. Data obtained from resting 5 minute ECG were used for measuring frequency domain HRV parameters like LF, HF & LF/HF using software (Lab Chart 6 Pro, ADI Australia). HRV in both the groups were compared. p < 0.05 was considered significant.

**RESULTS:** In the low activity group LFnu was 46.85±13.59, HFnu 43.99±13.7 & LF/HF 1.25±0.7 and in moderate activity group LFnu 40.4±13.5, HFnu 47.13±13.7 & LF/HF 1.02±0.7 respectively. The mean heart rate in low & moderate group was found to be 76 /min and 73/min respectively. The difference in levels of physical activity was significant in both the groups (p=0.0001). Though there was no significant difference in the LFnu (p = 0.24) & HFnu (p = 0.5) in both the groups, there was an increasing trend in HFnu value in moderate activity group indicating parasympathetic activity.

**CONCLUSION:** HRV was not affected by low and moderate levels of physical activity in this study.

**CV18PP**

**COMPARATIVE STUDIES ON CARDIOVASCULAR PARAMETERS IN YOUNG OBESE AND NORMAL FEMALES OF MEDIUM SOCIO-ECONOMIC GROUP**

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**OBJECTIVE:** To study and compare the effects of obesity on cardiovascular parameters in normal young females belonging to medium socio-economic class.
METHODS: The study was undertaken at the Department of Physiology, MLN Medical College, Allahabad. The study (obese) group with BMI > 30 kg/m² and control group with BMI in the range of 18.5-25 kg/m² of 60 adult healthy females belonging to medium socio-economic class as per Prasad’s classification in each group with the age of 18-25 years were included in the study. The following cardiovascular parameters (heart rate, blood pressure) were recorded of each subject of both the groups.

Further ECG recording was performed on each subject of study (obese) and non-obese control group by using Vega-3-channel ECG machine and their PR and QTc intervals were recorded. All data obtained was analysed by using MS Excel software and p<0.05 was considered as level of significance.

RESULTS: The result of the present study showed that the systolic blood pressure of the study (obese) group was significantly higher (p<0.001) than the non-obese control group while the diastolic pressure have no significant difference in both the groups.

The heart rate have no significant difference in obese and non obese groups (p>0.05). The ECG findings shows that PR and QTc interval of the study group was significantly longer (p<0.001) as compared to the control group.

CONCLUSION: The result of the study suggests that the cardiovascular function of the young obese female seems to be compromised as compared to the comparable non-obese females belonging to the same socio-economic class.

It may be concluded that young obese females are more prone to have the risk of cardiovascular disorders.

CV19PP

NERVE CONDUCTION STUDY AND HEART RATE VARIABILITY IN OBESE PERSONS

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OBJECTIVES: To study the nerve conduction (NCS) and heart rate variability (HRV) in adult obese persons.

METHODS: The study was conducted on 30 adult obese persons (BMI>30, kg/m²) and 29 healthy normal weight persons (BMI, 18-24, kg/m²). In all subjects, short-term HRV and nerve conduction were assessed using standard protocol. The data obtained were analysed between the groups using Mann Whitney U test and presented as median (inter-quartile range)

RESULTS: In comparison to normal weight persons, obese had lower compound muscle action potential (CMAP) amplitudes of right median [9.09 (7.62-10.20) Vs 10.75 (8.71-12.2), mV, p=0.025], and right [8.5 (7.04-11.18) Vs 12.1(10.55-15), mV, p=0.000] and left tibial [9.08(6.58-11.65) Vs 13.05(10.2-15.6), mV, p=0.002] nerves. Whereas, obese persons had prolonged CMAP durations of right [10.5(9.62-12) Vs 10(8.4-10.3), mV, p=0.02] and left median [10.85(10-11.88) Vs 10(9-10.57), mV, p=0.019] nerves, and right tibial [10(9-11) 8.5(7.92-10), mV, p=0.032] nerve. Sensory NCS showed similar results. Among HRV variables, SDNN [35.55(26.77-49.25) Vs 46.15(37.22-58.57) ms, p=0.038], RMSSD
[28.75(16.72-38.35) Vs 41.55(30.6-56.75), ms, p=0.018], NN50 count [15.5(2-39) Vs 83.5(32.75-116.25), p=0.010], pNN50, HF power and SD1, which reflect cardiac parasympathetic activities were significantly lower whereas, sympathetic marker LF/HF [1.2(0.65-2.20) Vs 0.79(0.5-1.02), p=0.045] was higher in obese persons than in the normal weight persons.

**CONCLUSION:** Obesity affected autonomic modulation with an increase in sympathetic tone coupled with a reduction in vagal tone, indicating poor cardiac rhythm control. However, nerve conduction study showed a tendency of poorer amplitudes and lengthened CMAP and SNAP durations.

**CV20PP**

**CLUSTERING OF CARDIOVASCULAR RISK FACTORS IN YOUNG ADULTS ASSOCIATED WITH NUTRITIONAL STATUS.**

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**OBJECTIVES:** The major cardiovascular diseases affecting the developing world have at their core atherosclerosis and hypertension, both of which are profoundly affected by diet and can be approached, at least in part, from a nutritional point of view. Establishing early evidence of risk factors present in youth preventive measures can be initiated.

**METHODS:** A cross-sectional study was conducted in Department of Physiology, KIMS, Bhubaneswar from June to October 2012. 223 medical students (149 females, 74 males) with mean age 18.53±0.96 years, mean height 1.62±0.09 m, mean weight 60.1±13.9 kgs consented for participating in the study. Waist circumference (WC) and hip circumference were documented along with a questionnaire based on their physical activity, dietary habits such as high caloric food. Baseline blood pressure (BP) in sitting position was recorded thrice after ensuring five minutes of rest and the third reading was considered. Body Mass Index (BMI) and Waist Hip Ratio (WHR) were calculated. Statistical analysis was done using SPSS 16 software.

**RESULTS:** Statistically significant correlation (p<0.001) was seen between increased BMI, WHR, WC and diastolic BP. The subjects detected as pre-hypertensives (BP>120/80 mm Hg) had family history of cardiovascular disease, had predilection for salty, fried/oily and/or sweet food. They rarely took a walk, exercised irregularly and had BMI >25kg/m². Over 69% subjects had high WHR as per WHO standards for Asians.

**CONCLUSION:** Central obesity or truncal obesity is associated with sedentary life and high intake of calories leading to hypertension. Early detection, awareness and prevention would help reduce morbidity and mortality associated with cardiovascular diseases.  
**Keywords:** Pre-hypertensives, obesity, high calorie intake, sedentary life.

**CV21PP**

**COMPARATIVE STUDY OF CARDIOVASCULAR CHANGES AFTER STAIRCASE ASCENT AND DESCENT.**

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OBJECTIVE: To compare cardiovascular changes and recovery time after staircase ascent and descent in males and females.

METHODS: The study was conducted on 128 college students of age group 18-22 years (64 males & 64 females) from a well known tertiary hospital in Mumbai. Systolic and diastolic blood pressure and pulse rate were measured before and after ascent and descent of 150 stairs each of ht-7 inches, width-11 inches. Recovery times for parameters were recorded after ascent and descent.

RESULTS: The statistical analysis was done using SPSS version17 software and Student's t-test was applied. Mean changes in systolic blood pressure and pulse rate were significantly more (p<0.05) after ascent as compared to descent in both groups. Mean Diastolic blood pressure changes were not significant after ascent and descent. Mean recovery time for blood pressure and pulse rate was significantly more (p<0.05) after ascent as compared to descent in both groups, gender difference not significant. After ascent and descent, significant rise in Mean systolic blood pressure was found more in males as compared to females but a non significant rise in mean pulse rate was found in females compared to males.

CONCLUSION: Staircase ascent and descent both have significant changes on the cardiovascular system. As staircase descent is less stressful to the cardiovascular system compared to ascent, the former can be used as an activity that may be beneficial for individuals in the population who were previously sedentary and can be applied at the beginning stages of an exercise training program.

CV22PP

COMPARATIVE STUDY OF PHYSICAL FITNESS OF BOYS AND GIRLS FROM NORTH INDIA

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OBJECTIVES: There are a number of tests to measure physical fitness of an individual out of which Maximum Oxygen Intake test is considered to be the best method for measuring the cardio- respiratory response to exercise. Pulse rate correlates significantly with oxygen consumption during exercise making it easy to evaluate the oxygen need. The present study was planned to assess and compare the level of physical fitness among boys and girls (age group 17-20 years) of north India, studying in 1st professional of Subharti Medical College, Meerut, by using Harvard step test.

METHODS: Harvard Step test were used to assess fitness index. Index of fitness was calculated by Harvard Step test by using the formula:

Index of fitness = (Time of stepping in seconds x 100 )/( 5.5 x Pulse count)

Pulse count is the post exercise pulse count from 60 to 90 seconds after exercise by Harvard step test.

Index of fitness below 50 is poor, between 50 and 80 is average, and above 80 is good.
In this study, 30 M.B.B.S. students (age group 17-20 years, 17 male, & 13 female) participated. The collected data were subjected to statistical analysis using Graphpad Instat programme.

**RESULTS:** Obtained results are post exercise Pulse count (60-90 seconds) and calculated index of fitness among boys and girls of North India studying in M.B.B.S. 1st prof. in Subharti Medical College, Meerut. Pulse count (60-90) seconds post exercise boys (n = 17): 67.529±4.199 and girls (n = 13): 61.923±2.905 (P>0.10). Index of fitness boys (51.817±3.563) girls 54.340±2.866 (P>0.10). Values are expressed as Mean ± SEM.

**CONCLUSION:** It was concluded by results that there were no statistical significant changes in Index of Fitness among boys and girls (age group 17-20 years) of north India, studying in 1st professional of Subharti Medical College, Meerut, when calculated by using Harvard step test.

**Key words:** Index of fitness, pulse count, and Harvard step test.

**CV23PP**

**A STUDY OF BLOOD PRESSURE RESPONSE TO EXERCISE IN OVERWEIGHT AND NORMAL YOUNG ADULTS**

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**OBJECTIVE:** The aim of this study was to compare the blood pressure response to exercise in overweight and normal young adults.

**METHODS:** The study was conducted on 50, medical students in the age group of 18-21yrs at the department of Physiology, Assam Medical college. Subjects were divided into two groups, normal weight (n=25) and overweight (n=25) depending on their Body Mass Index. Blood pressure was recorded by using the sphygmomanometer in sitting position at resting state and after exercise.

**RESULTS:** This study showed that resting blood pressure were significantly higher (p<0.05) in overweight (SBP=126.42 mmHg ±8.41 & DBP=85.14 mmHg ±6.31) as compared to normal weight (SBP=115.2 mmHg ±7.31 & DBP=77.8±3.45) group. After exercise the SBP (163.28 mmHg ±12.34) was significantly high in overweight when compared to normal weight (SBP=150 mmHg ±7.48). DBP was decreased in overweight (DBP=63.14 mmHg ±5.64) when compared to normal weight (DBP=66 mmHg±2.49) but not statistically significant. After 5 minutes of recovery, SBP (=127.71 mmHg ±9.6) & DBP (=81.14 mmHg ±7.3) among overweight were significantly higher (p<0.05) as compared to normal weight (SBP=119.4 mmHg ±9.6 & DBP=74.2 mmHg±3.7).

**CONCLUSION:** The overweight had high resting blood pressure and showed increased response to exercise as compared to normal weight group. The resting SBP and DBP were significantly correlated with BMI. The blood pressure response to exercise is an useful method to evaluate cardiac status and in early detection of individuals at risk for the development of cardiovascular diseases in overweight and obese young adults.

**CV24PP**
CARDIOVASCULAR RESPONSE TO CHRONIC TOBACCO SMOKING WITH REFERENCE TO ELECTROCARDIOGRAM AND BLOOD PRESSURE.
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In India smoking is a common habit prevalent in both urban and rural areas. Cigarette smoking has extensive effect on cardiovascular function and is clearly implicated in the etiology of number of cardio-vascular diseases particularly atherosclerosis, myocardial infarction and hypertension. Coronary heart diseases are now leading cause of death in many developed countries. In U.K.30 % of these deaths are due to smoking .Smoking causes chest pain on exertion. Atherosclerotic narrowing of smallest coronary arteries is increased in heavy and moderate smokers.

All attempts have been made to study cardiovascular functions among smokers and non-smokers populations in a rural area at rural medical College Loni (Ahmednagar, Maharashtra). Blood pressure and electrocardiogram were recorded in 100 healthy male subjects comprising of 50 healthy smokers and 50 non-smokers. Systolic blood pressure and heart rate are increased immediately after smoking.

Keywords: Smokers; Cardio-vascular response; Electro-cardiogram; Blood pressure.

STUDY OF CARDIOVASCULAR RESPONSE TO MENTAL AND PHYSICAL STRESS IN FIRST YEAR MEDICAL STUDENTS.

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OBJECTIVE: To study and compare cardio-vascular response to mental stress, physicals tress & combined stress in first year medic al students & to study which stress has pro found effect on cardiovascular response.

METHODS: Study was carried out on 100 healthy students in age group 18-22 years from first year of Seth G. S. Medical College & K.E.M. Hospital, Mumbai. With proper consent cardiovascular responses were assesse d by measuring the changes in pulse rate and blood pressure to 5 min of static handg rip, mental arithmetic, and the combined stimuli in random order. Subjects performed 5 min of static left handgrip exercise at 30 % of their maximal left handgrip force. Subjects were asked to perform 5 min of mental arithmetic aloud, consisting of sequential subtraction of 1-2 digit integers from 4-5 digit integers as fast as possible. Then performed both the challenges simultaneously for 5 minutes.

RESULTS: Statistical analysis showed significant changes in Systolic Blood Pressure, Di astolic Blood Pressure, Pulse rate & Mean Arterial Pressure with each of the stresses.It also showed that combined stress has maximum effect on cardiovascular system.

CONCLUSION: Combination of mental & physical stresses elicits greater cardiovascular response than either mental or physical stress alone. Students should use relaxation techniques in between periods of stresses.
THE ROLE OF NCX, VOLTAGE GATED L TYPE CALCIUM AND FUNNY CURRENTS IN THE RHYTHM GENERATION OF RAT HEART.
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OBJECTIVE: To study the involvement of NCX (I_{NCX}), Voltage gated L type calcium (I_{CaL}) currents and funny current (I_f) in the rhythm generation of rat heart using Diltiazem and Ivabradine.

METHODS: After intraperitoneal anaesthesia with Ketamine, hearts were dissected out from the thoracic cavity of adult Wistar rats. They were perfused retrograde through the aorta in a Langendorff perfusion system with oxygenated mammalian Ringer at a temperature of 37 degree Celcius. The ECG was recorded using surface electrodes kept in contact with the surface of the heart. The data was recorded on a computerized data acquisition system. After stabilization of the recording for 15 minutes with normal solution, the solution was changed to 10µM Diltiazem solution in experiment I and 10µM Ivabradine solution in experiment II.

RESULTS: Reported as mean ± standard deviation. Analysed using wilcoxon's signed rank test.
Experiment I: Heart rate before intervention was 100.1±13.2 bpm. 10 minutes after intervention it reduced to 39.4±20.9 bpm, showing a 60% reduction (p=0.043).
Experiment II: Heart rate before intervention was 129.4±10.6 bpm. 10 minutes after intervention it reduced to 74.7±10.65 bpm, showing a 42% reduction (p=0.043).

CONCLUSION: Diltiazem, a known organic calcium channel blocker, acts on I_{NCX} and I_{CaL}. Previous work in our lab has shown that it reverses sodium calcium exchanger. Ivabradine is an open channel blocker of I_f. The said currents are involved in the diastolic depolarization and depolarization phases of pacemaker potential. Both the drugs reduce the HR but do not abolish it completely, suggesting the presence of other rhythm generating mechanisms in the rat heart.

CV27PP

CORRELATION OF BODY MASS INDEX AND BLOOD PRESSURE AMONG YOUNG ADULTS.
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OBJECTIVE: Obesity is a potent risk factor of cardiovascular disease. From this study we can establish a correlation between increased Body Mass Index (BMI) and incidence of hypertension among young adults for predicting future progression of cardiovascular disease.

METHODS: 220 (74 males, 146 females) young adults of mean age 18.53±0.96 years (mean±SD) were included in the study. Height and weight were measured for calculating BMI. Blood pressure was measured using ELKOS sphygmanometer. Statistical analysis was done by SPSS 16.

RESULTS: 33.8% of males had increased BMI (BMI > 24.9) and 64% of them were
hypertensive. In females, 25.3% had increased BMI among whom 45.9% were hypertensive. Diastolic blood pressure (DBP) was increased in 40% males and 32.4% females while systolic blood pressure (SBP) was increased in 24% males and 13.5% females. In case of subjects with normal BMI, incidence of hypertension was more in males (26.5%) than females (7.3%) with diastolic hypertension more common than systolic hypertension in both the sexes. In hypertensive females with normal BMI, all had high DBP while in males, 46.2% had high DBP and 53.8% had both increased SBP and DBP.

CONCLUSION: BMI in young subjects is one of the easily computed and most important guides to establish the progression of future cardiovascular disease. As BMI increases, the incidence of hypertension increases. Male subjects are more vulnerable for hypertension than females. Diastolic hypertension is more prevalent in young adults than systolic hypertension in overweight and/or obese and also for subjects with normal BMI.

CV28PP

TO STUDY THE EFFECT OF LEVEL OF BLOOD PRESSURE APPARATUS IN RELATION TO HEART ON BLOOD PRESSURE IN MEDICAL STUDENTS.

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OBJECTIVE: Blood pressure measurement is a routine procedure in clinics & hospitals, during BP recording it is common practice to keep blood pressure apparatus at the level of heart assuming that it is the right procedure.

In reality blood pressure apparatus should be kept at the level of examiner's eye, so that Hg level should be read correctly. The guidelines of Hypertension Societies (British Hypertension Society, American Hypertension Society, European Hypertension Society) regarding procedure of recording blood pressure did not mention about the level of blood pressure apparatus in relation to the heart. Therefore to remove this myth and to prove the same this study has been done in V.M.M.C. & Safdarjung Hospital, New Delhi.

METHODS: Fifty first year students (Age 17 to 22 years) chosen for the study. Ethical approval was taken from Institutional Ethical. Blood pressure was recorded by mercury sphygmomanometer in lying down position by same observer. Blood pressure was recorded by keeping apparatus at heart level (that means anterior axillary line), 16 inch above and 16 inch below. ANOVA with repeated measure is done. P value <0.05 is taken as significance.

RESULTS: Statistic: ANOVA with repeated measure was done. Mean age of the subjects was 18.5 years. Systolic blood pressure (Mean±SD), at heart level, above and below heart level were 127±13, 127±12 and 126±13 mm Hg respectively and Diastolic blood pressure were 87±7, 83±8, 82±7 mmHg respectively. Comparison of systolic blood pressure in among the three levels was not significant (p value = 0.41). Same way comparison of diastolic blood pressure shows non-significant result (p value = 0.3).

CONCLUSION: Change in the height of blood pressure apparatus from the level of heart does not affect the blood pressure readings.

CV29PP
AUTONOMIC MODULATIONS DURING ACADEMIC STRESS IN MEDICAL STUDENTS.

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OBJECTIVE: Viva-voce examination is a stressful encounter for most of the students. It is likely to affect the autonomic functions. A pilot study was conducted to assess the impact of viva-voce on Heart Rate Variability (HRV) in medical students.

METHODS: Eighteen male medical students in the age group of 18-20 years were included for the study. The recordings were done between 10 am and 1 pm. The recordings were done for six students each day who volunteered for the study. Lead II ECG was recorded using RMS Vagus HRV apparatus for five minutes before and immediately after the viva-voce. ECG was analysed using RMS vagus software and HRV parameters were estimated. All values were expressed as Mean ± Standard deviation. Statistical analysis Wilcoxon signed rank test. P< 0.05 was considered significant.

RESULTS: The time domain parasympathetic parameters show significant increase and frequency domain sympathetic parameters show significant decrease in their values. The changes observed before and after the viva are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Before viva</th>
<th>After viva</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMSSD</td>
<td>32.79 ± 16.4</td>
<td>38.73 ± 15.7</td>
<td>0.008</td>
</tr>
<tr>
<td>PNN50</td>
<td>15.6 ± 16.5</td>
<td>22.40 ± 18.8</td>
<td>0.007</td>
</tr>
<tr>
<td>NN50</td>
<td>36.50 ± 10.5</td>
<td>57.55 ± 10.5</td>
<td>0.022</td>
</tr>
</tbody>
</table>

CONCLUSION: The cardiac autonomic function exhibits parasympathetic dominance and withdrawal of sympathetic response after the viva voce examination.

CV30PP

INTER-RELATIONSHIP AMONG VARIOUS FACTORS AND CORONARY HEART DISEASE RISK IN YOUNG ADULTS OF AGE 18-22 YEARS

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AIM: To evaluate the CHD (coronary heart disease) risk profile of the sample by dietary and anthropometric observations.

OBJECTIVE: To relate the role of dietary factors with the occurrence of coronary heart disease risk factors among the sample with the help of co-efficient of correlation between five food groups and various coronary heart disease risk factors.

METHODS: In this study height, weight, body mass index, waist-hip ratio and blood pressure were measured in 60 volunteers including 30 males & 30 females of age 18-22 years. Dietary evaluation was done with a frequency questionnaire called as ‘Eating Smart Assessment’. To calculate coronary heart disease risk ‘RISKO’ scale was used.

RESULTS: There was significant correlation among five food groups and coronary heart disease risk factors as body mass index, waist-hip ratio, blood pressure and ‘RISKO’ score.
This correlation was strongly significant among those having positive family history of coronary heart disease and also it was more in males than females.

**CONCLUSION:** The diet containing high fat, high salt, low fiber and low natural vitamins-minerals results in increased body-mass index, waist-hip ratio and blood pressure which are known risk factors for coronary heart disease. Also heredity is major contributory factor towards developing these risk factors.

**CV31PP**

**CORRELATION OF BODY MASS INDEX WITH ARTERIAL BLOOD PRESSURE IN SCHOOL GOING CHILDREN – A CROSS-SECTIONAL STUDY.**

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**OBJECTIVE:** The present study was conducted to study the correlation of Body Mass Index with arterial Blood Pressure in school going children.

**METHODS:** A cross sectional type of study was carried out among 400 male students between the age group of 6-11 years selected from four different schools of Nanded district, during January 2011 to June 2011. Children were grouped as Group I: 6-8 yrs and Group II: 9-11 yrs with 200 students in each group. Height and weight was recorded & Body Mass Index (BMI) was calculated. Blood pressure was recorded as recommended by the fourth report on diagnosis, evaluation and treatment of high blood pressure in children.

**RESULTS AND CONCLUSION:** The statistical analysis was done using correlation test. There was significant positive correlation of systolic & diastolic blood pressure with Body Mass Index in both groups. We can conclude that BMI is possible important contributory factor associated with increased risk of developing elevated BP among school going children.

**CV32PP**

**COMPARATIVE STUDY OF SYMPATHETIC CARDIOVASCULAR PARAMETERS IN OBESE AND NON OBESE SCHOOL CHILDREN.**

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**OBJECTIVE:** Our study is undertaken to investigate the sympathetic cardiovascular parameters in obese school going boys in comparision with age-matched control group in southern Odisha.

**METHODS:** 40 Boys between age group of 12-16 were subjected to study out of which 20 were obese and overweight (BMI>25) and other 20 acting as control group.Cold pressure test and handgrip dynamometer tests was performed and heartrate and BP were taken during and after the maneuver as measures of cardiovascular parameters.

**RESULTS:** Base line DBP in Obese Boys prior to test was significantly higher. Increase in DBP response to cold pressure test and handgripped dynamometer in obese children varies in comparision to control group.

**CONCLUSION:** Obesity was found to affect DBP, SBP, and MAP which are indicative of
sympathetic cardiovascular parameters when compared with nonobese school children.

**CV33PP**

**CORRECTION FOR BP CHANGES IMPROVES THE STRENGTH OF CORRELATION IN CEREBROVASCULAR REACTIVITY BETWEEN BREATH HOLDING AND 6% CO2 BREATHING**

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**OBJECTIVE:** Changes in middle cerebral artery blood flow velocity (MCAV) to breath holding (BH) has been conventionally used as a simple method for assessment of cerebrovascular reactivity. Changes in MCAV are often influenced by associated changes in blood pressure (BP) produced by hypercapnia induced sympathetic stimulation or straining by the subject. The objective of the present study was to determine the relationship of cerebrovascular response to BH with respect to that of 6% CO2 breathing.

**METHODS:** The study was conducted in 33 patients of uncomplicated type II DM. Changes in MCAV was recorded using trans-cranial Doppler ultrasonography during baseline and in response to 30s BH and 6% CO2 breathing for 2 minutes. Simultaneous change in systemic arterial BP was recorded using non-invasive beat to beat BP recorder. Cerebrovascular reactivity was measured as both percentage changes in MCAV and Cerebrovascular conductance index (CVCi). CVCi was computed as MCAV/Mean arterial BP to correct for the influence of associated changes in BP on MCAV.

**RESULTS:** Percentage change in MCAV during BH (Breath holding index) corrected for time was positively correlated with percentage changes in MCAV during 6% CO2 breathing ($r = 0.3516; p = 0.0448$). Cerebrovascular reactivity during BH and 6% CO2 breathing were better correlated when expressed as percentage changes in CVCi ($r = 0.5418; p = 0.001$)

**CONCLUSION:** Cerebrovascular response to BH is better correlated with that of 6% CO2 breathing when changes in MCAV were corrected for associated changes in BP.

**CV34PP**

**ANALYSIS OF PERCEIVED STRESS, CARDIOVASCULAR AND CENTRAL NERVOUS SYSTEM CHANGES BEFORE AND AFTER MENSTRUATION IN THE AGE GROUP 18-22 YEARS.”**

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**AIM:** Analysis of perceived stress, cardiovascular and central nervous system changes before and after menstruation in the age group 18-22 years.

**OBJECTIVE:** To evaluate cardiovascular, central nervous system changes and perceived stress by using perceived stress scale before and after menstrual period.

**METHODS:** In this study, perceived stress, effect of stress on cardiovascular system i.e. pulse rate, blood pressure and weight, and on central nervous system i.e. visual and auditory
reaction time, was studied on 60 healthy female students between the age of 18 and 22 years during premenstrual and postmenstrual phase.

**RESULTS:** There was significant increase in perceived stress, pulse rate, blood pressure, weight, auditory reaction time (ART), and visual reaction time (VRT) during premenstrual period as compared to postmenstrual period.

**CONCLUSION:** The changes in cardiovascular and central nervous system could be attributed to fluid and salt retention due to ovarian steroids and exaggerated response to hormonal changes leading to decrease in the processing capability of central nervous system. It is not clear how stress may contribute to increased perimenstrual symptom severity, although stress-induced changes in ovarian hormone levels and neurotransmitters may be involved. Stress has been shown to cause hormonal changes through the HPO axis, causing alterations in ovarian hormones that may render a woman more susceptible to menstrual disorders.

**CV36PP**

**CARDIOVASCULAR REACTIVITY TO COLD PRESSOR TASK IN YOUNG ADULTS WITH HYPERTENSIVE PARENTS**

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**OBJECTIVE:** Obesity, diabetes mellitus, and genetic predisposition are risk factors for the development of essential hypertension (HT). Since HT is becoming more prevalent in rapidly urbanizing areas, efforts are being made to diagnose and treat those affected by this disease, as well as to identify individuals who may develop future HT. Cardiovascular reactivity (CVR) to cold pressor task has been successfully used to predict future hypertension in adults. This study was carried out to find out if genetic predisposition to HT is apparent in young adulthood.

**METHODS:** Cold pressor task (CPT) was performed on young adults (18-25 years), 82 subjects (38 female) with normotensive parents and 41 subjects (18 female) with both parents hypertensive. Cardiovascular reactivity was monitored in terms of changes in pulse and blood pressure accompanying CPT.

**RESULTS:** Resting blood pressure was significantly higher in females with both parents hypertensive (F-2HT) compared to females with normotensive parents (F-2NT). Resting pulse and BP were both higher in males with both parents hypertensive (M-2HT) than those with normotensive parents (M-2NT).

The CVR was higher in female and male subjects with both hypertensive parents. In case of subjects with normotensive parents, F-2NT showed higher CVR than M-2NT, while in subjects with both hypertensive parents, the M-2HT showed significantly higher CVR than the F-2HT group.

**CONCLUSION:** The genetic influence of hypertension becomes apparent in early adulthood in both female and male offspring. Since the CVR was lower in female subjects with both parents hypertensive, the effect of genetic predisposition to hypertension is more in male offsprings.
CV37PP

AUTONOMIC FUNCTION IN DIFFERENT AGE GROUPS.

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OBJECTIVES: Age related impairment in the autonomic control of the heart is a causal component for increased risk of cardiovascular and chronic diseases. The effect of age on autonomically mediated cardiovascular responses to certain maneuvers was studied in 62 Subjects. The healthy subjects were divided on the basis of age in three groups young subjects (mean age 33.9±5.21yrs), middle age subjects (54.85±3.88 yrs) and old subjects (mean age 68.27±6.25yrs).

METHODS: After taking well informed consent parasympathetic function tests namely deep breathing test, heart rate response to lying to standing and Valsalva maneuver were done using fully automatic ECG machine and sympathetic function tests namely sustained handgrip test (rise in diastolic BP after sustained handgrip) and blood pressure response to lying to standing were measured using mercury sphygmomanometer, under thermo neutral conditions and at the same time of the day.

RESULTS: Results were analyzed statistically by one way ANOVA. Results show statistically significant decline in parasympathetic status with age from young towards middle age and from middle age to old age as determined by all three tests (p value < 0.001). Similarly both sympathetic function tests show statistically significant decline in sympathetic status with age i.e. from young to middle age (p value < 0.001) and from middle towards old age (p value < 0.001). Variation of BMI in both group was insignificant (P=0.70).

CONCLUSION: Autonomic (sympathetic and parasympathetic) status of the subjects decline consistently with age and this decline was significant in contrast to previous studies results. Physicians have to bear in mind the age related impairment of autonomic functions while evaluating cardiovascular and chronic diseases in elderly.

CV38PP

COMPARATIVE STUDY OF COLD PRESSOR TEST BETWEEN BLIND CHILDREN AND NORMAL SIGHTED CHILDREN IN THE AGE GROUP OF 10-17 YEARS.

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OBJECTIVE: To compare the effects of Cold pressor test in blind children and normal sighted children of the same age group.

METHODS: Thirty blind children from School for Blind, and 30 normal sighted children from primary and high schools at Belgaum in age group of 10-17 years were selected for cold pressor test. Subject rests in supine and blood pressure was measured in right upper arm. Left hand was then immersed to just above the wrist in cold water (3° to 5°C) for 1 minute; blood pressures were measured at 30, 60, and 120 seconds after immersion. Children were regrouped as Hyperreactors...
(criteria of a rise of more than 22 mmHg systolic and 18 mmHg diastolic blood pressure respectively).

**RESULTS:** Paired and unpaired T test were used for analysis of following parameter - Differences between: Baseline SBP among cases and controls, Maximum SBP among cases and controls; Maximum rise in SBP among cases and controls; Baseline SBP among hyperreactors and normoreactors; maximum SBP among hyperreactors and normoreactors; maximum rise in SBP among hyperreactors and normoreactors. Among these, comparison of baseline SBP to maximum SBP of cases and controls, maximum SBP and maximum rise in SBP among hyperreactors and normoreactors showed significant difference.

**CONCLUSION:** Number of hyperreactors are more in blind children than in normal sighted children; that is 9 out of 30 blind children and 4 out of 30 children with normal vision were found to be hyperreactors.

**Key words:** Cold pressor test, Hyperreactors, Normoreactors

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**CV39PP**

**STUDY OF CARDIOVASCULAR AUTONOMIC FUNCTION ON SOCIO-ECONOMIC STATUS.**

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**OBJECTIVE:** To establish relation of socioeconomic status with cardiovascular autonomic function.

**METHODS:** The study was done on 200 cases among Medical Students of Jorhat Medical College, Jorhat, in age group 18-35yrs. All the 200 cases were divided into three groups according to Kuppuswamy scale. 1-upper middle class. 2- middle class. 3-lower class. The following instruments were used: 1-electrocardiograph. 2- sphygmomanometer. 3- Handgrip dynamometer 4- Weighing machine 5-anthropometer 6-stthescope. For parasympathetic function the following test were performed. 1- Deep breath test. 2- Valsalva test. For sympathetic function the following test were performed. 1- Standing test for orthostatic hypotension. 2- Hand grip test.

**RESULTS:** The influence of socioeconomic status on cardiovascular autonomic function was established. There was significant increase in hand grip test in lower socioeconomic status compared to upper middle class p-value>0.05 and decrease in valsalva ratio in lower socioeconomic status people compared to upper middle class with p value>.05.

**CONCLUSION:** Impaired cardiovascular autonomic function was strongly associated with lower socioeconomic status and accounted for a major proportion of the correlation between socioeconomic status and mortality. So the importance of study of autonomic function should be given stressed.

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**CV40PP**

**HEART RATE VARIABILITY AND ITS CORRELATION WITH PULMONARY FUNCTION TEST OF SMOKERS.**

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**OBJECTIVE:** was to study if there was a correlation if any between PFT and HRV.

**METHODS:** 30 male subjects were included in the study who were chronic smokers of at least 10 pack years and another 30 age, sex and anthropometrically matched control. PFT and HRV was performed on these subjects and correlation was statistically derived. Statistical analysis used: Spearman's correlation coefficient was used for analysis of HRV and PFT. Multiple stepwise regression analysis was used subsequently.

**RESULTS:** HF ms^2 and LFms^2 showed correlation coefficient of 0.378 & -0.383 with FEV1 and PEFR respectively. It was found that only FEV1/FVC was having statistically significant regression coefficient with HF ms^2, the R value was found to be 0.425 while with other parameters it was not significant.

**CONCLUSION:** Since there is correlation between PFT parameters (PEFR and FEV1) and HRV parameter (LFms^2 and HFms^2), this can help us in predicting cardiac morbidity in chronic smokers. So HRV should be included as a routine test along with PFT in chronic smokers for early diagnosis of cardiac involvement.

**CV41PP**

**EFFECT OF HAND DOMINANCE & BODY MASS INDEX ON MAXIMAL ISOMETRIC HANDGRIP STRENGTH IN NORMAL YOUNG ADULTS.**

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**OBJECTIVE:** Handgrip strength (HGS) is an important test to evaluate physical fitness & nutritional status. It is a physiological variable affected by various factors including age, gender, body size, posture, hand dominance. HGS provides an objective index of functional integrity of upper extremity. It assesses the patient's initial limitations & provides a quick assessment of patient's progress throughout the treatment. So the aim of present study was to measure & compare maximal isometric HGS using handgrip dynamometer between dominant & non-dominant hands of males & females & its relationship with Body mass index (BMI) in normal young adults of age 18-26yrs.

**METHODS:** 100 normal, healthy individual of either sex (73Males, 27Females) of 18-26yrs. BMI & HGS were measured in standard arm position using handgrip dynamometer. Data was analysed using Mann-Whitney test & Pearson correlation

**RESULTS:** Statistically significant difference (p<0.001) was found for HGS both in males & females between dominant & non-dominant hands. Statistically significant difference (p<0.001) was found for HGS in dominant & non-dominant hand among males & females. Negative correlation was found between HGS & BMI in both males & females.

**CONCLUSION:** HGS is greater in dominant hand compared to non-dominant hand both in males & females. HGS is greater in both dominant & non-dominant hand in males when compared to that in females. Negative correlation was found between HGS & BMI in both males & females.

**CV42PP**

**MODERATE DEPRESSION DOES NOT INCREASE THE CARDIAC MORBIDITY.**
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**OBJECTIVE:** In the modern scenario, depression is one of the major clinical problems affecting millions of people globally. The psychological disorder is multifaceted and it affects an individual's mental and physical health. Depression is well associated with the comorbid cardiac diseases. The present study has been designed to assess the cardiac stress associated with the moderate depression.

**METHODS:** This study was conducted in Department of Physiology and Department of Psychiatry at Pt. B. D. Sharma, PGIMS, Rohtak. The study is a randomized controlled trial. Thirty male patients of moderate depression (group-I) according to ICD-10 (the international classification of diseases-10) in the age group of 18-40 years and thirty normal (group-II) age matched male subjects were compared by galvanic skin response (GSR). Informed and written consent was taken from every patient and subject for undergoing the whole procedure. All experiments were conducted between 10am to 1pm to avoid diurnal variations.

**RESULTS:** No significant association was found between group-I (patients of moderate depression) and group-II (normal subjects) as comparisons of all the parameters were statistically insignificant.

**CONCLUSION:** Though the major depression is associated with various co-morbid conditions but moderate depression hardly affects the autonomic system. Hence the cardiac stress is minimal in case of moderate depression.

**CV43PP**

**THE EFFECT OF AFFECTIVE PICTURES ON HEART RATE VARIABILITY (HRV) - A PILOT STUDY.**

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**OBJECTIVE:** To assess heart rate variability in response to negatively and positively valenced pictures methods. One hundred and two International Affective Picture System (IAPS) photographs were grouped into 3 sets of 34 photographs: neutral, positive and negative. Each picture in a set was displayed for 6 seconds followed by 3 second interval before the next picture. The study was conducted in 14 healthy male students [age=25(24-26)]. Each student was shown three sets of stimuli and their ECG was recorded simultaneously for 5 minutes. Time and frequency domain variables of HRV were calculated and compared among different sets of stimuli. Statistical significance was tested with Friedman test. P value < 0.05 was considered significant.

**RESULTS:** Sympathetic (LF pr, LFnu, LF/HF) and parasympathetic indices (SDNN, RMSSD, NN50cnt, HFpr , HFnu) of HRV analysis in three different sets of stimuli were insignificant when compared among the sets.

**CONCLUSION:** Affective pictures shown in our study had no effects on cardiac sympathetic and parasympathetic activity.

**CV44PP**
A COMPARATIVE STUDY OF MEAN CARDIAC AXIS IN CENTRAL OBESITY VS OVERALL OBESITY

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OBJECTIVE: The objective of this study was to describe and compare mean cardiac axis based on body mass index and waist circumference & waist-hip ratio.

METHODS: Study was conducted on 71 students participants from GSL educational society and BPS Govt. Medical College for Women, that includes females (n= 37 with mean value of 19.89 ±3.09) and males (n= 34 with mean value of 22.47 ± 3.04). Written informed consent was taken from the entire participant. A predefined selection criteria was applied for selection of the study group. Anthropometric measurements of participants were taken while they stand in light clothing without shoes, using a standard protocol. A standard electrocardiogram (ECG) was obtained. Calculation of axis was performed and interpreted for assessment of cardiac axis. The participants in the study were classified into three groups based on the BMI: a normal weight (control) group had a BMI of < 25 kg/m², an overweight group was classified as a BMI between 25–29.9 kg/m², and an obese group was classified as BMI ≥ 30 kg/m². Statistical analysis was performed using SPSS package. Probability values of p < 0.05 was considered significant

RESULTS: The mean cardiac axis (MCA) was higher (more positive) amongst female individuals compared to male individuals however it was not significant (p >0.05). A wide variation in the MCA amongst male individuals may be a contributory factor for non significant result. A significant negative correlation was observed between MCA and BMI (p Value 0.01), MCA and WC (p <0.05), negative correlation between MCA and MAP; however it was not significant (p Value 0.06).

CONCLUSION: There was no significant difference in body mass index (BMI) between male and female participants. As a whole there was a negative correlation of MCA with waist circumference (WC), BMI, body surface area (BSA) and height. The highest significant result of MCA was observed based on WC. It means central obesity has a greater impact on cardiac performance than other anthropometric parameters.

MCA is very important parameters for the study of cardiac geometry as well as electrical activity of the heart. Obesity based on BMI and WC adversely affect mean cardiac axis. Therefore while interpreting ECG these anthropometric parameters should be taken into consideration before making a final diagnosis of structural, functional and conduction disturbance of the heart.

CV45PP
DYSLIPIDEMIA IN SMOKELESS TOBACCO CONSUMERS - ROAD TO ATHEROSCLEROTIC CARDIOVASCULAR DISEASE.
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OBJECTIVES: The objectives were to assess lipid profile in smokeless tobacco users and to find out its association with serum cotinine level.
**METHODS:** A case control study was designed. Total of 50 exclusive smokeless tobacco users without any other illnesses and age and sex matched healthy control subjects (50) with similar socio-cultural background were assessed for clinical details, dietary habits, physical activities and pattern of smokeless tobacco consumption. Standard method were adopted to check the lipid levels. Serum cotinine levels were analysed with ELISA kit. The data were analyzed statistically.

**RESULTS:** In ST users the mean value of total cholesterol, HDL, LDL, VLDL, triglycerides and LDL/HDL ratio were 200.88 mg/dl, 39.44 mg/dl, 131.07 mg/dl, 30.38 mg/dl, 151.91 mg/dl and 3.33 whereas in controls the respective values were 148.12 mg/dl, 50.50 mg/dl, 75.90 mg/dl, 21.73 mg/dl, 108.64 mg/dl and 1.59. Difference in lipid parameters of cases and controls were statistically significant. All the parameters were significantly associated with high mean serum cotinine level.

**CONCLUSION:** Consumption of smokeless tobacco for long duration results in high cotinine level which in turn causes dyslipidemia.

**Key words:** ST (smokeless tobacco), cotinine, dyslipidemia.

**CV46PP**

**ASSESSMENT OF COGNITIVE PERFORMANCE IN HYPERTENSIVE AND NORMOTENSIVE INDIVIDUALS IN THE AGE GROUP OF 30-40 YRS.**

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**OBJECTIVES:** Assessment of cognitive performance in hypertensive and normotensive individuals in the age group of 30-40 yrs. To establish the correlation between hypertension and cognition impairment in adult age group.

**METHODS:** This study was conducted in Seth GSMC and KEMH Mumbai on 90 patients attending medicine out-patient department. Study consisted of 45 hypertensive and 45 normotensive individuals. In both groups Blood Pressure was assessed by Sphygmomanometer and cognition status was assessed by MoCA scale (MONTREAL COGNITIVE ASSESSMENT SCALE). The scores were analyzed statistically.

**RESULTS:** Out of 45 hypertensive patients 31 showed lower MoCA score, 14 showed normal MoCA score, and within normotensive patients 32 showed normal MoCA score and 13 showed lower MoCA score.

**CONCLUSION:** Assessing this study statistically showed the difference in cognitive function of hypertensive and normotensive individuals.

**CV47PP**

**RELATIONSHIP OF INTERARM PRESSURE DIFFERENCES WITH ANTHROPOMETRIC VARIABLES.**

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**OBJECTIVES:** To find out relationship of Interarm pressure difference. 2 To find out
relationship of anthropometric variables with interarm pressure difference.

**METHODS**: A Cross sectional observational study was designed. Total 100 first year medical student were randomly selected and enrolled. Blood Pressure in both arm was recorded in supine position, anthropometric measurements were taken. Family history of Diabetes and hypertension was also recorded.

**RESULTS**: Average blood pressure in right arm is found to be 114mmhg and in left arm it is 117.5mmhg. Out of 100 subjects, total 30 subjects have pressure difference of <5 mmHg, 40 subjects have between 5-10 mmHg and 6 subjects have >10mmhg. Interarm pressure difference of 10mmhg or more is found in subjects of WHR >0.9 and having family history of Diabetes or Hypertension.

**CONCLUSION**: Subjects having interarm pressure difference >10 mmHg are found to be associated with family history of Diabetes and hypertension with Waist Hip ratio >0.9. These subject are more prone to develop CAD or metabolic syndrome in future.

**Key words**: WHR –waist hip ratio

**CV48PP**

**OBJECTIVES**: Endogenous Cushing’s syndrome is associated with a higher risk of cardiovascular morbidity and mortality. Previous literature suggested multiple possible links by which hypercortisolism may alter the autonomic control of cardiovascular functions. We investigated the impact of chronic endogenous hypercortisolism on autonomic regulation of cardiac functions by short term heart rate variability (HRV) analysis.

**METHODS**: Eighteen patients of endogenous Cushing’s syndrome and twenty age, gender and BMI matched controls participated in the study. ECG signal was acquired in lead II configuration for 5 minutes and HRV assessment was made in both time and frequency domain using the extracted RR interval data.

**RESULTS**: All time and frequency domain measures of HRV were significantly (p<0.05) lower in the patient group when compared to the control group. Patient group had an altered sympatho vagal balance with LF/HF ratio significantly higher than the control group [1.857 (0.6747 - 2.610) vs 0.8581 (0.4779 - 1.352); p = 0.0253] as measured by HRV. A significant negative correlation was obtained between normalised high frequency power of heart rate variability and basal cortisol levels (r = -0.6594; p = 0.0029). Multiple linear regression analysis identified age, disease duration in months, basal cortisol levels and systolic blood pressure as independent predictors of normalised high frequency power.

**CONCLUSION**: Findings of the study clearly demonstrate the diminished autonomic modulation of heart rate in endogenous Cushing’s syndrome and its possible relationship with hypercortisolism as the
main causative factor. Diminished heart rate variability may be an indicator of the increased risk of cardiac mortality in these patients.

**CV50PP**

**GENDER DIFFERENCES ON SYMPATHETIC FUNCTION**

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**OBJECTIVES:** To assess the sympathetic function among male and female volunteers in the age group of 18 – 25 years and to analyse the gender differences.

**METHODS:** 20 male and 20 female Subjects in the above mentioned age group were selected based on the criteria for inclusion and exclusion. Data was recorded in the Department of Physiology, SSIMS & RC, Davangere after written informed consent using AD Instruments- power lab 26T, Australia. Sympathetic function was then assessed using Heart Rate Variability, Isometric Hand Grip Test, Heart rate response to deep breathing and valsalva, blood pressure response to change in posture.

**RESULTS:** Males have a sympathetic predominance when compared to females with a P value of <0.05, which is statistically significant.

**CONCLUSION:** This study proves the hypothesis that there is a substantial evidence of gender difference in autonomic functioning which can be attributed to the one or more variables like male and female sex hormones, personality characters, genetic determinants and social factors which may contribute directly or indirectly.

**CV51PP**

**ROLE OF ASCORBIC ACID IN CARDIOVASCULAR PERFORMANCE DURING ACUTE HEMORRHAGE IN ANESTHETIZED RATS.**

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**OBJECTIVES:** Acute hemorrhage is associated with a decrease in cardiac function and contractility, increase in heart rate and fall in blood pressure. Decreased myocardial function and contractility have been shown to be caused by generation of free radicals in the ischemic myocardium. These toxic effects can be significantly attenuated by pretreatment of animals with superoxide dismutase and catalase, suggesting the involvement of free radicals in the depression of cardiovascular function. In the present study, the role of ascorbic acid as a free radical scavenger in protection from the deleterious effects of excess blood loss was examined.

**METHODS:** The study was conducted on healthy anesthetized Wistar rats of either sex weighing between 250-300 g. After anaesthetizing rats with urethane (1g/kg), trachea was cannulated and rats were ventilated with room air (mean tidal volume=5 ± 1 ml/kg), using a small animal respirator. Catheterisation was done to measure arterial blood pressure, left ventricular pressure, cardiac contractility and heart rate. All parameters were recorded on a polygraph. Hemorrhage was induced by withdrawing 40% of estimated total blood (7% of body weight) volume in steps of 10%
each at 10 min intervals. Arterial blood samples were withdrawn at each step for malondialdehyde (MDA) estimation. After inducing 40% hemorrhage, ascorbic acid was given as a bolus injection (70 mg / kg) in one group whereas; the other group received a continuous slow infusion of ascorbic acid (15 mg / min for an hour). After treatment, all the above-mentioned cardiovascular parameters were recorded and MDA estimation was done at 1, 15, 30, 45 and 60 min in both the groups.

RESULTS: A fall in all the cardiovascular parameters was observed on hemorrhage. MDA rose from the basal level of 2.56 ± 0.7 nmol / dl to 3.3 ± 1.0 nmol / dl (p<0.05). Immediately after treatment, MDA level fell to 0.76 ± 0.03 nmol / min. This transient rise in MDA level observed at 40% blood loss suggests involvement of free radicals in the pathogenesis of the consequences of hemorrhage. Administration of ascorbic acid resulted in the recovery of hemodynamic parameters, which were adversely influenced by the induction of hemorrhage.

CONCLUSION: Our results demonstrate the involvement of oxidants in hemorrhage-induced cardiovascular depression and cardioprotection by ascorbic acid, an antioxidant. The restoration of cardiovascular parameters towards normalcy by ascorbic acid was largely due to its antioxidant activity with a smaller contribution by the auto regulatory compensatory mechanisms.

EN01PP

A COMPARATIVE STUDY OF INSULIN RESISTANCE IN PREMENOPAUSAL AND POSTMENOPAUSAL BREAST CANCER PATIENTS

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OBJECTIVE: To compare insulin resistance in premenopausal and postmenopausal breast cancer patients.

METHODS: The study included 26 premenopausal and 26 postmenopausal women with breast cancer from M S Ramaiah hospitals. The two groups were BMI matched. Their fasting serum glucose level was measured by glucose oxidase peroxidase method and fasting serum insulin was measured by ELISA technique.

Insulin resistance was calculated by homeostasis model assessment-insulin resistance (HOMA-IR) method. Student’s t-test (independent, 2-tailed) was carried out to compare the differences in the insulin resistance between the two groups.

RESULTS: It was observed that mean±SE of insulin resistance was 2.35±0.65 and 2.37±0.53 in premenopausal breast cancer cases and postmenopausal breast cancer cases respectively. This difference was not found to be statistically significant (p=0.982).

CONCLUSION: After matching for the BMI among the premenopausal and post menopausal breast cancer cases, there was no significant difference found in their insulin resistance.

This suggests that there was no variation in the insulin resistance between the premenopausal and postmenopausal breast cancer patients.

EN02PP
THE DIAGNOSTIC VALUE OF VIBRATION PERCEPTION THRESHOLD AS A MEASURE OF PERIPHERAL NEUROPATHY IN TYPE 2 DIABETES MELLITUS

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OBJECTIVES: To evaluate validity of Vibration Perception Threshold (VPT) in diagnosing peripheral neuropathy in Type 2 Diabetes Mellitus considering Nerve Conduction Studies (NCS) as gold standard.

METHODS: Ten patients in the age group of 40 to 60 years with established diabetic neuropathy, diagnosed by NCS were selected as cases. Ten age and sex matched healthy adults who had normal NCS were selected as controls. Conventional sensory and motor nerve conduction studies were measured using 4 channel digital Electroneuromyograph (ENMG), Nihon Kohden – model Neuropack Japan. Vibration Perception Threshold was tested using Sensitometer, Dhansai laboratory, Mumbai in all cases and controls for both feet on eight areas. VPT value of more than 25 volts was considered as abnormal.

RESULTS: Validity of Vibration Perception Threshold was calculated by comparing it with nerve conduction studies and its sensitivity was found to be 80%, Specificity 90%, and Positive predictive value was 88.9%

CONCLUSION: Thus the diagnostic value of Vibration Perception Threshold is comparable to Nerve Conduction Studies in diagnosing peripheral neuropathy.

EN04PP

CORELATION OF PRE MENSTRUAL SYNDROME AND BODY MASS INDEX AMONG YOUNG ADULT FEMALES.

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OBJECTIVES: To evaluate the corelation of Premenstrual syndrome with Body mass index among young adult females.

METHODS: This is a cross sectional descriptive study conducted in 100 randomly selected medical, dental and nursing female students. All the participants were given a pre designed questionnaire to complete. The questions were based on demographic, anthropometric and variations in menstrual pattern including pre menstrual syndrome. All the participants were given 30 minutes to complete the questionnarie. Anthropometric measurements were taken by a standard weighing machine and measuring tape.

RESULTS: The mean age at menrache is 12.82 in years (±1.298). The mean age and mean body mass index was found to be 18.34 in years(±9.66) and 21.98(±3.67). The prevalence of obesity was 19%. Out of 19 obese adult female, 17 (89.47%) found to have pre menstrual syndrome. Correlation of age with age at menarche and age with body mass index are found to be significant (p=<0.001)

CONCLUSION: Premenstrual syndrome is more prevalent among adult females, Increase in bodymass index is highly related with body mass index.

EN05PP
BRAINSTEM AUDITORY EVOKED RESPONSE AND PHASES OF MENSTRUAL CYCLE.

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OBJECTIVES: To study the effect of different phases of menstrual cycle on Brainstem Auditory Evoked Response.

METHODS: We did a study on 50 audiometrically normal, healthy eumenorrheic female students of Government Medical College, Patiala in age group of 18-24 years. Brainstem Auditory Evoked Response was recorded using the instrument RMS EMG EP MARK II across the three phases of the menstrual cycle. Recordings were taken and statistically analyzed.

RESULTS: The difference in duration of waves and Inter Peak Latencies of Brainstem Auditory Evoked Response in three phases of menstrual cycle was not statistically significant.

CONCLUSION: The different phases of menstrual cycle do not seem to influence Brainstem Auditory Evoked Response.

EN06PP

CORRELATION BETWEEN INSULIN RESISTANCE AND OBESITY IN UNCOMPPLICATED TYPE 2 DIABETES MELLITUS PATIENTS
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OBJECTIVES: Type 2 diabetes mellitus (DM) is associated with obesity and insulin resistance (IR). The aim of the present study was to find the correlation between parameters of obesity and IR in the patients of type 2 DM.

METHODS: In 35 uncomplicated type 2 diabetic patients body weight, waist circumference (WC) and body mass index (BMI) were used as obesity indices. Homeostasis Model Assessment for Insulin Resistance (HOMA-IR) and fasting plasma insulin (FPI) were chosen as insulin resistance indices.

RESULTS: The measured BMI and waist circumference were found to be 24.87±3.44 Kg/M² and 97.71 ± 9.09 cm. The estimated HOMA-IR was 3.426 (2.48 – 4.87) and FPI was 9.59 (8.01 – 12.44). HOMA-IR was found to be significantly correlated with waist circumference (Pearson r = +0.35, p = 0.04) but not with BMI (Spearman r = +0.20, p = 0.26). No significant correlation of FPI levels were found either with waist circumference (Pearson r = +0.28, p = 0.11) or with BMI (Pearson r = +0.20, p = 0.24).

CONCLUSION: Insulin resistance estimated by HOMA-IR correlates with waist circumference in type 2 DM.

EN07PP

ROLE OF BRAINSTEM AUDITORY EVOKED POTENTIAL (BAEP) IN TYPE 2 DIABETES MELLITUS
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OBJECTIVES: There are many studies showing involvement of peripheral and autonomic nervous system in type 2 diabetes but very few evidences for central diabetic neuropathy are present in the literature. Therefore we aimed to evaluate whether brainstem auditory evoked potential (BAEP) study can be used for detecting central diabetic neuropathy at early stage of disease.

METHODS: Brainstem auditory evoked potentials (BAEPs) were studied in 30 patients of type 2 diabetes mellitus aged 46-75 years and compared with control group. Statistical analysis was performed by using t-test and Pearson’s correlation.

RESULTS: There was significant increase in right ear absolute peak latencies of waves I - V and latencies of waves I, II, V and IPL (inter peak latency) III – V of left ear in diabetic patients. There were no significant correlations between the duration of diabetes, glycemic levels of patients and the latencies of wave V of both ears.

CONCLUSION: Diabetes affects central nervous system early in course and that can be diagnosed easily by brainstem auditory evoked potentials.

EN08PP

PROPORTION OF IMPAIRED GLUCOSE TOLERANCE IN FIRST YEAR MEDICAL STUDENTS AND ITS CORRELATION WITH ANTHROPOMETRIC PARAMETERS.

OBJECTIVES: To determine the proportion of Impaired glucose tolerance (IGT) in female MBBS students and to correlate it with their body mass index(BMI), and waist-hip ratio.

METHODS: An observational cross-sectional study was conducted on forty first year MBBS female students in the department of Physiology, R.G. Kar Medical College & Hospital, Kolkata. Informed consent were taken. According to BMI, 200 students were grouped into four categories - normal, overweight, obese and morbidly obese. Among them ten students were randomly selected from each group. They underwent history taking, clinical examination and investigation (oral glucose tolerance test using the 75gm glucose to assess fasting and 2 hour post prandial plasma glucose concentrations). The World Health Organization diagnostic criteria was used to determine IGT. Data were analyzed by post-hoc Tukey test, Pearson correlation test using SPSS version17. A p value of < 0.05 was considered significant.

RESULTS: This study shows that prevalence of IGT is 5%. PPBS shows significant difference (p = 0.03) between the four groups, mean of PPBS is more in overweight group (126mg/dl) than normal(124mg/dl), obese (121mg/dl), morbidly obese group (112mg/dl) . PPBS shows significant positive correlation with Waist-Hip ratio(r=0.6, p< 0.05 ), not with BMI( r= 0.3, p>0.05). FBS does not show any significant changes between groups.
DISRUPTION OF MENSTRUAL CYCLICITY IN LOW BMI GIRLS

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BACKGROUND: It has been observed that low BMI affects the age of menarche and menstrual cyclicity which may result into fertility problems.

OBJECTIVES: To compare menstrual cyclicity in low BMI and normal BMI girls.

METHODS: BMI was calculated from 260 healthy females aged 18 -25 years. Menstrual cyclicity was noted for three consecutive cycles. Menstrual cycle characteristics were recorded as short (<25days), normal(26–34 days) or long (35 days), cycles were taken as irregular if there are 15 days between the longest and shortest cycle in the past 12 months 23. Age at menarche was also recorded.

RESULTS: On data analysis, 39% girls were of low BMI (<18.49Kg/cm2) there was statistically significant (p<0.001) difference in the onset of menarche and disruption of menstrual cyclicity in low BMI girls as compared to normal BMI girls. Details of the results will be discussed.

CONCLUSION: This difference may be attributed to low content of fat soluble sex hormones stored in the body's fat layers. Therefore these women produce reduced amount of estrogen which lead to an abnormal menstrual cycle or amenorrhea.

SERUM URIC ACID & NERVE CONDUCTION VELOCITY IN PREDIABETIC AND DIABETICS

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OBJECTIVES: Level of serum uric acid is variable with changing pattern of blood glucose level. Effects of uric acid relate to endothelial dysfunction by inducing anti proliferative effects on endothelium, impairing nitric oxide production and inflammation. Decreased Nerve Conduction Velocity in diabetics is probably one of the earliest neuropathic abnormalities and is often present even at diagnosis
1- Estimation of serum uric acid levels in prediabetic and diabetics.
2-Correlation of serum uric acid with neuropathy in prediabetic and diabetics.

METHODS: This was a cross sectional prospective study. A total number of 79 subject were enrolled for study, 16 Pre-Diabetic and 63 Diabetic subjects were enrolled from medical OPD and indoor wards. 4 ml of blood sample with drawn. Analysis done by uricase method. The presence of polyneuropathy was documented by evaluating the distal latencies, amplitudes, and conduction velocities.

RESULTS: Conduction velocity of diabetics is significantly lower than prediabetics. 50% Diabetics & 12% prediabetic showed sensory neuropathy. Diabetic subject showed 10-20% motor neuropathy. Serum uric acid of Pre diabetics negatively and significantly correlated with left Sural nerve (Velocity) In
contrast, Serum uric acid of Diabetics did not show any association with any of the neuropathy parameters

**CONCLUSION** Uric acid causes oxidative stress which may contribute to the pathophysiology of nerve injury in diabetics through defects in metabolic and vascular pathways.

**EN11PP**

**A COMPARATIVE STUDY OF LIVER FUNCTION TEST IN TYPE 1 AND TYPE 2 DIABETES INDIVIDUAL.**

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**OBJECTIVES**: This study was planned to compare liver function test by measuring Alanine aminotransferase (ALT), Aspartate aminotransferase (AST), And gamma glutamyl traspeptitase (GGT) in Type 1 And Type 2 Diabetes individual. 

**METHODS**: The study was conducted on 30 confirmed cases of Type 1 and another 30 confirmed cases of Type 2 Diabetes. Blood sample were collected and centrifuged. Serum ALT, AST and GGT were measured on Autoanalyser.

**RESULTS**: By applying t test, In the present study, mean values of ALT,AST and GGT were significantly elevated in Type 2 Diabetes as compared to Type 1 Diabetes individual.

**CONCLUSION**: Above result shows that,there were elevated level of ALT,AST and GGT in Type 2 Diabetes compared with Type 1 Diabetes Individual, which often reflect the important link among Glycemic control, insulin Resistance And hepatic function. Also suggests that Improved Glycemic control improves insulin resistance which can reduces mild elevation of Transaminases Level.

This study often shows that insulin improves liver function in Diabetes individual.

**EN12PP**

**NERVE CONDUCTION STUDY IN DIABETES MELLITUS PATIENTS**

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**OBJECTIVES**: Diabetes mellitus constitutes a growing concern to population at large all over the world. The world health organization (WHO) estimated that there were 135 million diabetics in 1995 and this number would increases to 300 million by the year 2025 (Pradeep et.al, 2002). The present paper was to assess the effect of diabetes and its duration on median nerve conduction velocity. Median nerve conduction velocity of diabetics was compared with the median nerve conduction velocity of age-matched control subjects.

**METHODS**: The present study was conducted on 100 subjects aged 30-60 years old, out of which 50 cases of clinically diagnosed diabetes mellitus and 50 age-matched controlled were taken from Mimhans Hospital, Meerut. Comparison of MNCV (Motor nerve conduction velocity) and SNCV (Sensory nerve conduction velocity) in diabetics was done by data controlled.

**RESULTS**: Following conclusions have been derived from the present study: (a)Mean MNCV in diabetics was found to be less than
mean MNCV of control subjects and the difference was found to be significant.
(b) Mean SNCV in diabetics was found to be less than mean SNVC of control subjects and the difference was found to be significant. (c) Mean MNCV and SNVC was found to decrease with increase in duration of diabetics and the RESULTS were found to be significant. (d) The conversion of excess glucose to orbital, and resulting depletion of myo-inositol that leads to reduce Na+ -K+ATPase activity are major metabolic factors responsible for nerve dysfunction. (e) Similar result had been observed in other studies. (f) Periodic NCS in diabetics’ patients will help in early diagnosis and treatment of diabetics’ neuropathy.

CONCLUSION: Now it is concluded that diabetic mellitus effects significantly median nerve conduction velocity (MNCV and SNCV).

EN13PP

A STUDY OF ANTHROPOMETRIC INDICES OF YOUNG ADULTS WITH FAMILY HISTORY OF DIABETES.

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OBJECTIVES: To study the correlation of anthropometric indices in young individuals with family history of diabetes.

METHODS: The present study was conducted in 164 healthy young medical students of age group 18 – 25 yrs, from which 82 were with family history of diabetes and 82 with no family history of diabetes (control group). Anthropometric measurements of height, weight, waist circumference, hip circumference were taken. Body mass index (BMI), waist - hip ratio (WHR), waist -height ratio (WHtR) was determined from these basic measures.

RESULTS: Statistical analysis was carried using SPSS software version 17.0 and student’ t test. The various anthropometric indices showed higher in subjects with family history of diabetes. BMI, Waist circumference, WHR were statistically more significant (p<0.05) in subjects with family history of diabetes as compared to control group (p >0.05). Among the subjects with family history of diabetes, 57.3% showed statistically significant increase in BMI >23kg/m2 (overweight).

CONCLUSION: The study concluded that, the anthropometric indices (Weight, Waist circumference, Hip circumference, BMI, WHR) were higher in young healthy adults of 18-25 yrs age having family history of diabetes. Hence, a check on these parameters may help in controlling the predisposing factors and therefore diabetes.

EN14PP

EFFECT OF ANTIOXIDANTS (VITAMIN E&C) AND OCIMUM SANCTUM(TULSI) ON BLOOD GLUCOSE AND SERUM LIPIDS IN DIABETIC AND HYPERTENSIVE PATIENTS.

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OBJECTIVES: Diabetes and hypertension are frequently occurring and closely related diseases. Hypotensive and hypoglycemic effect of antioxidants (vit. E&C) and tulsi leaves have been reported. Attempts have been made to determine quantitatively the effects of antioxidants and tulsi on serum lipids and blood sugar level and its possible
role as a substitute for oral hypoglycemic and hypotensive drugs. The aim of this study is to explore the hypotensive and hypoglycemic effect of antioxidants (vit. E&C) and tulsi leaves in diabetic and hypertensive patients.

METHODS: Eighty known patients of diabetes and hypertension, in the age group of 34-75 yrs were divided into control (n=20) and three study groups (n=20 each). In both groups BMI, HR, SBP, DBP, Lipid profile and blood sugar (fasting and PP) were recorded. The study groups were subjected to undergo antioxidants {Vitamin C (Tab- CELIN 500 mg of GlaxoSmithKline Drug Company), Vitamin E (Tab-EVINAL 400 mg of Alembic Limited) and tulsi (Tab-TULASI 250 mg of Himalaya Herbal Healthcare Pharmaceutical Company)}, Dosage of antioxidants is one Tab O.D each and B.D for tulsi for 45 days. After 45 days all parameters were re-recorded.

CONCLUSION: In this study, we observed a significant (<0.01) reduction in SBP, DBP, PR, Tc, Tg, LDL, VLDL and Tc/HDL in comparison between Pre and Post supplementation Parameters. While on comparing the study group with control groups we observed a significant reduction in SBP, DBP, PR, Tc, Tg and VLDL. We did not find any statistically significant change in Blood Sugar-(Fasting and P.P), HDL, LDL, Tc/HDL and LDL/HDL.

The results suggest that antioxidants (vit E&C) and tulsi (Ocimum Sanctum) has hypotensive effect markedly.

EN15PP

COMPARATIVE ANALYSIS OF CARDIOVASCULAR RESPONSES TO STRESS IN MENSTRUAL AND FOLLICULAR PHASE IN MEDICAL STUDENTS.

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OBJECTIVES:
- To study cardiovascular responses to stress in menstrual and follicular phases.
- To analyze the impact of menstrual phase on cardiovascular response to stress.

METHODS: 30 females between age group of 18 – 26 years in menstrual and follicular phases with 24-32 day menstrual cycle were selected according to inclusion/exclusion criteria. The following tests were performed:

Deep breathing test (E:I index), Lying to standing test (Postural index), Valsalva manoeuvre, Isometric hand grip test, Cold pressor test.

ECG was taken using limb leads.

RESULTS: Paired t-test was used for analysis. Values are expressed as mean±S.D.

E:I index in menstrual phase (1.35±0.13) was greater than follicular phase (1.25±0.13). (P<0.05)

Postural index in menstrual phase (1.24±0.11) > in follicular phase (1.21±0.11) (P<0.05).

Valsalva ratio in menstrual phase (1.25±0.10) > in follicular phase (1.20±0.10) (P<0.05).

Rise in systolic blood pressure due to SHG in menstrual phase (3.33±1.32) > in follicular phase (2.3±1.36) (P<0.05). Rise in diastolic blood pressure due to SHG in menstrual phase (2.73±1.11) > in follicular phase (1.6±0.93) (P<0.05). Rise in systolic blood pressure due to CPT in menstrual phase (3.1±1.12) > in follicular phase (2.66±1.53) (P<0.05). Rise in diastolic blood pressure due to CPT in
menstrual phase (2.33±1.44) > in follicular phase (1.76±1.01) (P<0.05).

**CONCLUSION**: Results show increased values during menstrual phase as compared to follicular phase. This shows increased cardiovascular responses to stress during menstrual phase as compared to follicular phase. This is probably due to increased sympathetic activity during menstrual phase as compared to follicular phase.

**EN16PP**

**ASSOCIATION OF BODY COMPOSITION WITH TYPE II DIABETES IN MANIPUR**.

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**OBJECTIVES**: To find an association between body fat % with HbAlc%, Body mass index (BMI) and duration of treatment in type II diabetes mellitus.

**METHODS**: A preliminary study was conducted in Department of Physiology, RIMS, Imphal on 50 type II diabetic patients. Body fat % and body mass index was measured by using Omron body fat monitor (HBF 306). Glycated hemoglobin (HbAlc) was measured by using High performance liquid chromatography. Statistical analysis was done using Student ‘t’ test and Pearson correlation.

**RESULTS**: The mean age of the patients was 55.37 ± 11.07 years. The mean body fat % was 31.59±6.93, mean HbAlc was 7.64±1.82, mean BMI was 25.5±3.41 and mean duration of treatment was 7.18±6.59. The correlation of fat % and HbAlc (r=0.13), duration and HbAlc (r=0.19), body fat % and duration (r=0.24), BMI and body fat % (r=0.64).

**CONCLUSION**: The study showed no significant association between body fat% with HbAlc% and duration of treatment but significant association between body fat% and BMI.

**EN17PP**

**CARDIOPROTECTIVE ROLE OF ALOE VERA IN DIABETIC RABBITS.**

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**OBJECTIVES**: Diabetes is associated with increased risk of coronary artery disease. A variety of Indian herbs including *Aloe vera* have been found to possess antihyperglycemic property. To assess the role of *Aloe vera* in prevention of cardiovascular disease in alloxan induced diabetes and compared with healthy controls.

**METHODS**: The ratio of high density lipoprotein cholesterol/low density lipoprotein cholesterol (HDL-C/ LDL-C), homocysteine and ischemia modified albumin levels were estimated in healthy, diabetic and diabetic rabbits who were administered *Aloe vera* leaf gel extract for three weeks.

**RESULTS**: The HDL-C/LDL-C ratio was found to be increased while homocysteine and ischemia modified albumin decreased in diabetes as compared to controls. The results reversed with administration of *Aloe vera* in diabetic rabbits. The antioxidant property of constituents present in *Aloe vera* may be responsible for these findings.

**CONCLUSION**: *Aloe vera* supplementation in diabetics may help in prevention of cardiovascular complications.
A STUDY TO FIND OUT ASSOCIATION BETWEEN THYROID FUNCTION MEASURED BY SERUM TSH LEVEL, AND BMI IN NORMAL POPULATION.

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OBJECTIVES: The purpose of this study was to investigate the association between thyroid function and BMI in normal population.

METHODS: The study population consisted of a sample of 60 healthy young adult between the age group of 18 to 22 years of both sexes without any known Thyroid dysfunction. BMI ≥ 23.0 – 24.9 kg/m² was taken as overweight, and ≥25.0 kg/m² as obese (Asian criteria proposed by western pacific regional office of WHO). Serum TSH was estimated in a morning blood sample using Radio Immune Assay (RIA) technique.

RESULTS: Subjects were classified according to BMI into 3 groups, Group-I-BMI<23 kg/m² as normal, Group-II-BMI 23 – 24.9 kg/m² as overweight, Group-III-BMI≥25 kg/m² as obese. Mean TSH level were 2.22, 2.38 and 2.67 mIU/ml in Group I, II and III respectively. On comparing GroupI vs II the P value was insignificant, but comparing Group I vs III the T value was 2.36 and P value was <0.05.

CONCLUSION: Conclusion can be drawn that slight increase in TSH is associated with obesity. Large scale study is needed to establish the relation between obesity and Thyroid function.

NERVE CONDUCTION VELOCITY AS AN EARLY PREDICTOR OF PERIPHERAL NEUROPATHY IN TYPE 2 DIABETES MELLITUS

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OBJECTIVES: To study the nerve conduction velocity in clinically detectable and undetectable sensorimotor polyneuropathy in type 2 diabetes mellitus.

METHODS: This cross sectional study was conducted in diagnosed type 2 diabetes mellitus patients. They were divided in two groups, Group 1(n= 20) with clinically detectable and Group 2 ( n= 16) with clinically undetectable diabetic polyneuropathy. Clinical diagnosis was based on neuropathy symptom score (NSS) and Neuropathy disability score (NDS) for signs. Components of neuropathy disability score were ankle reflex , vibration perception test (tuning fork 128Hz), temperature sensation (cold sponge) and touch ( pin –prick) sensation. Nerve conduction velocity was measured using neuroperfect plus software in both upper and lower limbs. Median, Ulnar, Common peroneal and Posterior tibial nerves were selected for motor nerve conduction study and Median and Sural nerves were selected for sensory nerve conduction study.

RESULTS: The comparisons were done between nerve conduction velocities of motor and sensory nerves in clinically detectable and undetectable groups of type 2 diabetes mellitus. This study showed significant electrophysiological abnormality even in subclinical polyneuropathy. Nerve conduction velocities in lower limbs were significantly reduced even in patients of shorter duration.
with normal upper limb nerve conduction velocities.

**CONCLUSION:** Diabetic neuropathy symptom score (NSS) and Neuropathy disability score (NDS) can help in evaluation of diabetic sensorimotor polyneuropathy though nerve conduction study is more powerful test and can help in diagnosing subclinical cases of neuropathy.

HE01PP

**IRON DEFICIENCY ANEMIA AND IRON SUPPLEMENTATION IN CHILDREN.**

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**OBJECTIVES:** To study the effect of iron supplementation on various parameters in patients with iron deficiency anemia.

**METHODS:** This intervention study was done on 234 rural anemic children having only mild to moderate anemia over a period of ten months in a village population. The anemia was screened clinically and later confirmed by hematological tests as Iron Deficiency Anemia. These children were given elemental iron supplementation in therapeutic dose of 4 mg per kg per day along with folic acid. This therapy was continued for three months. The children having severe anemia, severe malnutrition and chronic diseases were excluded. The physical and laboratory parameters were compared before and after the completion of iron therapy.

**RESULTS:** There was significant difference in both the physical and laboratory parameters after the intervention. There was significantly more hemoglobin, hematocrit, total iron, gain in height, gain in weight and significantly lower iron binding capacity (p value < 0.05). The effect was maximum in children who had more anemia. The earliest response reported was sense of well being, regaining of appetite and increase in reticulocyte counts.

**CONCLUSION:** The children with iron deficiency anemia improve markedly in hematological and physical parameters with iron supplementation. The more is the degree of anemia, earlier is the response. The earlier and more marked response is seen with increasing severity of anemia.

HE02PP

**TOTAL LEUKOCYTE COUNT IN PROGNOSIS OF STROKE PATIENT.**

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**OBJECTIVES:** To study the increased leukocyte count in the prognosis of stroke patient.

**METHODS:** The total leukocyte count of 50 stroke patients has been examined with the help of hemocytometer using improved Neubaeurs slide within three days of admission of the patients. The other co-morbid conditions have been ruled out and the patient has been followed up for neurological deterioration for next 7 days. The CT scan of the patients also correlated for extent of involvement with increased leukocyte count.

**RESULTS:** Having out of the 50 patients 20 patients have increased leukocyte count have
poor neurological outcome and large area of infraction, therefore about 40% of the patient high TLC have poor outcome.

**CONCLUSION:** Elevation of peripheral WBC count observed soon after cerebral infarction reflects the degree of the inflammatory response in the acute phase and have a direct relationship with the extent of the local cerebral damage.

**HE03PP**

**A COMPARATIVE STUDY OF ABSOLUTE EOSINOPHIL COUNT WITH SPECIAL REFERENCE TO SOME SKIN DISORDERS IN THE NORTH-EASTERN REGION OF INDIA.**

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**OBJECTIVES:** To understand and compare the Absolute Eosinophil count in normal subjects and some skin disorders in the North-Eastern region of India.

**METHODS:** The study was undertaken to access the Absolute Eosinophil Count (AEC) in 20 persons as control group (Age 5-52 yrs) and 30 cases of skin disorders (Age 7-64 yrs), randomly selected in Gauhati Medical College & Hospital, Guwahati representing mixed socio-economic and ethnic groups. Samples were collected at 8 Am to avoid diurnal variation. Direct method of AEC is done using Diluting solution containing Eosin (Aquous) (200 gm/L) 10 ml + acetone 10 ml + Dist. Water 80 ml as per method of Dacie and Lewis. Indirect method of AEC was used by counting TLC and percentage of eosinophil in DLC to check accuracy. Statistical analysis was done by using student t-test for testing the significance of means at P<0.05.

**RESULTS:** The mean ± SD of AEC are 222.5 ± 120.83 (range of 50-450) and 1113.33±503.15 (range of400-2300) in Control group and some skin disorders respectively (P<0.05). There was no significant difference in between male and female cases in the both study groups P>0.05). There is significance difference in AEC in between Plain and Hill cases (P<0.05) in Control group, but there is no significance difference of AEC in some skin disorders group (P>0.05).

**CONCLUSION:** Absolute Eosinophil Count and routine investigation of blood are the preliminary steps in detecting and co-relating the clinical findings of diseases with eosinophilia.

In many instances, in spite of having eosinophilia or variation of haematological parameters, people may not have any symptoms or mild symptoms. So identification of such cases and adoption of proper intervention like dietary improvement, better hygiene, exposure to allergens, precipitating factors may play a big part in ensuring health of the society.

**HE04PP**

**UMBILICAL CORD BLOOD RETICULOCYTE COUNT IN NORMAL PREGNANCIES AND IN PREGNANCIES COMPLICATED BY PREECLAMPSIA**

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OBJECTIVES: The aim of the study was to estimate Reticulocyte count in the cord blood of healthy and Preeclamptic pregnant women and to associate this with Preeclamptic pregnancy.

METHODS: This case control study was conducted in campus of King George’s Medical University, Lucknow from August 2011 to August 2012. The study group comprised of 100 subjects of 18 to 35yrs age group. Out of 100 subjects, 60 controls (healthy pregnant women) and 40 cases (diagnosed PEc pregnant women as per ACOG guidelines) admitted in Queen Mary Hospital, KGMU were enrolled in this study. Reticulocyte count was estimated in the cord blood by using 1% brilliant cresyl blue in isotonic saline or methyl alcohol. Statistical analysis was performed using Two sample t- test with equal variances, Mann –Whitney test , chi – squared with ties and Kruskal – Wallis test.

RESULTS When comparing UCB Reticulocyte count (%), PEc group reported higher values (48.35±3.8) compared to control group (32.41±2.0) and the difference was highly significant (p = 0.0000)

CONCLUSION: We observed significantly higher reticulocytes in UCB reflecting a higher RBC production in neonates from PEc pregnancies. The rise in RBC production may be triggered to face hypoxic condition and / or an accelerated RBC damage / aging / removal. In PE , the RBC damage , by reducing the deformability of the cell , might further contribute to slow blood flow through the vasculature of placenta , which is compromised by inadequate spiral artery remodelling.

A STUDY OF THE RELATIONSHIP BETWEEN MATERNAL HEMOGLOBIN CONCENTRATION IN THIRD TRIMESTER OF PREGNANCY AND BIRTH WEIGHT OF THE BABY.

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OBJECTIVES: To study the relation between the hemoglobin concentration in third trimester of pregnancy with the birth weight of the baby.

METHODS: A prospective study was conducted among 100 pregnant women aged 18-25 years who attended Assam Medical College & Hospital, Dibrugarh for antenatal care and delivery in the period July 2012 to October 2012. Maternal Hemoglobin levels during the third trimester (32-36 weeks) were measured by Cyanmet hemoglobin method and studied in relation to birth weight of the baby. Women with twin pregnancies and those delivering infants with congenital malformations or stillborns were excluded from the study.

RESULTS: Hemoglobin concentration was closely related to the birth weight of the baby (Pearson Correlation value being 0.699). Very low maternal hemoglobin concentration (<8 g/dl) was associated with an increased risk of low birth weight (<2500 g) babies (Relative risk being 5.1) than relatively high maternal hemoglobin concentration.

CONCLUSION: Severe Anaemia during pregnancy is not only harmful for the mother but also for the baby. This study confirms the prior observations that maternal hemoglobin in third trimester of pregnancy is positively

HE05PP
correlated with the birth weight of the newborn.

**HE06PP**

**MODERATE ALCOHOL INTAKE FOR EVEN A SHORT DURATION HAS DELETERIOUS EFFECTS ON HEMATOLOGIC PROFILE IN INDIAN MEN.**

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**OBJECTIVES:** In the present study, we examined hematologic profile in a group of short-term alcoholics and age matched controls.

**METHODS:** We recruited thirty young (20-40 years) men with history of daily 2 to 3 units of alcohol intake for the past 1 to 3 years duration. Another thirty age matched men, who were alcohol abstainers, served as controls.

Two ml of blood was collected from anterior cubital vein after 12 hours of fasting. Hematological parameters were measured by using KX-21 Sysmex Automated Hematology Analyzer.

**RESULTS:** We observed that the MCV value was significantly higher and platelet count was significantly lower in the moderate drinkers as compared to controls.

**CONCLUSION:** Moderate alcohol intake for even a short duration has deleterious effects on hematologic profile in Indian men.

**HE07PP**

**A COMPARATIVE STUDY ON THE DISTRIBUTION OF ABO AND Rh BLOOD GROUPS IN HYPTERTENSIVE INDIVIDUALS AND IN NORMAL HEALTHY POPULATION**

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**OBJECTIVES:** 1) To study the distribution of ABO and Rh blood groups in hypertensive individuals. 2) To compare the distribution of ABO and Rh blood groups in hypertensive individuals with that of normal healthy individuals.

**METHODS:** This hospital-based comparative study consisted of a control group of 690 apparently healthy normal individuals and a study group of 132 hypertensive individuals. The blood group was determined by palpatory and auscultatory method using a mercury sphygmomanometer. The blood group was determined by slide haemagglutination technique.

**RESULTS:** Among the 690 controls, distribution pattern of ABO blood group was: O 237 (34.3%) >B 202(29.3%)>A 177(25.6%) >AB 74 (10.7%). Whereas distribution pattern of ABO blood group among the 132 hypertensive individuals was:O 57(43.2%)>A 39(29.5%)>B 30 (22.7%) >AB 6(4.5%).The test was statistically significant(p<0.05).The distribution of Rh group among the controls
was: Rh+ 674(97.7%) > Rh- 16(2.3%). Whereas distribution of Rh group among the hypertensives was: Rh+ 126(95.5%) > Rh- 6(4.5%). The test was statistically nonsignificant (p > 0.05).

**CONCLUSION:** This test showed that among the hypertensive individuals prevalence of blood group A increased by 4% whereas prevalence of blood group B decreased by 7%. Since the test was statistically significant, the ABO blood groups might have a role to play in the occurrence of hypertension. This study is consistent with earlier studies on the influence of blood groups on hypertension. But as blood pressure is multifactorial, further studies are needed to be carried out to corroborate this finding.

**HE08PP**

**STUDY OF TOTAL LEUKOCYTE COUNT DURING MENSTRUAL CYCLE IN 1ST MBBS STUDENTS, RIMS.**

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**OBJECTIVES:** To study the Total leukocyte count and to find out any cyclical variations in different phases of menstrual cycle in 1st MBBS students of RIMS.

**METHODS:** The study was conducted in Department of Physiology, RIMS. 19 apparently healthy students of 1st MBBS aged between 18-25 yrs were studied. Three blood samples of 1ml each were collected in an EDTA vial. First sample was collected within 48hrs of the onset of menstruation, 2nd sample during 8th to 10th day (proliferative phase) and third sample during 22nd-24th day (secretory phase) of menstrual cycle. The count was made under Compound microscope in an Improved Neubauer’s counting chamber using Turk’s fluid. Statistical analysis was done using one way ANOVA.

**RESULTS:** In 3 phases of menstrual cycle the mean value of Total Leukocyte Count was found to be 8810.5±58.3 (during menstruation), 8647±57.98 (during proliferative phase) and 8947.4±57.98 (during secretory phase).

**CONCLUSION:** Above results show that the Total leukocyte count was increased in secretory phase as compared to other two phases although the increase was not statistically significant.

**HE09PP**

**PURE TONE AUDIOMETRY IN IRON DEFICIENT ANAEMIC CHILDREN.**

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**OBJECTIVES:** To study the effect of iron deficiency Anaemia on pure tone audiology in children aged 5-12 yrs.

**METHODS:** 50 Anaemic children having Hb<12gm/dl were taken as cases and 30 healthy children were taken as controls. Anaemics were further divided in mild, moderate and severe anaemics. Recording was done by RMS Audiometry Platform version 1.0.0.390. The statistical significance of difference between groups was evaluated using unpaired student’s t test.

**RESULTS:** The hearing threshold values were
more in all anaemic groups as compared to controls for both air and bone conduction but values were not statistically significant except at some higher frequencies. In left ear, significant change (P<0.05) was observed in air conduction values at 500 and 4k Hz while in right ear, significant changes were observed in air conduction value at 2k Hz and bone conduction value at 4k Hz while in right ear, significant changes were observed in air conduction value at 2k Hz and bone conduction value at 4k Hz.

**CONCLUSION:** The results of the present study didn't support any significant hearing loss due to iron deficiency Anaemia.

**HE10PP**

**EFFECT OF HIGH BODY MASS INDEX ON HEMOGLOBIN LEVELS IN ADOLESCENT GIRLS.**

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**OBJECTIVES:** There is increased prevalence of anemia in adolescent females. Obesity is also common at this age due to inadequate and inappropriate dietary habits. Though there is awareness and accessibility to healthy food prevalence of anemia is common at this age.

**METHODS:** The present study was conducted in department of Physiology, GMC, Nagpur. Undergraduate girls between 17-19 years were selected for the study.

After informed consent, Age, Height and Weight were recorded. BMI was calculated. According to the International Obesity Task Force (IOTF), they were categorized into two groups. Group I (n=50) having overweight and obese girls with BMI >23, was considered as study group. Group II (n=50) having girls with BMI between 18.5-23 was considered as control group. Hemoglobin was done with Sahali's method using standard procedure protocol. According to the WHO grading, girls with HB <12gm/dl were considered anemic.

**Statistical analysis:** Student's t test was applied for the statistical analysis. Correlation was done using Pearson's correlation.

**RESULTS:** The difference in two groups was found to be significant (p <0.05). Hemoglobin levels in girls with high BMI i.e. >23 were found to be decreased compared to the hemoglobin levels in girls with BMI between 18.5 -23.

**CONCLUSION:** Low food intake, increased tendency to loose weight combined with menstrual loses causes girls to be more prone to anemia. Obesity may be related to the reduction in levels of estrogen binding protein. There is concomitant increase in insulin with increased obesity. Free estrogen may cause suppression of erythropoiesis, this may be a reason of low hemoglobin in overweight and obese females as compared to females with normal BMI.

**HE11PP**

**DISTRIBUTION OF ABO AND Rh BLOOD GROUP SYSTEMS AMONG MEDICAL STUDENTS.**

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**OBJECTIVES:** To determine frequency distribution of ABO and Rh blood groups as
well as to determine the trend of prevalence of blood groups among medical students.

**METHODS:** A total of 524 medical students of KIMS, Hubli, aged 18-20 years were selected for the study. Blood samples were collected by capillary method. The ABO and Rhesus blood group typing were done using the tile methods. Blood groups were determined on the basis of haemagglutination.

**RESULTS:** Statistical analysis was done using Chi-square test to determine statistical significance at p value of < 0.05. Among 524, 359 were males and 165 were female medical students. The distribution of ABO blood group follows following pattern: O=34.92%, B=27.86%, A = 25.19%, and AB=12.02%. There is no significant relationship between male and female students in their blood group. (Chi-square value=0.6 and P-value=0.8964). Like in many other studies, blood group O has been found to be the most common blood group. The distribution of ABO associated with Rh positivity and negativity is: O+ve=32.82%, B+ve=25.95%, A+ve=24.42%, AB+ve=11.64% and O-ve=2.09%, B-ve=1.90%, A-ve=0.76%, AB-ve=0.38%. Here also blood group O +ve and O -ve have been found to be the most common among KIMS Medical students. The trend of prevalence of ABO and Rh groups among all medical students is :O > B > A > AB. Among male students- O > B > A > AB. Among female students - O> B > A > AB.

**CONCLUSION:** Among our medical students, O +ve and O -ve are most common and AB+ve and AB -ve are least common. The trends of prevalence of blood groups is same among total students, as well as among both male and female medical students.

**EFFECT OF EXAMINATION STRESS ON BLOOD CELL COUNT IN MEDICAL STUDENTS.**

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**OBJECTIVE:** To determine the effect of examination stress on blood cell count in Medical Students.

**METHODS:** A randomized selection of first year medical students of either sex from Santosh Medical College, Ghaziabad, was carried out. After preliminary medical checkup, 45 students were selected for study and blood samples were taken before and during exams. Students having high temperature, high/low blood pressure, moderate to severe level depression, anxiety and stress (calculated in DASS-42 questionnaire software) at the start of study were excluded. Estimations of red blood cells, TLC, hematocrit, neutrophils, lymphocytes, eosinophils, monocytes, basophils and platelets were carried out.

**RESULTS:** Compared with pre-examination RESULTS of the blood samples taken during exams showed a significant decrease in monocyte (p<0.05), eosinophil (p<0.001), lymphocyte (p<0.001) and basophil (p<0.01) count. An increase in platelet (p<0.001) and neutrophil (p<0.001) count was also observed. In red blood cell category no significant changes were observed and the hematocrit was also not disturbed.

**CONCLUSION** – The stress of examinations in our college students was significant enough to produce changes in white blood cell categories which include increase in neutrophil count, while eosinophil, monocyte...
basophil and lymphocyte count decreased in number.

**HE13PP**

**A STUDY ON THE ASSOCIATION BETWEEN ABO BLOOD GROUP AND PATIENTS WITH PREGNANCY INDUCED HYPERTENSION AND ITS VARIATION WITH SEVERITY**

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**OBJECTIVES:** To know the relation between pregnancy induced hypertension and maternal ABO blood groups and its variation with severity.

**METHODS:** The study included 160 cases of PIH which were selected from ANC, labour room and indoor patients of O&G department of AMCH, Dibrugarh. The blood samples were collected by finger prick with sterile lancet after cleaning the puncture site with 70% ethanol alcohol. A drop of monoclonal anti-A, anti-B, anti-D was added to drops of blood on clean slide and mixed well. Results of agglutination were recorded immediately for ABO and after 2 mins for Rh blood group.

**RESULTS:** Out of 160 cases – {AB no=78 (48.75%), O no=46 (28.75%), A no=14 (8.75%), B no=22 (13.75%)}. According to severity of PIH - out of 160 cases, gestation PIH were 37 out of which AB no=12 (32.43%), O no=18 (48.65), A no=4 (10.8), B no=3 (8.102). Mild PIH were 56 out of which AB no=30 (53.57%), O no=8 (14.29), A no=8 (14.29), B no=10 (17.86). Severe PIH were 67, out of which AB no=27 (52.94%), O no=16 (31.37%), A no=1 (1.96%), B no=7 (13.7%). Eclampsia were 16, out of which AB no=9 (56.25%), O no=4 (25%), A no=1 (6.25%), B no=2 (12.5)

**CONCLUSION:** Our results confirm the prior observation of blood group AB being a risk factor of PIH. In the present study it is seen that AB blood group is associated with severe PIH and eclampsia.

**ME02PP**

**PUZZLE BASED LEARNING TOOL IN MEDICAL EDUCATION**

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**OBJECTIVES:** To determine usefulness and effectiveness of crossword as a puzzle based learning tool in first year medical students.

**METHODS:** Study was carried out on 42 students of 1st MBBS during practical session of experimental physiology. In crossword there were total 16 questions (8 questions across and 8 questions down) of experimental physiology. Time given was 20 min. Feedback was taken from students by simple survey in form of yes/no regarding effectiveness and usefulness of crossword. There were total 8 questions in feedback form.

**RESULTS:** Majority of students 88% (37 out of 42) were in favour of study with regard to coverage of key area of topic, contribution in overall learning, competitive aspect and good interactive teaching tool. Only few students 7% (3 out of 42) were not in favour of study
and 5% students (2 out of 42) did not give any response in feedback form.

**CONCLUSION:** The crossword puzzle was very well appreciated by students. The rational use of crosswords was useful to transfer of content, provide an opportunity to discuss and recall essential concepts, think critically and collaborate students in undergraduate studies. To make medical education more fascinating and interactive, future development of a computer based interactive facility for teachers and students using compound crossword puzzles is suggested.

**Key words:** Crossword puzzle; Medical education; Learning tool; Student.

**ME03PP**

**COMPARISON OF TEACHING AIDS IN 1ST YEAR M.B.B.S STUDENTS – STUDENTS’ PERSPECTIVE**

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**OBJECTIVES:** To assess students’ perceptions of the impact of teaching aids - Chalk and Talk, Power point presentation (PPT), Transparent Overhead Projector (TOHP), Digital Class and Animation Based Lecture and analysis of their preferences for teaching aids.

**METHODS:** A structured questionnaire containing 5(five) sets of 10 questions each was framed. Each set represented a specific mode of teaching. 70 students enrolled in 1st year M.B.B.S of Regional Institute of Medical Sciences, Imphal were taken as study group. They were instructed to fill up the questionnaire and then rank the questions on a five-point scale, namely; agree strongly (+2), agree (+1), no opinion (0), disagree (-1), disagree strongly (-2). The results were analysed using ANOVA: Single Factor test to see their preferences for the different modes of teaching.

**RESULTS:** Majority of students preferred PPT (30.63%) followed by Animation Based Lecture (23.27%), Digital class (19.91%), Chalk and Talk (14.44%) & TOHP (11.75%). Comments of the students were also recorded which could be valuable for medical teachers.

**CONCLUSION:** The students preferred the use of PPT presentations but the study does not bring out evidence based superiority of any lecture delivery methods. It appears that in the hands of a trained teacher any teaching aid would be appropriate and effective.

**ME04PP**

**TO EVALUATE EFFECT OF COMMON SOURCES OF STRESS ON ACADEMIC PERFORMANCE IN MEDICAL STUDENTS.**

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**BACKGROUND:** Stress is a universal phenomenon that can have both the effects on an individual’s productivity- increase it (‘eustress’) or decrease it (‘distress’). It is widely acknowledged that the medical fraternity is predisposed to enormous stress. The same may be true for the budding medicos - the undergraduate medical students. Our study is an attempt to identify such situations and their effects on academic
performance and to suggest certain coping mechanisms.

**OBJECTIVES:** To study-

2. Relationship between stress and academic performance.

**METHODS:** A survey questionnaire was administered on 100 medical undergraduates to assess the common sources of stress and the level of stress. The results were compared and correlated with various variables like attendance, demographic factors, average marks etc. Pearson correlation coefficient was used for statistical correlation amongst different variables.

**CONCLUSION:** Stress shows beneficial effects in females when compared to males. High attendance and better day to day performance in female medical students was associated with more amount of stress when compared to male students.

**ME06PP**

**EFFECT OF COUNSELING ON ACADEMIC PERFORMANCE OF FIRST YEAR MBBS STUDENTS**

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**OBJECTIVES:** To evaluate effect of counseling on academic performance of first year MBBS students.

**METHODS:** Present study was conducted on 1st year MBBS students (n=134) in department of physiology. All students were counseled in groups of 3 to 4 by faculty of the department. Session was aimed to know difficulties faced by students in studies, motivating and counseling them as to bring suitable changes in study methodology, learning etc. Counseling sessions were repeated for students who scored below 35% prior to counseling. Students who were not counseled were taken as control (n=121).

**RESULTS:** Parameters analyzed were mean marks obtained; mean difference of marks pre and post counseling. Students were grouped into 3 subgroups as those scoring less than 35%, between 35 to 50% and more than 50% marks (subgroup A, B, and C respectively). Inter and intra group comparison of number of students in each subgroup and their performance was done. Study group showed highly significant enhanced performance post counseling as compared to control.

In study group, improvement was observed in marks obtained (19.89±7.674 and 28.38±6.926, p < 0.0001), increased number of students in Subgroup C (from 39 to 99, p < 0.001), decreased number in Subgroup A (from 49 to 8, p < 0.001). Post counseling improvement was significantly greater in Subgroup A as compared to Subgroup B and C.

**CONCLUSION:** Our study stresses importance of counseling for 1st year MBBS students especially for the poor scorers and need for standardized counseling sessions and imparting counseling skills in faculty.

**ME07PP**

**COMPARATIVE EVALUATION OF FIRST YEAR MBBS STUDENTS BETWEEN ONE**
SYSTEM V/S TWO SYSTEM TEACHING IN PHYSIOLOGY.

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BACKGROUND: Traditionally the teaching which is followed in medical college for first year Physiology teaching is two systems being taught simultaneously.

OBJECTIVES: To experiment with an innovative method of tackling one system at a time with multiple teachers and comparing the marks obtained in the first mid term exams with marks obtained at the end of first term when the two system approach was restarted after the first mid term. The first mid term marks were also compared with second and third mid term which were held with the course covered in the two system approach.

METHODS: 121 students were taught one system at a time and evaluated (first mid term exam). Thereafter just before the second mid term exam, the two system teaching was started and continued till the end of the session.

RESULTS: There was a statistically significant difference between marks obtained in first mid term v/s third mid term as well as first midterm (theory) v/s first term theory, first mid term v/s second mid term (p<0.05). However there was no difference seen between second v/s third mid term.

CONCLUSION: Our study showed that inspite of students newly joining medical college and having adjustment problems, they performed much better in one system teaching v/s two system in physiology which is the usual pattern of teaching.

MT01PP

EFFECTS OF SHORT-TERM MODERATE ALCOHOL INTAKE ON SERUM LIPID PROFILE IN INDIAN MEN: A CROSS SECTIONAL STUDY

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BACKGROUND: It is well known that, long-term alcohol abuse has no favorable effects on lipid profile, but whether short-term, daily, moderate alcohol intake alters lipid profile or not has not been established. This objective is taken and considered as the basis for the present study.

OBJECTIVES: In the present study, we examined lipid profile in a group of short-term alcoholics and age matched controls.

METHODS: We recruited thirty young (20-40 years) men with history of daily 2 to 3 units of alcohol intake for the past 1 to 3 years duration. They were non-smokers and non-obese. They were not having any nutritional deficiency or any pre-existing cardiopulmonary or hepatobiliary disorders.
Another thirty age matched men, who were alcohol abstainers, served as controls. Two ml of blood was collected after 12 hours of fasting. Serum lipid profile was estimated by Random Access Clinical Chemistry Analyzer ERBA-XL-300.

Statistics: Data were presented as means ± SD, and analysed using the one tailed unpaired (equal variance) 't' test. The level of significance was taken at $P$ values < 0.05.

RESULTS: Lipid profile parameters like Total Cholesterol, Hdl-C, Vldl-C & Triglycerides were significantly higher; and LDL-C level was significantly lower in the moderate alcohol drinkers as compared to controls.

CONCLUSION: this study concludes that, moderate alcohol intake for even 1 to 3 years duration, significantly affect lipid profile in alcoholics.

Key words: Lipid Profile; Alcohol; Moderate; Short-term

MT02PP

SERUM URIC ACID LEVEL, BODY MASS INDEX & WAIST HIP RATIO: RELATIONSHIPS IN POPULATION STUDY.

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OBJECTIVES: To study the relationship (if any) of serum uric acid level with body mass index and waist hip ratio among individuals of 30-50 years, of both sexes.

METHODS: One hundred adult male and female individuals aged 30-50 years were selected by simple random sampling from our community health clinic near R.G. Kar Medical College & Hospital, Kolkata. The subjects were apparently healthy or had no clinical conditions known to affect carbohydrate, protein, lipid metabolism and other body compositions. Fasting blood samples were collected for serum uric acid estimation (Uricase method) and anthropometric measurements which include weight, height, and waist hip circumference were performed. Body mass index (BMI) was calculated as body weight (kg) divided by height squared (m²). Data interpretation was done by using SPSS version 17. p <0.05 was taken as statistically significant.

RESULTS: A significant (p<0.05) increase of serum uric acid (SUA) level was observed among individuals of BMI >25 (SUA=5.54±.98) & BMI< 25 (SUA =4.14±.82). Further analysis showed a strong positive correlation (r=>0.5) between SUA and BMI. While considering waist hip ratio (WHR) male individuals having WHR >1 showed significantly (p<0.05) higher level of SUA (SUA=5.9±0.2) than those with WHR <1 (SUA=4.28±.98).Similarly in females of WHR>0.85 showed a significantly higher (p<0.05) level of SUA than those compared with WHR <0.85.A positive correlation (r=>0.5) also exists between SUA level and WHR.

CONCLUSION: A graded increase of serum uric acid was observed with increased body mass index and waist hip ratio. Further study will be required to determine the physiological basis of this phenomenon.

MT03PP

CORRELATION OF CULTURAL INFLUENCE AND NUTRITIONAL STATUS AMONG SCHOOL CHILDREN
BACKGROUND: Culture plays an important role in human societies. Every culture has its own customs which have a very significant effect on health. Similarly in India too have its cultural influence which affects nutritional status among children, which may lead to over nutrition in boys whereas under nutrition in girls or vice versa.

OBJECTIVES: Gender bias and other cultural influences on food intake and its subsequent effects on growth and illness were assessed using data from school children in class 5th & 6th of Zilla Parishad school, Miraj.

1) To assess whether cultural influence affects nutrition
2) To determine whether gender bias leads to under nutrition or over nutrition

METHODS: A cross sectional study of 300 class 5th & 6th students was done. Study was conducted during the month of August. They were given a questionnaire and their clinical and anthropometric assessment was done. BMI was compared.

RESULTS: Among 300 students that were analyzed, 100 were females and 200 were males. 40% male & 32% were below 50 percentile for their age. Among non-vegetarians there 67% males & 25% females were below 50 percentile. That compared vegetarians 55% males and 57% females were below 50 percentile. Among large family 64% were below 50 percentile. Compared to 35% in small families. 80% girls said that are treated equally.

CONCLUSION: In present study, it's been seen that cultural influences doesn't affect much. But large family size affects nutrition in children. Also indicates changing trends that girls been treated equally.

MT04PP

ASSESSMENT OF RELATION BETWEEN NUTRITIONAL STATUS AND PSYCHOLOGICAL WELL-BEING OF GERIATRIC POPULATION

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BACKGROUND: Quality of life (QOL) is a multidimensional concept. Psychological well-being (PWB) is one of the main dimensions of the quality of life (QOL). This dimension is not much used in nutritional studies. The aim of the present study is to assess the relationship between the nutritional statuses of 200 residents of various areas in Meerut District.

METHODS: In this cross-sectional study, Mini Nutritional Assessment (MNA) and a Psychological well-being (PWB) Scale were used in assessing the geriatric population of Meerut district. Six dimensions of Psychological Well-being were included in this PWB scale.

RESULTS AND CONCLUSION: It is hypothesized that with malnutrition, there should be low Psychological Well-being indicating decreased QOL; while elderly persons with good nutritional status should be having high Psychological Well-being indicating increased QOL.

Key Words: Quality of life - Psychological
well-being - nutritional status- Mini Nutritional Assessment.

**MT05PP**

**ASSOCIATION OF DIETARY DESI GHEE WITH PREVALENCE OF CORONARY ARTERY DISEASE IN LOCAL POPULATION OF RAJASTHAN.**

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**OBJECTIVES:** To determine the association between intake of dietary fat (desi ghee/butter), and prevalence of coronary heart disease and its risk factors.

**METHODS:** Random cross-sectional survey was done, 200 persons (100 males and females) consuming desi ghee/butter, but having no other CHD precipitating factor were selected and subdivided into three groups one was consuming oil predominantly, one group was consuming mixed fats both oil & ghee, and third one using predominantly ghee. Subjects were further divided according to age, sex and the period since when they were consuming desi ghee/butter. Their Lipid profile was estimated.

**RESULTS:** The study shows there is a proportionately linear relation between amount of Desi ghee/butter Consumption and beneficial changes occurring in the lipid profile in both sexes. Highly significant gradual reduction in “LDL” fractions and rise in “HDL” was observed. Irrespective of gender consuming Desi ghee/butter are less prone to CHD in comparison to those predominantly taking oils. Incidence of CHD was less in both sexes who consuming Desi ghee/butter.

**CONCLUSION:** The following conclusions were drawn: Our study Shows the decreasing trends of TG, Total Cholesterol, DL-c, VLDL-C, TC/HDL-C, and LDL-C/ HDL-C ratio whereas HDL-C increase with Ghee intake in both sexes. Incidence of CHD was less proportionately when dietary oils were replaced by desi ghee/butter thus establishes a negative correlation between Desi ghee/butter consumption and CHD. Incidence of CHD is less in females than males.

**MT06PP**

**BMI AND LIPID PROFILE IN NORTH INDIAN OBESE SUBJECTS**

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**BACKGROUND:** Rapid globalization & industrialization occurring in developing countries has resulted in considerable increase in life style related diseases. South East Asian countries have the highest burden of diabetes including India & has 33 million cases. Similarly prevalence of obesity is also rising rapidly in developing countries, including India. Obesity in Type II diabetic patients is a very common phenomenon and often termed as “Diabesity”.

**OBJECTIVES:** To see the association between BMI and lipid profile in North Indian Obese subjects.

**METHODS:** This is a case control study conducted in North India. Total 150 subjects were taken for the study in which 75 subjects
were in case group, selected on the basis of WHO diagnostic criteria and 75 healthy subjects were taken as control group. Obesity was defined as BMI ≥25 kg/m2. Waist circumference (WC) >90 cm for males and >80 cm for females was considered as an indicator of abdominal obesity. The anthropometrical measurement was done by measuring tape and weighing machine. The biochemical parameters like lipid profile was done with the help of semi-auto analyzer by using commercially available kit.

RESULTS: We observed significant increase in the Weight, BMI, WC and HC of the study group. ( p< 0.01) while no significant difference was found between the age, height and WHR of the two groups. The biochemical parameters including Total Cholesterol, Se Triglycerides, LDL and VLDL were found to be significantly increased in the study group while the Se HDL levels were significantly lower in the study group.

CONCLUSION: It is concluded that subjects having BMI >30 kg/m2, they have increased Total Cholesterol, triglycerides, LDL, VLDL and decreased HDL. Thus obesity is an indicator of coronary vascular disease, we can prevent obesity in developing and developed countries by changing life style and doing yoga.

MT07PP

ASSESSMENT OF NUTRITIONAL STATUS OF PRIMARY SCHOOL CHILDREN BASED ON ANTHROPOMETRIC MEASUREMENT : A CROSS SECTIONAL STUDY.

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OBJECTIVES: This study was conducted to assess nutritional status of primary school children based on anthropometric measurements.

METHODS : A cross sectional type of study was conducted during January 2011 to June 2011 among 750 school going children of 6-10 years age group from four different schools of Nanded district, India. Height and weight of the children were measured, and BMI was calculated. Anthropometric indices of weight for age & height for age & weight for height were used to estimate children’s nutritional status.

RESULTS: The weight, height & BMI was compared against the NCHS /WHO reference standard. The mean weight & height of boys & girls of present study was found to be lower in all age groups. Among 750 students the prevalence of underweight was 50%, stunting 40% & wasting 10%.

CONCLUSION: There is an urgent need to intensify efforts to improve the nutritional profile of children to optimize human resource development.

MT08PP

EVALUATION OF KNOWLEDGE, ATTITUDE & PRACTICE OF BALANCED DIET IN MEDICAL STUDENTS.

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OBJECTIVES: Among medical persons, not merely knowing the definition of balanced
diet serves the purpose but having full knowledge, attitude to follow it and practicing it sincerely is the need of the day. The present study was henceforth aimed to evaluate the knowledge, attitude and practice of balance diet among medical students.

METHODS: This descriptive study was carried out in BJMC, Ahmedabad. 108 medical students were enrolled and necessary information was collected followed by observation of their diet patterns for one week.

RESULTS: Only 19% students could define balanced diet. Most of them (95.37%) were not able to pen down a customised balanced diet sufficing their personal requirement. The reasons for not following balanced diet among them were lack of motivation (45.37%), lack of infrastructure or facility (44.44%), lack of knowledge (23.15%). 67.59% of them did not consume any salad throughout the week. Fat content was exceeding 30% of total energy intake in diets of 24.07 % students.

CONCLUSION: The study concludes that even medical students do not have a proper knowledge of balance diet. Almost two third of students do not bother to eat salad for fibre which is very essential. Diets consumed have very high amounts of fats which may lead to rising trends in obesity & other chronic diseases.

MT09PP

SERUM LIPID PROFILE IN PREGNANT AND NON PREGNANT WOMEN IN MARATHWADA REGION OF MAHARASHTRA

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OBJECTIVES: To evaluate changes in lipid profile in normal pregnant women.

METHODS: In this study, serum total cholesterol, triglyceride, LDL-C, VLDL-C and HDL-C were estimated in 50 healthy non pregnant women and 50 healthy pregnant women in each trimester. Lipid profile was estimated by enzymatic method. The collected data was analyzed by using SPSS software and changes in lipid profile in pregnant women were studied.

RESULTS: Lipid profiles increase during pregnancy.

CONCLUSION: Lipid profiles increase during pregnancy. As increased lipid levels in pregnancy are associated with hypertensive diseases of pregnancy and atherosclerosis, its estimation should be made as a routine investigation during antenatal care for safe mother and a safe child.

MT10PP

ASSESSMENT OF UNDERWEIGHT, OVERWEIGHT AND OBESITY AMONG STUDENTS OF ASSAM MEDICAL COLLEGE AND HOSPITAL, DIBRUGARH, ASSAM.

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OBJECTIVES: To determine prevalence of underweight, overweight and obesity, as measured by Body Mass Index (BMI) and
waist circumference among first year medical students of Assam Medical College, Dibrugarh.

**METHODS:** A cross sectional study was conducted at Assam Medical College Dibrugarh during the year 2011-2012 with 150 1st MBBS students. Overweight, obesity and underweight was estimated by measuring BMI and waist circumference. BMI ≥ 23.0 – 24.9 kg/m² was taken as overweight, and ≥ 25.0 kg/m² as Obese (Asian criteria proposed by western pacific regional office of WHO). Waist circumference using Asian cut off values for overweight and obesity were: male ≥ 78 cm and ≥90 cm; females ≥ 72cm and ≥80cm respectively.

**RESULTS:** The final sample consisted of 70 females and 80 males (age group 17 to 22 years). The prevalence of underweight, overweight and obesity was 8%, 15.33% and 16% respectively. Among boys the prevalence of underweight, overweight and obesity was 7.5%, 17.5% and 15% and that among girls was 8.57%, 12.86% and 17.14% respectively. The prevalence of obesity was highest at 21 and 22 years of age among boys and girls respectively. Prevalence of obesity in the study population, by using cut off values for waist circumference is =12% and that of overweight is =25.33% respectively.

**CONCLUSION:** Young adult medical students of Assam are at high risk of overweight and obesity, so there is a need of some awareness programs and preventive measures for prevention and treatment of obesity and to prevent it’s subsequent complications.

**OVERWEIGHT AND OBESE ADULT HEALTHY INDIVIDUALS.**

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**OBJECTIVES:** This study is being conducted to compare the body composition and fluid assessment between obese, overweight and non obese subjects with and without parental history of diabetes and hypertension.

**METHODS:** The study group comprised of 20 overweight and 20 obese volunteers aged 18-50 years, while the control group consisted of age & sex matched, 20 non obese healthy volunteers. Subjects were screened after measuring anthropometric parameters like body weight (Kg), height (cms), waist and hip circumferences (cm). Body Mass Index (BMI) (Kg/m2) and waist-hip ratio (WHR) were calculated. BIA was recorded using Bodystat Quadscan 4000 to assess fat percentage, Fat Free Mass Index (FFMI), TBW, and impedance at 50, 100 & 200 HZ. The data was analyzed by applying One Way ANOVA using the SPSS (version 11.5).

**RESULTS:** We found significant differences between the groups for BMI (P=0.000), TBW (P=0.003), ECW% (P=0.000), ICW% (P= 0.000), Fat% (P= 0.000), BFMI (P=0.000), FFMI (P=0.009). However, we observed no significant difference between the groups for BMR (P=0.09), WHR (P= 0.55), Impedance 50Hz (P= 0.15), 100 Hz (P=0.15). Family history of diabetes and hypertension was positive in 33% & 66% of the study group subjects.

**MT11PP**

**ASSESSMENT OF BODY COMPOSITION USING MULTIFREQUENCY BIOIMPEDANCE ELECTRICAL ANALYSIS IN NON-OBESE,**
**CONCLUSION:** Body composition assessment can be used to identify health risk associated with total body fat or excessive accumulation of intra-abdominal fat. Further study may be done with a bigger sample size and body composition may be assessed using a gold standard methods such as the four compartment model.

**MT12PP**

**BODY COMPOSITION MEASUREMENTS USING BIOELECTRICAL IMPEDANCE ANALYSIS IN CHILDREN.**

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**OBJECTIVES:** Body composition measurements using Bioelectrical Impedance Analysis (BIA) seems to be a convenient method to use in large epidemiological studies. Other known methods are mainly laboratory based, more complex and expensive. In our study we measured fat mass (FM), fat free mass (FFM) and total body water (TBW) in children using BIA.

**METHODS:** 61 children aged 6 to 9 years who provided informed consent and assent were recruited. Anthropometric measurements and BIA using BodyStat Quadscan 4000 were performed under standard conditions. Subjects were stratified according to their gender and age and an Independent t test was applied to determine any gender differences in body composition parameters.

**RESULTS:** The mean FM was slightly higher in boys except in the 7-8 years age group where girls were 14.52 ± 2.49 vs 14.22 ± 2.49 kgs in boys. TBW also showed similar results where the girls had a higher value 11.20 ± 2.08 vs 10.96 ± 1.91 litres in boys in the 7-8 years age group. There were no statistically significant differences in all these parameters between genders.

**CONCLUSION:** Our study showed that there were no significant gender differences in body composition at various age groups in children. The nutritional status of children should be considered for further analysis. BIA is a convenient method to be employed in large field based studies, however, it needs to be validated for a specific population against a gold standard method such as the four compartment model.

**NS01PP**

**A STUDY OF CORRELATION BETWEEN BODY MASS INDEX & COGNITIVE PERFORMANCE OF UNDERGRADUATE MEDICAL STUDENTS**

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**OBJECTIVES:** Obesity is major health problem and it has effects on all the systems of the body. Hence this study is mainly done to assess the correlation between body mass index & cognitive performance in the age group of 18 – 25 years.

**METHODS:** The study was carried out on 230 volunteer students in tertiary care hospital. Body mass index was calculated by quetlet’s formula. Pretest instructions were given & then cognitive performance was assessed by using “Montreal Cognition Assessment Test”.a
10 minutes : 30 points test which is used in assessing a wide range of cognitive abilities based on 7 domains - Visuospatial / Executive Skills, Naming, Memory, Attention, Language, Abstraction ,Orientation & total scoring was done.

**RESULTS:** Statistical analysis was done by using ‘Spearman’s correlation test’. It showed Negative correlation between body mass index & cognitive performance total score \( (r = -0.647) \) \( (p = 0.000) \) which is statistically significant.

**CONCLUSION:** In this study correlation between body mass index & cognitive performance was found.

**NS02PP**

**ANTHROPOMETRY AND COGNITIVE ABILITY IN THE YOUNG**

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**OBJECTIVES:** To study the relationship between anthropometric factors and cognitive abilities

**METHODS:** 18 young, and apparently healthy, students in their first year of university were enrolled into the study. Anthropometric measurements were noted: height, weight and waist –hip ratio. Waist measurements were taken at the midpoint of the lowest rib and top of the iliac crest (WHO steps protocol). Hip measurements were taken at the widest portion of the buttocks (WHO guidelines), and waist-hip ratio was calculated. The subjects underwent cognitive testing under 4 categories: memory, planning, reasoning and concentration using a cognitive test pre-validated at the Medical Research Council Cognition and Brain Sciences Unit (by A.H. and A.M.O). A non-parametric test for correlation (Spearman’s) was conducted to find any correlation between anthropometric factors (weight, height, waist circumference, hip circumference, BMI and waist/hip ratio) and performance on the cognitive tests.

**RESULTS:** Performance on the grammatical reasoning task was negatively correlated to all anthropometric measurements except for waist –hip ratio. No correlation between test performance and anthropometric factors was found for the other tests

**CONCLUSION:** “Grammatical Reasoning ability” was found to decrease with an increase in weight, height, waist circumference, hip circumference and BMI, however waist hip ratio did not affect performance on the cognitive test. Weight showed the most significant correlation. So far, the sample size in this study is small and currently more data is being collected which may give us more information.

**NS03PP**

**SEASONAL, AGE & GENDER VARIATION OF GUILLAIN BARRE SYNDROME IN A TERTIARY HEALTH CENTER IN INDIA.**

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**OBJECTIVES:** Seasonal & gender preponderance have not been adequately studied in Guillain Barre Syndrome (GBS). We conducted a prospective study to investigate differences in GBS incidence between males
and females across different seasons of the year.

**METHODS:** 65 clinically diagnosed patients of GBS, in the age range 5-70 years, were referred to our department from the department of Medicine for nerve conduction, F-wave & EMG studies from 2010 to 2012.

**RESULTS:** Of the 65 patients, 42 (64.61%) were males while 23 were females (35.38%). 30 patients were in the age group 5-20 years (46.15%), 18 (27.69%) in 21-40 years, 11 (16.92%) in 41-60 years while only 6 (9.23%) patients were aged above 60 years. The highest incidence of 40 patients (61.53%) was seen in the warmer months of the year from April to September while there were 25 (41.66%) cases in the cooler months from October to March. 15 patients (23.07%) had diarrhoea while 10 (15.38%) patients had flu like syndrome a week before the onset of GBS. Rest of the patients had sudden onset of weakness.

**CONCLUSION:** Our study showed male preponderance with the child to adolescent age group being more affected. The disease occurred throughout the year but small peaks of higher incidence are found in different parts of the year particularly in warmer months. The seasonal clustering noted by us may be related to peaks of GI infection in summers & respiratory infections in winters.

**NS04PP**

**TO STUDY THE EFFECTS OF LOCALIZED COLD OF DOMINANT ARM ON REACTION TIME IN YOUNG MALES AND FEMALES.**

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**OBJECTIVES:** To study the effects of localized cold of dominant arm on reaction time in young males and females. In this study visual reaction time is studied before & after immersion of arm in cold water & compare the readings in males and females.

**METHODS:** Study was carried out on 80 healthy students in age group 18-22 years from first year of Seth G. S. Medical College & K.E.M. Hospital, Mumbai of which 40 are males & 40 are females. With proper consent, the visual reaction time is measured by using green light before immersion of arm in cold water, then same test is performed after Immersion of arm in cold water in both males and females.

**RESULTS:** Statistical analysis showed significant increase in visual reaction time for green light after immersion of arm in cold water in both sexes.

**CONCLUSION:** The local effect of cold temperature significantly prolonged the reaction time & this mainly affected the performance of individual.

**NS05PP**

**REACTION TIME IN TELEVISION WATCHING SCHOOL CHILDREN.**

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**OBJECTIVES:** Study was done to find out whether Auditory and Visual reaction time (ART, VRT) is affected in school children who watch television (TV) daily.

**METHODS:** 56 school children of both gender aged between 10-14 years were included and
informed consent was obtained. Children watching TV for less than 1 hour per day were taken as controls and those watching for more than 2 hours per day were included in study group. Daily hours of physical activity, academic performance were enquired. ART and VRT was measured using Portable Reaction Time Response Apparatus supplied by Inco Instrumentation.

**RESULTS:** Student t test was applied for two groups to find out significant difference. VRT was significant with p value = 0.0084 in both girls and boys. Hours of daily TV watching was significant with p value= 0.000 in both girls and boys. Academic performance and physical activity was significant for boys with p value= 0.033 and 0.004.

**CONCLUSION:** VRT was prolonged in children watching TV for more than 2 hours. TV watching causes memory and concentration problems leading to decreased academic performance, replaces activities like sports, outdoor games which are essential for growing children.

**NS06PP**

**EFFECT OF SHORT TRANSCENDENTAL MEDITATION ON EEG PATTERN, PULSE RATE AND BLOOD PRESSURE OF MEDICAL STUDENTS.**

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**OBJECTIVES:** We evaluated the effects of short transcendental meditation lasting ten minutes in untrained subjects. The changes in electroencephalogram (EEG), pulse rate (PR) and blood pressure (BP) were evaluated.

**METHODS:** EEG was taken after 5 minutes rest, during, and after 10 minutes of meditation with “aum” chanting in 20 medical students. BP and PR were recorded after 5 minutes rest, and after meditation.

**RESULTS:** The mean resting EEG was 35 Hz (range 32 – 45 Hz; SD 3.9). During meditation, alpha waves were seen in 6 (30%) subjects, the rest had beta waves. The mean EEG during and after meditation were 24 Hz (range 8 – 35 Hz; SD 11.8) and 25 Hz (range 8 – 35 Hz; SD 11.2) respectively. The mean PR before and after meditation were 83/min (range 70 – 96; SD 6.9) and 74/min (range 68 – 88; SD 5.1) respectively, and the change was significant (p=0.03). There was a significant drop in both systolic BP (p=0.001) and diastolic BP (p=0.002) following meditation. Mean systolic BP before and after meditation were 118 mm Hg (range 106 – 130; SD 7.2) and 110 mmHg (range 100 – 122; SD 6.2) respectively, and mean diastolic BP before and after meditation were 72 mm Hg (range 60 – 82; SD 5.5) and 66 mmHg (range 60 - 74; SD 3.9) respectively.

**CONCLUSION:** A significant reduction in pulse rate and blood pressure can be achieved with short transcendental meditation. Alpha waves consistent with meditative state could be achieved in 30% of the subjects.

**NS08PP**

**ASSESSMENT OF DISABILITY IN PATIENTS OF RHEUMATOID ARTHRITIS USING STANFORD HEALTH ASSESSMENT QUESTIONNAIRE (2PAGE HAQ).**

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OBJECTIVES: Rheumatoid arthritis is a disabling condition and now-a-days the therapy offered to the patients is directed towards improving their overall health status.

The aim of this study is to obtain data regarding various domains involving day to day activities and pain, using Stanford Health Assessment Questionnaire- Disability Index (2 page HAQ) from cases of Rheumatoid Arthritis.

1. To derive scores from the data obtained.
2. To interpret the scores obtained as a measure of disability.

METHODS: 30 Cases of rheumatoid arthritis were selected according to the inclusion / exclusion criteria. Their age was 42.6 ± 5.4 years and their disease duration is 8.5 ± 4.5 months (expressed as mean ± SD). They were assessed using The Stanford Health Assessment Questionnaire to obtain disability index. Baseline readings were obtained. Follow up readings will be taken according to the protocol.

RESULTS: The baseline readings for the cases are (expressed as Mean ± SD)

Health assessment questionnaire-Disability Index: 1.65 ± 0.5
Visual Analogue Scale-Pain Index: 1.71 ± 0.63
Visual Analogue Scale- Global Health Index: 1.49 ± 0.81

First follow up results are awaited.

CONCLUSION: The disability scores, pain index, global health index obtained indicate moderate disability in recently diagnosed cases of rheumatoid arthritis. These scores provide the baseline data to assess the disability trends in rheumatoid arthritis. The follow up results will help in assessing the prognosis and measure the effectiveness of therapy instituted.

NS09PP

COMPARISON OF THE MEDIAN NERVE MOTOR CONDUCTION VELOCITY IN THE LEFT AND RIGHT UPPER LIMBS IN NORMAL RIGHT HANDED SUBJECTS.

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OBJECTIVES: Nerve conduction study is an important tool to evaluate peripheral nerve abnormality. Nerve conduction velocity depends on factors like Age, Gender, Height, Weight and Temperature. The present study was undertaken to assess if their exists any difference in the Median nerve motor conduction velocity in the left and right upper limbs in normal right handed subjects.

METHODS: The study was conducted on 20 normal carefully screened healthy subjects in the age group of 18-21 yrs. Those with the history of Diabetes, Hypertension, Alcohol intake or any other disease likely to effect nerve conduction parameters like Limb injury, Neuropathy, Neuromuscular transmission disorder and Myopathy where excluded. The Equipment used was Allengers Scorpio EMG EP NCS system. The site of stimulation for motor median nerve was wrist and elbow and recording site was motor point of abductor pollicis brevis. Standard distance and measuring protocols were used. The room temperature was between 28º-30ºc.

RESULTS: The mean of Nerve conduction velocity in Right Limb was 65.92±3.6 while in
Left Limb it was 61.29±3.36. Our study shows that motor nerve conduction velocity was greater in right limb as compared to left limb and is statistically significant (p<0.001). 

CONCLUSION: The difference in the sizes of motor neurons of the two limbs can be the reason for the difference in the conduction velocity. The motor neurons of the spinal cord of the dominant right upper limb are more as compared to those of left.

NS10PP

PSYCHOPHYSIOLOGICAL STATUS DIFFERENCE BETWEEN HOSTELLERS AND DAY SCHOLARS OF INDIAN PROFESSIONAL SCHOOLS STUDYING IN FIRST YEAR.

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OBJECTIVES: This study has been designed to verify the hypothesis that hostellers are much more stressed as compared to day scholars studying in college.

METHODS: A random study was done on 100 students of first year of different professional schools aged between 18-21 years near Delhi-NCR and surroundings. Students are categorised into two groups, Group-A (hostellers), staying for more than six months in hostel and Group-B (day scholars), staying in their respective residences. Each group consists of fifty students. They were assessed by using well-established Hospital Anxiety and Depression Scale (HADS) and Pittsburgh Sleep Quality Index (PSQI) questionnaires to determine their anxiety, depression and sleep status respectively. Blood pressure and pulse rate were measured from each subject of both the groups. Student's T-test was performed to analyse.

RESULTS: By this experiment, it has been observed that sleep status difference are found to be significant between Group-A and Group-B (P<0.05) and more interestingly it has been observed that there are no significant difference of depression and anxiety status between Group-A and Group-B ( P > 0.05). Blood pressure and pulse rate status of the two groups were also not significant ( P > 0.05).

CONCLUSION: Our survey concludes that sleep quality is much poor among hostellers compare to day scholars. Surprisingly, it has been also observed that boys and non-vegetarians among hostellers are more prone to poor sleep quality. Poor sleep may lead to stress in near future among hosteller. Further research in more depth in this field is needed to get more inferences and their interventions.

NS11PP

RHOMBERG SIGN- A SENSITIVE INDICATOR IN CHRONIC FATIGUE SYNDROME (CFS) PATIENTS.

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OBJECTIVES: CFS first named in the 1980s is not a new disease and has been referred to by other names since the 1700s yet it remains a controversial topic because, even as diagnoses increase, many health professionals doubt if CFS really exists or is it considered as a psychological ailment. The hallmark
symptoms of CFS are overwhelming fatigue and weakness that make it extremely difficult to perform routine and daily tasks. The objectives were to find out etiology of CFS by assessing rhomberg sign in such patients, thereby supporting evidence of cerebellar pathology in such patients. To evidently prove that CFS is not a somatisation disorder but an individual disorder.

**METHODS:** It’s a cross sectional study carried out on patients who are diagnosed with CFS by neurophysicians and neurosurgeons in KEM hospital and evaluated with the Rhomberg test. Patients aged 13 to 60 were included in this study. Calculation of sample size was done according to prior pilot study, which concluded the confidence interval of 9%. By feeding the data in chi-square test statistical analysis, we obtained a sample size of 60.

**Result:** Patients with diagnosis of CFS and a positive rhomberg sign concluded that cerebellum has got a substantial role in pathophysiology of CFS. Alternative treatment regimen can be effectively planned once cerebellar pathology is evidently proved.

**CONCLUSION:** There is statistically proven association of CFS with Rhomberg test thus proving the cerebellar etiology of CFS.

**NS12PP**

**PAIN TOLERANCE IN POST PRANDIAL CONDITION.**

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**OBJECTIVES:** The amount of pain felt by a person in response to a painful stimulus depends on the nature of the stimulus and on the physical/mental state of the person at the time of the stimulus. Various techniques that enhance pain tolerance are being developed. The purpose of this study was to investigate if pain tolerance is altered in the post prandial state.

**METHODS:** The study was conducted on 64 male subjects (selected from the 108 volunteers who reported for the study). Experimental pain was produced by cold pressor task (CPT) in the fasting and half-hour post-prandial condition. 2 Milliliter blood was collected for plasma glucose estimation (by ortho-toluidine method), just before performing CPT. Statistical analysis was carried out on observations obtained from 43 subjects who satisfied the inclusion and exclusion criteria.

**RESULTS:** Pain threshold and pain tolerance increased significantly in the half-hour post-prandial condition. The decrease in pain sensitivity was not accompanied by a corresponding increase in the cardiovascular reactivity.

**CONCLUSION:** The increased blood glucose level in the half-hour post-prandial condition produces a decrease in pain sensitivity. Pain tolerance increases with increase in blood glucose, making it easier to bear pain.

**NS13PP**

**CONSANGUINITY AND CONGENITAL OCULAR DEFECTS: COINCIDENCE OR A POTENTIAL GENETIC ETIOLOGY**

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OBJECTIVES: To find out the prevalence of association of consanguinity with congenital ocular defects in a community practicing consanguinity.

METHODS: Population based cross sectional study included total 270 subjects suffering from congenital ocular defects. A detailed history was taken prior to clinical examination. The history included information regarding consanguinity of the parents from subjects chosen for the study. The history related to consanguinity included type of relationship ie cross cousin, parallel cousin or any other. Each subject underwent a detailed ocular examination including visual acuity measurements, anterior segment examinations with slit-lamp bio-microscopy, and posterior segment examination for diagnosing the type of defects.

RESULTS: Parental consanguinity was seen in 173 (64.07%) subjects while 97 (35.93) subjects with congenital ocular defects showed absence of parental consanguinity. The most common form of consanguineous marriage was amongst first cousins (cross or parallel) followed by uncle niece relationship other forms of kinship marriages were also seen. The commonly associated malformations included congenital cataract (46%), retinitis pigmentosa (17%), coloboma (15%), microcornea (7%), congenital absence of eye (anophtalmos)(3%) and other syndromes (12%).

CONCLUSION: Our study shows a high association of consanguinity with congenital ocular defects. It could be a potential genetic etiology for such defects studies Discouraging the social custom of marriages among blood relations can reduce the burden of blindness due to congenital ocular defects in the society.

NS14PP

COMPARITIVE ANALYSIS OF CONDUCTION VELOCITY OF ULNAR NERVE AROUND ELBOW JOINT IN PHYSIOLOGICALLY NORMAL SUBJECTS IN DIFFERENT AGE GROUP.

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OBJECTIVES: To study the conduction velocity of ulnar nerve across elbow joint in physiologically normal subjects of different age groups

METHODS: Motor nerve conduction velocity across elbow were performed in170 healthy human subjects of both sexes. Ambient temperature during whole of recording period was kept constant (25+_20c). Length of ulnar nerve segment across elbowed was also kept constant (100mm). The conduction studies were performed using machine Viking Quest EMG and Master copy software 48.0. The measurement of motor nerve conduction were carried out on ulnar nerve around elbow respectively

RESULTS: In the present study motor conduction velocity of ulnar nerve in different age groups was almost same. The difference between the different age group was not statistically significant

CONCLUSION: The present study is an endure to investigate the effect of aging on nerve conduction parameters of ulnar nerve across
elbow, information about which is scanty in the literature as majority of the studies have been done on median nerves. Our study on ulnar nerve shows non linear changes in nerve conduction velocity across elbow with age.

**NS15PP**

**EEG PATTERN IN DEPRESSED MEDICAL STUDENTS.**

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**OBJECTIVE:** The present study was done to study the pattern of EEG oscillations in various grades of depression.

**METHODS:** 99 1st year medical students were assessed using Beck’s Depression Inventory (BDI) for different grades of depression. 53 (53.5%) students had BDI <15, 32 (32.3%) had BDI between 15-22, 11 (11.11%) had BDI between 23-27, and 3 (3.0%) had BDI>27. These students were graded as being normal, and having mild, moderate and severe channel Neuro Page Plus, NP-3200P, Medicaid data for the various groups was analyzed using ANOVA.

**RESULTS:** The study revealed a loss of normal asymmetry pattern of α-spectrum in depressed students. The severity of asymmetry was found to increase with increase in severity of depression.  

**CONCLUSION:** The left hemisphere is supposed to respond to positive thoughts and right to negative thoughts. We have found left hemispherical hypoactivity (less of α- rhythm) which is suggests that depressed persons are less sensitive to positive stimulus.

**NS16PP**

**GENDER AND BMI BASED VARIATION IN MEMORY STATUS OF THE YOUNG ADULTS.**

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**OBJECTIVES:** With an increase of obesity and its innumerable complications, obesity has become a major public health problem. Recent works indicate that obesity is also associated with poor neurocognitive outcome and increase risk of excess age related brain atrophy making higher vulnerability for Alzheimer’s disease. Therefore aim of present study was to find out the relationship between obesity and memory status in young individuals where the possibility of effect of aging process on memory can be ruled out.

**METHODS:** This study was done on 94 healthy young adults of both sexes of 17-20 years of age. On the basis of their BMI the subjects were divided into two major groups. Group I – normal BMI group, which was further divided into Group I M- Normal BMI males and Group I F- Normal BMI Females. Group II – above normal BMI subjects which was further divided into Group II M- Above Normal BMI males and Group II F- Above Normal BMI Females.

To test memory status, a tray containing 15 familiar, different, small sized, neatly arranged articles was shown to the subjects for 90 seconds. After that 30 seconds gap was given to the subjects to settle down and then 60 seconds were given to the subjects to write those articles on a sheet of paper. This day was considered as 0 Day. On 4th day and 10th day the subjects were asked (without any
prior information) to recollect their memory and to write those articles again in a span of 90 seconds duration. Observations were taken and analysed statistically.

**RESULTS:** Overall result showed better recall of articles on each occasion by group I in comparison to group II. However statistically significant difference of recall of articles was found on 4th day (p value < 0.05) and 10th day (p value < 0.05).

Female subjects showed statistically significantly better recall than their counterparts in group I on 4th day only (p value < 0.05) and in Gp II on 4th day (p value < 0.00) as well as on 10th day (p value < 0.01).

**CONCLUSION:** Individuals having higher body mass index, more so males, should be cautious of their weight to maintain normal memory status.

**NS17PP**

**EVENT RELATED POTENTIALS IN ANEMIC SCHOOL GOING CHILDREN OF THE AGE GROUP 8-10 YEARS.**

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**OBJECTIVES:** To study the cognitive deficits in anemic children by comparing event related potentials (P300 values) of the anemic children with respect to the control children

**METHODS:** The hematological values and P300 Latency as well as the P300 amplitude of 41 anemic children were compared with 53 control children. The parametric as well as non-parametric tests were done to study the differences between the two groups.

**RESULTS:** Significant differences were observed between anemic and control groups with respect to hematological variables: Hemoglobin, hematocrit, MVC and MCH. The P300 latency of anemic group was significantly delayed with respect to the control group. However, no difference in P300 amplitude was observed.

**CONCLUSION:** The anemic children have delayed P300 latency as compared to control children. This indicates that the anemia may be associated with cognitive deficits in school going children.

**NS18PP**

**EFFECT OF VITAMIN E ON COGNITIVE PROCESSING IN PATIENTS OF DEMENTIA**

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**OBJECTIVES:** In this study we access the role of vitamin E as anti oxidants on cognition in patients of dementia.

**METHODS:** Study was conducted in 20 demented subject 66-74 years of age and 20 age matched controls. P3 latency and amplitude was recorded and analyzed

**RESULTS:** The data was analysed by using unpaired student’s t-test . P3 latency value showed an increase from 338.65 ± 42.22 msec in control group to 348.9+46.38 msec in demented patients. In control group P3 latency decreased from 338.65 ± 42.2 msec to
After vitamin E therapy, the patient of dementia latency was decreased significantly from 348.9 ± 46.38 m sec to 324.62 ± 44.25 m sec after one month. P3 amplitude in control and demented was 7.2 ± 3.6µv and 7.07±3.73µv respectively. It increased significantly to 9.34±5.04µv in control and to 9.58 ± 5.24 µv in demented patients after Vitamin E therapy.

CONCLUSION: Our study supports that Vitamin E supplementation because of its antioxidant property might be decreasing oxidative stress which may lead to improvement in cognitive pool of generator neurons of P3 component of ERPs by showing decrease in latency and increase in P300 amplitude.

NS19PP

ASTROGLIAL AND MICROGLIAL RESPONSES IN SPORADIC AMYOTROPHIC LATERAL SCLEROSIS

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OBJECTIVES: To investigate the microglial and astroglial responses to the toxic effects of cerebrospinal fluid of patients suffering from ALS.

METHODS: Primary glial cultures and pure astrocyte cultures were established from 17 days old Wistar rat embryos (E17). On 7th DIV, out of three sets of cultures, two were exposed to CSF from patients suffering from ALS (ALS-CSF), and other non-neurodegenerative diseases (NALS-CSF) respectively. After 48 hrs of exposure to CSF, the cells were fixed with 4% paraformaldehyde. Immunostaining was performed for glial markers viz. glial fibrillary acidic protein (GFAP) and Iba-1, Chitotriosidase and Vascular endothelial growth factor (VEGF).

RESULTS: Phase contrast images depicted morphological changes in the form of reactive gliosis as well as an increase in the number of microglial cells on exposure to ALS-CSF, which was confirmed by GFAP and Iba1 immunoreactivity. An increase in the number of chitotriosidase expressing glial cells was also observed in cultures exposed to ALS-CSF. Preliminary studies even indicated increased expression of trophic factor VEGF in the ALS-CSF exposed pure astrocytic cultures.

CONCLUSION: The VEGF upregulation in the ALS-CSF exposed astrocyte cultures might suggest a compensatory mechanism to combat the initial insult, post-exposure. It may however be interesting to investigate the expression of the neuronal VEGF receptors VEGFR1 and R2 to evaluate the affectivity of the up-regulation, on the degenerating neurons. Additionally, ALS-CSF induced reactive microgliosis in vitro; together with increased number of Chitotriosidase expressing cells supports the theory of accentuated neuroinflammation in ALS.

OT01PP

A COMPARISON OF SELF-ESTEEM IN MALE AND FEMALE SCHOOL AND UNIVERSITY STUDENTS

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OBJECTIVE: The aim of this study was to compare the self-esteem in male and female school and university students.

METHODS: In this study, there were two groups of participants, they were (i) thirty-six university students (18 males and 18 females), with ages between 17 and 23 years (group mean ± S.D., 19.9 ± 1.6 years; 20.5 ± 1.8 years for male students; 19.3 ± 1.1 years for female students) and (ii) ninety-six school students (48 males and 48 females), with ages between 9 and 12 years (group mean ± S.D., 10.3 ± 1.2 years; 10.5 ± 1.2 years for male students; 10.2 ± 1.1 years for female students). It was a cross-sectional study with one time assessment. For college students, The Self-Esteem Index was used to assess self-esteem and for School students, The Indian Adaptation of Battle’s Self-Esteem Inventory for Children was used. Data of male and female were compared using the t-test for unpaired data of both university and school students.

RESULTS: There was a significant difference in the self-esteem quotient between male and female of university student (p<0.05). Personal security scores of females were significantly higher when compared with personal security scores of males for the university students (p<0.01). For the school students, there was no significant difference in the total self-esteem of males and females of school students (p>0.05), but the general self-esteem of females was found to be higher than males (p<0.05).

CONCLUSION: In university students, females have higher personal security than males and in school students, females have higher general self-esteem.

OT02PP
EFFECT OF MOBILE PHONE TEXTING ON FINGER DEXTERITY AND VISUAL AND AUDITORY REACTION TIME.

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OBJECTIVES:

1. To evaluate whether frequent mobile phone texters have better finger dexterity as compared to rare texters.
2. To measure and compare auditory reaction time for low tone & high tone sound stimuli in frequent texters & rare texters.
3. To measure and compare visual reaction time for red light & green light stimuli in frequent texters & rare texters.

METHODS: The study was carried out in a tertiary care hospital of Greater Mumbai, on 100 volunteer undergraduate medical students of age group 17-19 years. Informed written consent was taken. The study group consisted of 50 students who were frequent mobile phone texters with QWERTY key pad since minimum of 4 years & control group consisted of 50 rare texters. After proper explanation of the procedure & sufficient practice trials; finger dexterity test by O’Connor dexterity test apparatus was carried out in both groups. Also the visual reaction time for red & green light stimuli as well as auditory reaction time for low & high tone sound was carried out on both groups.

RESULTS: Statistical analysis was done by Student 't' Test. Result of Finger dexterity test
among frequent texters & nontexters was statistically nonsignificant. (\(p =0.1769\)). Visual & auditory reaction time between two groups was statistically significant for all four stimuli. (\(P =0.0000\)).

CONCLUSION: Neurophysiological correlates of the effects of mobile phone texting in adolescents on finger dexterity were found non-significant. However, texting significantly showed improvement in reaction time task.

OT03PP

EFFECT OF LISTENING TO MUSIC DURING EXERCISE ON POST EXERCISE ATTENTION

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OBJECTIVES: Music enhances exertion tolerance through the diversion of attention from the exertive. Understanding effects of listening to music on neurocognitive functions has become a new area of interest. In this study we are evaluating the effects of listening to music during exercise on post exercise attention process.

METHODS: A total of ninety dental/ medical male students in the age group of 17-23 years were selected and randomly assigned into three intervention groups of 30 each. Control group were not given any exposure to music while the other two were allowed to listen to a pre-recorded Indian Classical instrumental music and Western Heavy metal rock music respectively during sub-maximal treadmill exercise (Bruce protocol for sub-maximal treadmill exercise). Post exercise attention were measured using Forward and Reverse Digit Repetition Tests as discrete scores and Trail making Test A (TMT-A) and Trail making Test B (TMT-B) as continuous variables (in seconds) in all the three groups. Statistical Analysis: Mean, Standard deviation were calculated for discrete and continuous variables using one way ANOVA and difference in the means between two groups were measured using t test for independent samples.

RESULTS: There was a significant improvement in scores of Forward and Reverse Digit Repetition tests (\(P<0.05\)) and TMT-A & TMT-B showed significant decrease in duration with less errors (\(P <0.05\)) in Indian classical instrumental group as compared with other two groups.

CONCLUSION: Listening to Indian classical instrumental music during exercise has beneficial effects on post exercise attention process.

OT04PP

DISTRIBUTION OF INTRAOCULAR PRESSURE.

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OBJECTIVES: To know Mean Intraocular pressure among different age groups

METHODS: Apparently normal subject were included in the study and instrument used was Schiotz indentation tonometer.

RESULTS: The beneficial effect of early treatment are well known so population based data will be helpful to know the population at risk. Intraocular pressure was
considered as a prime causative factor for glaucoma and recognized age as a risk factor.

Mean Intraocular pressure among individual of 21 to 30 years was 14.58 ± 2.50 mmHg which increases to 14.62 ± 2.52 mmHg among 31 to 40 years. and 15.26 ± 2.61 mmHg among 41 to 50 years. 15.73 ± 2.86 mmHg among 51 to 60 years. 15.70 ± 2.84 among 61 to 70 years and 15.27 ± 2.60 mmHg among population > 70 years.

**CONCLUSION:** The present study we found that intraocular pressure increased with age and age dependant increase is statistically significant after the age of 40 years. Glaucoma being insidious onset and the warning signal is increased Intraocular pressure. The knowledge of mean Intraocular pressure in various age groups will help glaucoma screeners.

**OT05PP**

**GASTRIC CONTRACTIONS PRODUCED BY INDIAN RED SCORPION VENOM INVOLVE 5 –HT.**

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**OBJECTIVES:** Gastric dysfunctions are commonly observed after scorpion envenomation. The mechanisms involved are not understood. Therefore, present study was performed to assess the effect of Indian red scorpion (*Mesobuthus tamulus*; MBT) venom on the contractility of fundus muscle of rat stomach and the underlying mechanisms involved.

**METHODS:** Isometric gastric fundus muscle contraction was recorded *in vitro* on a chart recorder. The muscle strip was exposed to different concentrations of serotonin (5–HT) or crude MBT venom. The contractions elicited by exposure to crude venom were expressed as the % of maximum contraction produced by 5-HT at the beginning of each experiment. The contractile responses to 1.0 µg/ml of crude venom were ascertained in absence or presence of serotonin antagonist, methysergide.

**RESULTS:** The 5-HT (0.004 – 4.0 µM) produced a concentration-dependent increase in muscle contractions and the maximum contraction was obtained at 4.0 µM. Hence, the contractions obtained at 4.0 µM of 5-HT was taken for normalization. The crude venom (0.1 – 1.0 µg/ml) also produced concentration-dependent increase in contractions. The maximum contraction was observed at 1.0 µg/ml of crude venom. In a separate series of experiments, methysergide pretreatment (1.0 µM) attenuated the contractile responses elicited by venom (1.0 µg/ml) significantly (P< 0.05) and blocked the 5-HT (4.0 µM) induced contractile responses.

**CONCLUSION:** The result indicates that the gastric fundus contractions elicited by crude Indian red scorpion venom are mediated partially involving 5-HT.

**OT06PP**

**AN AUTOMATED PERIMETRIC COMPARISON OF FIELD OF VISION IN YOUNG EMMETROPS AND MYOPTICS.**

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OBJECTIVES: Myopia or Nearsightedness is a vision condition in which the images of distant objects are focused in front of the retina. This defect is usually caused by changes in axial length and curvature of eye so it is assumed that the peripheral field of vision, operating through Retinal neural mechanisms can also be influenced(7, 8 proforma). Thus the explicit aim of present study is to compare field of vision in the young Emmetropic & Myopic eye and in view of any positive finding, even at an early age Myopia related field changes can be detected.

METHODS: The present study was carried out on equal number of Emmetropic and Myopic 30 subjects of both sexes of 22 to 30 years of age after seeking their consent and ruling out any other ocular disease. Visual field testing was performed with the Humphery Visual Field analyzer using ‘60-4’ test. Data collected was subjected to standard statistical analysis.

RESULTS: Results are under computation and will be discussed at the time of presentation.

CONCLUSION: Conclusion will be given at the time of presentation.

OT08PP

GENENDER DIFFERENCES IN MULTITASKING USING LIKERT-TYPE QUESTIONNAIRE EVALUATED BY FIVE-POINT SCALE IN THE INDIAN POPULATION

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OBJECTIVES: The study was done to evaluate multitasking ability in the Indian population & to find out gender differences there of.

METHODS: In this study 324 volunteer students in the professional course from tertiary medical colleges of Mumbai in the age group of 18-25 yrs were recruited as subjects. The study was conducted using multitasking questionnaire containing 19 questions which are evaluated by Likert-type five- point scale.

RESULTS: Statistical analysis was done by chi-square test. Analysis of all the 19 questions was done. Significant difference (p<0.05) was found in question numbers 3,8,9,14 and difference was insignificant in remaining questions. When all questions were analysed together difference was found significant (p<0.05) in both the genders.

CONCLUSION: In this questionnaire based study females were found to be better in multitasking abilities as compared to males.

OT09PP

TRANSRECTAL ULTRASOUND - THE IDEAL METHOD FOR EVALUATION OF POTENTIALLY CORRECTABLE GENITOURINARY DEFECTS IN AZOOSPERMIC MEN.

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OBJECTIVES: The purpose of this prospective study was to evaluate the incidence of distal ejaculatory system defects with transrectal ultrasonography (TRUS) among patients evaluated for azoosperma.

METHODS: Forty-two patients with low-volume ejaculate and azoosperma were
evaluated by physical examination, serum follicle-stimulating hormone and luteinizing hormone level determination, karyotyping, selective screening for cystic fibrosis mutations, and TRUS.

RESULTS: On physical examination, in 29 patients (69%), either 1 (12 patients) or both (17 patients) of the vasa deferentia could not be palpated. In the group of 17 patients with bilateral involvement of the vasa deferentia, the ultrasonographic imaging universally showed bilateral absence or hypoplasia of the seminal vesicles with bilateral agenesis of the vasa deferentia and nonvisualization of both ejaculatory ducts. In the patients with a unilateral abnormality on physical examination, the ultrasonographic imaging showed absence of the ipsilateral seminal vesicle in 7 patients and the hypoplastic seminal vesicle in 5. In the group of 13 patients with normal physical examination findings, a variety of obstructive causes were diagnosed by TRUS examination.

CONCLUSION: Transrectal US is safe and accurate method for evaluating the distal male reproductive tract that helps identify patients with potentially correctable causes of infertility.

OT10PP
COMPARISON OF THREE NON-INVASIVE METHODS OF TEMPERATURE RECORDING IN HEALTHY NEWBORNS

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Temperature is an important parameter beside respiratory rate, heart rate, oxygen saturation and urine output to determine the degree of illness, further evaluation and treatment. False and late detection can lead to delay in diagnosis and treatment. Various sites of temperature measurement are oesophageal, rectal, bladder, temporal artery, aural and underarm. All types of measurement have certain advantages, disadvantages and limitations. In newborn rectal and axillary temperature measurement are most commonly used methods. Underarm temperature is not reliable since it has also many confounding factors which can alter the recording. Temporal artery temperature measurement by temporal scanner thermometer and aural temperature recording by thermoscan are two quick non-invasive device to record body temperature easily available today.

OBJECTIVES: To evaluate the accuracy of aural and temporal temperature measurement and compare with underarm temperature measurement by glass thermometer.

METHODS: Present study was hospital based using method-comparison design and included 126 newborns of both sexes who were delivered in the hospital during the month on May and June. Temperature was recorded by all three devices in all newborns in day time between 10.00 AM-2.00PM within 72 hours of birth.

Inclusion criteria: All stable and healthy newborns

Exclusion criteria: All sick newborns and who were admitted in nursery

Underarm, aural and temporal artery temperature was recorded by glass thermometer, Thermoscan by Barun type 6022 made in Germany and Temporalscanner
form Exergen, USA respectively as per manufacture instructions.

**RESULTS:** There was difference of more than 1 degree between the aural and underarm temperature was observed in approximately one-tenth of the newborns while between tympanic and temporal temperature was observed in one fifth of the newborns.

**CONCLUSION:** The three methods of temperature measurements correlated gave approximately similar results. So, any of these methods can be used for measuring the temperature in newborns.

**OT11PP**

**INTERACTION BETWEEN PUPIL CYCLE TIME (PCT) AND PHYSICAL ACTIVITY LEVEL (PAL) IN ALTERED STATE OF NUTRITION**

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Physical inactivity is an important risk factor for the development of coronary artery disease, as well as, other diseases including hypertension, diabetes, obesity, osteoporosis, and certain type of cancers. The problem is of particular concern in those countries that have transitional economics like India. Disorder on the parasympathetic nervous system (PNS) activity which is determined by the Pupil Cycle Time (PCT) and the interaction between the Physical Activity Level (PAL) is the concern of our present study. The PCT is measured by throwing white light on the edge of the pupil by an instrument called Haggstreit-type slit lamp. The counting was done for 90 cycles and average one count is considered single PCT. The Physical Activity Level (PAL) was determined by administering a physical activity level questionnaire developed in the Division of Nutrition, St. John's Medical College, Bangalore. The physical activity level is classified 1.55 to 1.75 as moderately active, <1.4 as sedentary and >1.75 as heavily active.

Sixty-three healthy male volunteers in the age group of 18-50 years were studied. They were divided in three groups based on their BMI as preobese/obese, normal/control, and undernourished. The PCT obtained for three groups are as follows: Normal control (904±63msec), undernourished (818±145msec) and obese/preobese (991±106 msec). Analysis of variance shows there is statistically significant difference between the three anthropometrically different groups (p<0.05) and three groups with different activity level with a confidence interval of 95%.

**RS01PP**

**LUNG VOLUMES IN OBSTRUCTIVE AIRWAY DISEASES.**

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**OBJECTIVES:** To measure lung volumes in patients with Obstructive airway diseases and grade severity of functional lung impairment

**METHODS:** This preliminary study was conducted in the Department of Physiology, RIMS. Forty (40) patients with Obstructive Airway diseases (25 bronchial asthma, 15 COPD patients), ages ranging from 18 to 65 years attending OPD and ward of Department of Respiratory Medicine, RIMS are included in the study. Ventilatory lung function was conducted on a Computerised Spirometer (Helios 701).
RESULTS: In asthmatic patients the mean FEV$_1$ was 1.86L, FEV$_1$ % predicted was 80.19% and FEV$_1$/FVC was 0.88. Grading of functional lung impairment of asthmatic patients was done according to the Global Initiative for Asthma guidelines based on FEV$_1$ % predicted. 48% of patients had mild Asthma (FEV1>80%), 36% of patients had moderate Asthma (FEV$_1$ 60-80%) and 16% of patients had severe Asthma (FEV1 <60 %). In COPD patients the mean FEV$_1$ was 1.45L, FEV$_1$ % predicted was 69.93% and FEV$_1$/FVC was 1.06. Grading of lung function was done according to Global Initiative for Chronic Obstructive Pulmonary Disease (COPD). 40% had mild (FEV$_1$≥80%), 33.3% had moderate (FEV$_1$ ≥50-80%), 20% had severe(FEV$_1$ ≥30-50%) and 6.7% had very severe disease(<30%).

CONCLUSION: Highest percentage of patients suffered from mild disease (40% in asthma, 48% in COPD). Mean FEV$_1$ and FEV % predicted was higher in asthmatic patients (1.86L, 79%) as compared to COPD patients (1.45L, 69.93%) but mean FEV$_1$/FVC was lower in asthma patients (0.8) as compared to COPD patients (1.06).

INFLUENCE OF ADIPOSITY ON LUNG FUNCTION TESTS IN YOUNG HEALTHY INDIVIDUALS.

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OBJECTIVES: Present study was done assess the influence of adiposity marker like body fat percentage on pulmonary function tests in young healthy individuals.

METHODS: A total of 50 young students (18 to 25 years) with moderately sedentary lifestyle were recruited in this study who were divided into normal and obese subjects. Their height, weight and body mass index (BMI) was estimated. The percentage of body fat was calculated by measuring skin fold thickness with the help of skin fold calliper. Pulmonary function tests were recorded on a computerized Schiller’s spirometer .Results were statistically analysed by unpaired t test and were co-related with body Fat Percentage using Pearson correlation co-efficient.

RESULTS: Body fat % showed negative correlation with forced expiratory volume at the end of first second (FEV1)/ forced vital capacity (FVC), maximum ventilatory volume (MVV), peak expiratory flow rate (PEFR).

CONCLUSION: The results indicate that increase in percentage of body fat has an impact on the pulmonary function tests even in younger age group. Hence we have to safeguard against the hazards of obesity by taking corrective steps through our health programs.

STUDY OF THE LUNG FUNCTION TESTS IN HEALTHY NON-SMOKING WOMEN USING DIFFERENT COOKING FUELS IN GHAZIABAD

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BACKGROUND: Biomass fuels are extensively used for cooking in developing countries like India and have adverse health effects.
**OBJECTIVES:** The present study was undertaken to assess the lung function tests in women of age group of 25-45 years using different types of cooking fuels (Biomass & LPG).

**METHODS:** 50 women residing in Dist. Ghaziabad using biomass as cooking fuel were selected as the study group. Lung function tests were done using computerized spirometer (New microlab-2008) and the results were compared with 50 age-matched control using LPG as cooking fuel. Cooking index (duration [hours] of exposure to fuel smoke /day × year of exposure to cooking fuel) was calculated for both the groups.

**RESULTS:** Result of the study were analysed by ANOVA with SPSS version 17.0 using paired t-test. Results of the study showed that FVC, FEV1, PEFR and FEV1/FVC were significantly reduced in women using biomass as compared to women using LPG as cooking fuel.

**CONCLUSION:** Measures should be taken to prevent exposure to the biomass fumes by proper ventilation and by modifying the type of chullha, so that future respiratory complications can be minimized.

**RS04PP**

**STUDY OF PULMONARY FUNCTION TESTS IN RICE MILL WORKERS.**

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**OBJECTIVES:** To study the morbidity pattern among the rice mill workers & the relationship between duration (yrs) of working and their morbidity status.

**Study design:** A Cross sectional study.

**METHODS:** A questionnaire was used to record the necessary informations regarding clinical history, socio-demographic status, results found clinically and results of PEFR (peak expiratory flow rate). The study was conducted in 5 rice mills in the paddy growing area of Davangere, under the Department of Physiology, SSIMS & RC, Davangere. Totally 60 workers (30 rice mill workers & exposed to rice husk dust & 30 healthy individuals not working in rice mills & not exposed to rice husk dust.) were considered in this study. The study was conducted in the month of September. “Chi-square test” was used for statistical analysis.

**RESULTS:** Among these 60 workers, 40.3% had respiratory morbidity. Out of them, 10.7% had PEFR less than 200L/min, 20.4% had low back ache and pain in the knee joint & 13% had myalgia throughout the body. 7.2% had conjunctivitis which was allergic in nature and 3% suffered from skin allergy.

**CONCLUSION:** More marked respiratory morbidity -40.3% and 0.7% workers having decreased PEFR were noticed. The statistical significance of association between duration (years) of working and respiratory morbid status is confirmed. The healthy status can be retained by promoting good health education and proper usage of safety devices & still further studies are recommended.

**RS05PP**

**VITAL CAPACITY (VC): PREDICTIVE INDICATOR FOR MAXIMAL OXYGEN UPTAKE (VO_{2MAX}).**

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OBJECTIVE: Vital capacity (VC): Predictive indicator for maximal oxygen uptake (VO2max).

METHODS: The study was carried out on hundred healthy volunteers of Haryana origin of either sex in the age group of 18-40 years drawn from the staff members, medical students and healthy attendants accompanying the patients to this institute. The study was conducted to determine the correlation between VO2max and VC. Prior to being selected as a subject all volunteers gave a written consent and filled a proforma showing their habits, level of activity and previous medical history. All the subjects were untrained, non-smoker and normal on clinical examination. The subjects were divided into four groups:

Group I - 18-23 years
Group II - 24-29 years
Group III - 30-35 years
Group IV - 36-40 years

DETERMINING MAXIMAL OXYGEN UPTAKE (VO2MAX)
The VO2max was determined by plotting the submaximal heart rates on the Astrand Rhyming nomogram and the predicted VO2max was corrected for age.

DETERMINING VITAL CAPACITY (VC)
The VC was measured by using the vitalograph and the results obtained were subjected to statistical analysis.

RESULTS: The correlation between the two parameters was found to be statistically significant among the males of all age groups and the female subjects of group I, II and III.

CONCLUSION: The results of present study establish a positive correlation between VC and VO2max.

RS06PP

COMPARISON OF PEAK EXPIRATORY FLOW RATE IN OBESE AND NON-OBESE INDIVIDUALS IN AGE GROUP OF 18-25 YEARS.”

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OBJECTIVES: Comparison of Peak expiratory flow rate in obese and non-obese individuals in age group of 18-25 years.

1. To compare and correlate peak expiratory flow rate in obese and non-obese individuals.
2. To compare and correlate peak expiratory flow rate in obese with normal waist hip ratio and obese with abnormal waist hip ratio.

METHODS: 76 volunteers were analysed and classified into obese and non-obese based on body mass index (BMI). Waist circumference, Hip circumference was measured and waist hip ratio (WHR) was calculated .The peak expiratory flow rate (PEFR) was measured using Wright's peak flow meter.

RESULTS: There was significant decrease in PEFR in obese as compared to non-obese with (p=0.000). There was strong negative correlation between BMI and PEFR .There was significant decrease in PEFR in obese with abnormal WHR as compared to obese with
CONCLUSION: Abdominal obesity may influence PEFR by restricting the force generated by expiratory muscles primarily abdominal muscle. Therefore BMI as well as WHR should be considered to observe effect of abdominal obesity on PEFR.

RESULTS: Values of physical parameters like age, height, weight, BMI were not significantly different between smokers & non-smokers. All pulmonary function test parameters showed statistically significant difference (P<0.01) between smokers & non-smokers on applying statistical tests.

CONCLUSION: Smoking of tobacco in form of cigarettes/biddies has an adverse effect on pulmonary functions due to chemicals like nicotine & carbon monoxide which affect alveoli & also cause airway narrowing. Thus spirometry helps in early diagnosis of respiratory diseases.
were randomly sampled from the Maharishi Markandeshwar University. The students in the age group of 17-22 years were selected and the test was performed using computerized spirometer. Values of FVC, FEV1 and PEFR were recorded.

**RESULTS:** In present study it was found that pulmonary function test was significantly higher in males as compared to female students with FVC,FEV1 and PEFR highly significant having (P value <0.0001).

**CONCLUSION:** The study revealed that Pulmonary function test are high in males as compared to females likely due to large chest size and more muscle power.

**RS09PP**

**EFFECT OF BMI ON LUNG FUNCTIONS IN COPD PATIENTS.**

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**OBJECTIVES:** Body mass index(BMI) is an important indicator that can well reflect nutritional status of patients, and low BMI is an independent risk factor for mortality in patients with COPD. The aim of the present study was to evaluate the association between BMI and lung functions in patients with COPD.

**METHODS:** 152 stable COPD patients with ages ranging between 40 and 70 years (group mean ± S.D., 57±0.5 years) were studied. BMI was calculated as weight (kg)/length²(m). Based on their BMI, patients were assigned to three groups: overweight group (n=50;BMI ≥25), normal weight group(n=47;18.5 ≤BMI <25), underweight group (n=55;BMI <18.5). Pulmonary Function Test was done using a computerized Spirometer. Pulmonary function test parameters FVC, FEV1 and FEV1/FVC were evaluated. Multiple comparisons among groups were analyzed by Student’s test. Pearson correlation analysis was used to determine the relationship between BMI and pulmonary function. A P value of <0.05 was considered statistically significant.

**RESULTS:** FEV1/FVC and FEV1% Pred were lowest in the underweight group and highest among the overweight patients. A positive correlation between BMI and FEV1/FVC, FEV1% Pred was observed (correlation coefficient (r) was 0.823, 0.870 respectively, both P values were <0.05).

**CONCLUSION:** The result of study showed that BMI is positively related to pulmonary function of COPD patients. It could be recommended that maintaining a healthy weight is necessary for COPD patients.

**RS10PP**

**EFFECTS OF CHALK DUST ON PEAK EXPIRATORY FLOW RATE AMONG SCHOOL TEACHERS USING CHALK AND BOARD.**

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**OBJECTIVES:** In India most of the schools use chalk and blackboard for teaching. Exposure to chalk dust may induce acute and chronic respiratory ailments. The objective of the study was to assess the effects of chalk dust on Peak Expiratory Flow Rate (PEFR) of
teachers relative to their age matched controls. The aim of this study is to study the effect of chalk dust on lung function of teachers who use chalk and board compared to their matched control.

**METHODS:** PEFR was measured in 75 teachers using chalk and board, and similar number of control subjects; all participants were nonsmokers with age range from 20 to 50 years. The subjects were matched for age sex and height. PEFR was measured using peak flow meter as per EU scale and results were compared by an unpaired t test.

**RESULTS:** Significant reduction in the PEFR was observed in teachers using chalk and board relative to their matched controls.

**CONCLUSION:** Based on results of present study, we conclude that teachers using chalk and board are at an increased risk of developing occupationally related pulmonary function impairments. The results suggest that there is urgent need to shift from routine chalk and board to marker and board.

**RS11PP**

**PULMONARY FUNCTION TESTS IN DIFFERENT PHASES OF MENSTRUAL CYCLE IN YOUNG GIRLS OF KULASEKHARAM, KANYAKUMARI DISTRICT.**

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**OBJECTIVES:** To compare the pulmonary function tests in follicular phase and luteal phase of menstrual cycle.

**METHODS:** 50 healthy medical students from 1st year MBBS of Sree Mookambika Institute of Medical Science with regular menstrual cycle are consented for this cross sectional study. Detailed history including height and weight are recorded in a separate form. Pulmonary function tests are done in follicular phase and luteal phase of menstrual cycle using Spiro excel (Medicaid systems, Chandigarh) computerized programme in the research lab of Department of Physiology. The parameters taken are FVC, FEV₁, FEV₁/FVC and PEFR. Student’s t test is used to find the statistical significance between the two phases of menstrual cycle.

**RESULTS:** FVC, FEV₁, FEV₁/FVC, PEFR are found to be significantly higher in luteal phase when compare to follicular phase of menstrual cycle.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Follicular Phase</th>
<th>Luteal Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>FVC</td>
<td>2.58±0.18</td>
<td>2.75±0.19</td>
</tr>
<tr>
<td>FEV₁</td>
<td>2.36±0.18</td>
<td>2.60±0.17</td>
</tr>
<tr>
<td>FEV₁/FVC</td>
<td>91.75±3.61</td>
<td>94.63±2.41</td>
</tr>
<tr>
<td>PEFR</td>
<td>4.51±0.25</td>
<td>4.72±0.07</td>
</tr>
</tbody>
</table>

**CONCLUSION:** The increase in pulmonary function tests parameters in luteal phase could be due to the bronchial relaxation effect of progesterone.

**RS12PP**

**A STUDY OF THE PULMONARY FUNCTION TEST AMONG SMOKERS AND NON SMOKERS.**

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OBJECTIVES: In India smoking is a common habit in both the urban and rural areas. There are many respiratory diseases like chronic bronchitis, bronchial carcinoma and emphysema which are caused due to chronic tobacco smoking. The World health organization reported that tobacco smoking killed 100 million people worldwide in the 20th century and warned that it could kill one billion people around the world in the 21st century also.

METHODS: In this study 100 healthy male subjects, 50 chronic smokers and 50 non-smokers were assessed for their pulmonary function tests by using a computerised spirometer.

RESULTS: Almost all their respiratory parameters were significantly reduced.

DISCUSSION: In the present study obstructive lung dysfunction was the commonest finding in smokers.

Key words: Smoking, spirometer, smokers, non-smokers

RS13PP

AUTOMOBILE EXHAUST AND PULMONARY FUNCTION TESTS.

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OBJECTIVES: To study the effect of inhalation of automobile exhaust on the pulmonary function tests.

METHODS: This study was a case control study done in a teaching hospital of Punjab. Seventy five cases were studied and they included the persons working at petrol pumps for minimum duration of twelve months and equal numbers of controls (composed of medical students) were compared for the values of pulmonary function tests. The data was collected using preformed Proforma by history taking and physical examination in the human physiology laboratory of the department of physiology. They were asked to attend the department in the morning hours. A detailed history and clinical evaluation was done. Their pulmonary functions like FVC, FEV1 and FEV1/FVC ratio were tested with computerized RMS Medspiror (PC Based, Windows Version, RMS Recorders and Medicare Systems) in sitting position. The recordings were taken and statistically analyzed.

RESULTS: The mean age in years (26.31± 4.06 vs.27.01±3.99), weight in kilogram (58.03±5.23 vs. 56.39 ±6.13) and height in centimeter (158.36±3.25 vs. 160.3 ±4.31) of the cases and controls were comparable. The FEV1, FVC, inspiratory and expiratory flow rates were significantly less in the automobile exhaust group (p value < 0.05).

CONCLUSION: The chronic exposure to the automobile exhaust leads to significant derangement in the pulmonary function tests.

RS14PP

COMPARATIVE STUDY OF CARDIOVASCULAR FITNESS (VO2 max) AMONG YOUNG ADULT MALES AND FEMALES OF HARYANA.
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OBJECTIVES: Maximum oxygen uptake (VO$_{2\text{max}}$) is considered as a bench mark to quantify cardiovascular function capacity and aerobic fitness. The aim of this study was to compare the cardiorespiratory fitness in terms of maximum aerobic capacity (VO$_{2\text{max}}$) among young adult male and female students of Maharishi Markandeshwar University (MMU), Mullana, Haryana.

METHODS: A total of 57 students in the age group of 18-24 years were recruited by simple random sampling from the Maharishi Markandeshwar University, Haryana. VO$_{2\text{max}}$ was estimated indirectly by following the protocol of Queen’s College Step Test (QCT) methods.

RESULTS: Out of 57 students there were 30 males and 27 females. The mean age of males was 19.033 ± 1.650 years and that of the females was 18.556 ± 1.577 years (p = 0.2699). There was no statistically significant difference in the body mass indices of the two sexes [24.536 ± 4.004 Kg/m$^2$ in males versus 23.315 ± 4.922 Kg/m$^2$ (p = 0.3067)]. The mean value of VO$_{2\text{max}}$ for males was 45.66 ± 8.96 ml/kg/min and for females it was 37.85 ± 4.3 ml/kg/min, which was found significantly higher in males than in females (p<0.0001). No statistically significant difference was observed in the mean values of VO$_{2\text{max}}$ in obese (41.333 ± 8.778 ml/Kg/min) and non-obese students (42.256 ± 7.903 ml/Kg/min, p = 0.6938); neither was any difference observed in this regard in either of the two sexes (44.700 ± 9.650 ml/Kg/min in obese males versus 46.150 ± 8.816ml/Kg/min in non-obese males, p =0.6836 and 37.125 ± 5.566 ml/Kg/min in obese females versus 38.158 ± 3.905 ml/Kg/min in non-obese females, p = 0.5853).

CONCLUSION: We conclude that the cardiorespiratory fitness of males is better as compared to that of females and body mass index does not have any effect on it.

RS15PP

INVOlVEMENT OF HISTAMINE IN OLEIC ACID-INDUCED ACUTE LUNG INJURY IN ADULT RATS

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OBJECTIVES: Acute lung injury is a severe illness with high mortality but the mechanisms involved are not clear. This study was undertaken to elucidate the role of histamine in acute lung injury.

METHODS: Experiments were performed on anesthetized rats with arterial cannulation (to record BP); tracheal cannulation (to keep the respiratory tract patent) and jugular vein cannulation to deliver saline/oleic acid/drug.

Animals were divided into 3 groups; Oleic acid (60µL)-treated group; time-matched control group, and anti-histamine (pheniramine, 3µg/kg)-pretreated group. Respiratory rate, BP and ECG were recorded after injecting saline/drug followed by saline/oleic acid. Pulmonary water content was determined by physical methods and histological examination.
RESULTS: Oleic acid produced acute lung injury and manifested as initial increase (44%) in respiratory rate followed by decrease and finally leading to respiratory arrest and death by 45 min. Heart rate and mean arterial pressure exhibited a progressive fall. Pulmonary water content was increased significantly as compared to control. Histological examination showed massive pulmonary edema and infiltration by inflammatory cells.

In time-matched control group, no significant changes were observed. In pheniramine-pretreated rats, oleic acid produced only slight initial changes and the respiratory rate, heart rate and mean arterial pressure remained stable (about 90% of initial) till 60 min, subsequently the condition deteriorated. There was no increase in pulmonary water content and lung histology exhibited only mild edema with few infiltrations. Pheniramine pretreatment prolonged the mean survival time (105 min).

CONCLUSION: Histamine plays a vital role in the pathophysiology of acute lung injury.

RS16PP

EFFECT OF CONSTRUCTION SITE DUST ON PEAK EXPIRATORY FLOW RATE IN FEMALES WORKING AT THOSE SITES

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OBJECTIVES: Construction site workers are exposed to various substances like cement, brick and sand dust and dust from ground, roofing, paving and stone work are potentially hazardous to the respiratory system. Deposition of these particles in the respiratory tract has been implicated with increased pH, leading to mucous membrane irritation. Studies show that women are at higher risk in developing shortness of breath. Since, previous studies pertaining to lung function especially PEFR, was done in male subjects only, this work was carried out to determine the PEFR of female construction site workers.

METHODS: Experimental group included 40 female construction site workers of age group 20-40 years working for more than 10 years and control subjects involved 40 working females of same age group and socio-economic status. Basic data of the subjects were noted and PEFR was recorded.

RESULTS: The age of construction workers was 34.48±6.59 years and BMI 23.09±4.19. Age of the control group was 32.97±7.32 years and BMI 26.71±5.96. PEFR recorded in the control group was 270±38.44 l/min and the worker group had PEFR 249±40.35 l/min.

CONCLUSION: This study shows that PEFR in female workers was less than the control group and chronic exposure to respirable dust could be the reason for decrease in peak expiratory flow rate.

RS17PP

CORRELATION BETWEEN BORG'S RATE OF PERCEIVED EXERTION AND VO2max IN INDIAN MALE MEDICAL STUDENTS.

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OBJECTIVES: To assess and evaluate the correlation between Borg's Rate of Perceived Exertion (RPE) & VO₂max in young Indian male medical students and to validate the Borg's RPE as a criterion to regulate the exercise intensity.

METHODS: 100 young healthy Indian male medical students from a well-known tertiary care hospital of Greater Mumbai, in the age group of 18-22 years were included in the study. Prior to testing, each participant was instructed on the usage of Borg's RPE scale and were asked to perform Queen's College step-test for 3 minutes. At each minute, the subject was asked to rate their exertion on Borg's RPE scale. After the completion of the test, the heart rate of each participant was recorded and maximal oxygen uptake (VO₂max) was computed indirectly by employing the Queen's step test formula. The correlation between Borg's Rate of Perceived Exertion (RPE), heart rate and VO₂max was evaluated using Pearson Correlation Test.

RESULTS: Borg's RPE showed significantly positive correlation with heart rate (r = 0.72; p<0.001) and significantly negative correlation with VO₂max (r = -0.72; p<0.001) using SPSS version 20 software.

CONCLUSION: Borg's RPE can be considered a valid criterion to assess and regulate exercise intensity in young Indian male population.

A COMPARATIVE STUDY ON EFFECT OF INHALED SALBUTAMOL AND IPRATROPIUM BROMIDE ON THE BRONCHOMOTOR TONE IN NORMAL YOUNG ADULT

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OBJECTIVES: The regulation and fine tuning of airways caliber is mainly determined by bronchial tone through airway smooth muscle contraction or relaxation. Under normal condition contractile and relaxant factors maintain a sensitive balance in which the ANS plays an important role. Sympathetic system causes dilatation of the bronchial tree through beta-adrenoreceptor but, major tone is maintained by the muscarinic receptors. The purpose of the present study to investigate whether there is any difference between the bronchodilating effects of inhaled salbutamol and ipratropium bromide and to evaluate the selective role of the two components of the ANS in regulation of bronchomotor tone in young adults.

METHODS: Fifty medical students of age group 17-25 years (35 male and 15 female) are taken as study group. They were subjected to spirometry measurements with windows based "Flowhandy ZAN 100USB& XAN Software 3.xx". History and general examination of subjects were done and their pulse, BP, O₂ saturation recorded by clarity med PMS 320 Cardiac monitor. On day 1, baseline spirometry recorded, followed by repeat spirometry 20 minutes after administering 2 puffs of salbutamol through MDI. On day-2, 2 puffs of ipratropium bromide administered through MDI and spirometry done after 35 minutes.

RESULTS: Statistical analysis showed a significant increase in FEV1, PEF, MEF75, MEF25-75 with both the drugs, but the increase was more with ipratropium bromide.
Whereas the change in static lung parameter was not statistically significant.

**CONCLUSION:** From this study, we found that in terms of bronchodilating effect, Ipratropium bromide is a better drug than salbutamol.

**RS19PP**

**EFFECT OF OBESITY ON PEAK EXPIRATORY FLOW RATE IN YOUNG ADULTS**

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**OBJECTIVES:** Although several factors such as respiratory muscle strength, lung compliance, resistance to airflow, and even obesity affect the lung functions, the nature of relationship with markers of obesity is not clear. We hypothesised that increased weight is a significant predictor of decreased peak expiratory flow rate (PEFR). The present study was designed with the aim to examine the effects of obesity on PEFR in healthy subjects.

**METHODS:** 40 healthy volunteers of mean age of 18.33±1.02 years were chosen among the medical and para-medical students of Kalinga Institute of Medical Sciences, Odisha. Subjects with history of smoking, asthma and any other lung diseases were excluded from the study. The PEFR was measured by using Mini Wright’s peak flow meter. Three readings were taken and the best of three was considered. Height and weight were measured as per standard WHO norms and body mass index (BMI) was computed. Data was analyzed using unpaired t test taking p value <0.05 as statistically significant.

**RESULTS:** There was statistically significant correlation between increase in BMI and PEFR values (p < 0.0001, t= 27.556). Our results are consistent with other studies showing that the results of these tests cannot be interpreted appropriately without reference to predicted normal values. Moreover males recorded higher PEFR values than females proving that the respiratory muscle strength of males is more than females.

**CONCLUSION:** Obesity could effect asthma medications like steroids used frequently by the asthmatics. Thus by incorporating simple test of BMI we can predict the response of medications to lung functions.

**RS20PP**

**PRANAYAMA HAS ADDITIVE BENEFICIAL EFFECTS ALONG WITH MEDICATION IN BRONCHIAL ASTHMA PATIENTS.**

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**OBJECTIVES:** Compare FVC, FEV1, FEV1/FVC, PEFR in Bronchial asthma patients under treatment practicing pranayama (study group) and not practising pranayama (Control group).

**METHODS:** Present study has been conducted in the department of physiology at S. N. Medical College, Agra with the help of computerized micro lab spirometer in 3 months. 80 cases of bronchial asthma practising pranayama forms the study population and 20 bronchial asthma patients not practising pranayama will forms the control group. History of cigarette smoking, hypertension, diabetes and chronic chest infections like T.B. and chest deformity were excluded in the study. The cases were
instructed by train yoga instructor to perform Anuloma-viloma and kapalbhati pranayama regularly for 3 months and then dynamic lung function parameter FVC, FEV1, FEV1/FVC, PEFR was recorded before and after pranayama and observation were studied by applying student t test and evaluated statistically.

**RESULTS:** On comparing study and control group, FVC, FEV1, FEV1/FVC, PEFR are improved in both study and control group, after 1st month of pranayama but improved in study group, not in control group after 2nd & 3rd month of pranayama.

**CONCLUSION:** Pranayama has additive beneficial effect along with medication in bronchial asthma patients.

**RS21PP**

**A COMPARATIVE STUDY ON EFFECT OF ACUTE EXERCISE ON PULMONARY FUNCTION TEST OF FIRST YEAR M.B.B.S. STUDENTS.**

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**OBJECTIVES:**
1) To study the pulmonary function test in 1st year M.B.B.S. students.
2) To compare the changes in pulmonary function test before and after exercise of those students.

**METHODS:** Instruments used were Weighing Machine, Anthropometer, Medspiror, 16.25 inches / 41.3 cm step, stopwatch Sixty healthy students of both sex of Indian ethnicity in the age group of 18 – 28 years were included in the study. Subjects with BMI more than 25 and known respiratory diseases like Bronchial Asthma, Bronchitis, Tuberculosis, Emphysema and with clinical abnormalities of the vertebral column and thorax, Diabetes mellitus, smokers were excluded from the study. Subject's anthropometric parameters are fed into the device which include Age, Sex, Weight and Height. Pulmonary function were recorded in the same time of the day in sitting position at rest and immediately after step up and down exercise in Queens college steps for 3 minutes and the results were compared.

**RESULTS:** Results were analysed online in graphpad.com using paired and unpaired t-test. Spirometric variables, such as forced vital capacity (in boys 3.3033 ±0.379 at rest, 3.9477±0.29 after exercise & in girls 2.5±0.298 at rest, 3.0583±0.22 after exercise) and forced expiratory volume in 1s (in boys 3.0037 ±0.322 at rest, 3.5567 ±0.2699after exercise & in girls 2.3170±0.28 at rest, 2.7217±0.2361 (after exercise) rises significantly (P<0.0001) in both the groups. The values of FEV25-75% was also found to be significantly higher in boys (P<0.0001) and girls (P=0.015) before and after exercise. Whereas FEV1/FVC does not rises significantly after exercise (P=0.5568) in boys (At rest: 0.9116±0.053; After exercise: 0.9028±0.059) but was significant (P=0.015) in girls (FEV1/FVC) at rest (0.9280±0.0578), after exercise (0.8908±0.0598).

When the values of both the sexes were compared it was found that before exercise FVC,FEV1 and FEV25-75% was significantly higher in boys than in girls and this significant difference was also maintained even after exercise. However, the values of FEV1/FVC before exercise (P=0.2590) and after exercise
(P=0.4392) was not significant in between boys and girls.

**CONCLUSION:** This study confirms the earlier observations that spirometric variables increase after acute exercise, and also the values of the spirometric variables are higher in boys than in girls.

**RS22PP**

**TO OBSERVE THE RESPIRATORY CHANGES AFTER STAIRCASE ASCENT AND DESCENT AND ITS RELATIONSHIP WITH BODY MASS INDEX AND FUNCTIONAL RESIDUAL CAPACITY.**

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**OBJECTIVES:** To observe and compare the respiratory changes after staircase ascent and descent in the medical students and to study its relationship with body mass index (BMI) and functional residual capacity (FRC).

**METHODS:** Study was carried out on 100 healthy medical students of a Tertiary Hospital in Mumbai in the age group of 18-22 yrs with proper consent. They were divided into two groups of 50 male and 50 females. The basal respiratory rate was measured. They were asked to ascent and descent 150 stairs following which the respiratory rate was recorded immediately. The recovery time that is the time required for the respiratory rate to return to basal level was also noted. FRC was calculated by the formula: \( \text{FRC} = (5.95 \times \text{height}) + (0.019 \times \text{age}) - (0.086 \times \text{BMI}) - (5.3) \)

**RESULTS:** Statistical analysis showed significant changes in the respiratory rate after staircase ascent than descent and it is more in the female subjects. There is significant difference in the FRC of the two groups.

**CONCLUSION:** Staircase ascent showed significant increase in respiratory rate, especially in females and it also has significant relationship with functional residual capacity.

**RS23PP**

**BENEFICIAL EFFECT OF GRAPE SEED EXTRACT (GSE) IN PATIENTS WITH OBSTRUCTIVE SLEEP APNEA SYNDROME (OSAS).**

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**OBJECTIVES:** To investigate whether i) inflammatory mediators play a role in the symptoms, ii) oxidative stress is an underlying cause and iii) oral intake of the anti-oxidant GSE is beneficial in patients with OSAS.

**METHODS:** Twenty patients with OSAS were enrolled in the study. After polysomnography (PSG), they were randomly assigned to receive a placebo \((n = 10)\) or GSE \((n = 10)\). A repeat PSG was done after the treatment period of 5 weeks. Venous samples were collected for various biochemical analyses.
**RESULTS:** In the patients of GSE group, compared to their baseline values, Epworth sleepiness score (13.9±1.2 vs 8.9±1.6, p<0.01), apnea-hypopnea index (66.4±9.6 vs 60.6±9.7, p<0.05) and CPAP pressure required to keep airways patent (10.2±0.7 vs 8.3±1.1 cm of H2O, p<0.05) decreased. GSE produced improvements in total anti-oxidant capacity (202.6±25.5 vs 269.3±27.7 mmol/L, p<0.01) and total reduced glutathione (4.8±0.1 vs 5.9±0.1 mmol/L, p<0.01) and, decreases in lipid peroxidation (12.2±0.6 vs 7.5±0.3 µmol/L, p<0.01) and plasma tumour necrosis factor (TNF) α levels ( 25.9±0.5 vs 24.3±0.5 pg/ml, p<0.01). Such responses were not evident in the placebo group. 

**CONCLUSIONS:** In patients with OSAS, there is oxidative stress and an increase in the concentration of inflammatory mediators. Oral GSE administration appears to have a therapeutic potential in the treatment of OSAS. It is proposed that long-term treatment with GSE in patients with OSAS may reduce their dependency on continuous positive airway pressure therapy.

**RS24PP**

**VENTILATORY IMPAIRMENT IN PETROL PUMP WORKERS.**

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**OBJECTIVES:** The lung functions of 133 subjects (33 controls and 100 petrol pump workers) were studied.

**METHODS:** The study group comprised of healthy non-smoking males in the age group of 20-40 years working in different petrol pumps in Jammu city and its outskirts within a radius of 10 km. The control group comprised of 33 healthy non-smoking adult males between the age group of 20 to 40 years working in the hospital as nursing orderlies, medical assistants and other hospital personnel. After taking a detailed history and thorough clinical examination, subjects with the history of smoking, drug addiction, abdominal and chest surgery and cardiorespiratory illness were excluded from the study. The physical parameters noted for each subject were age in years, height in centimeters, weight in kilograms and body surface area in square meters (Toshniwal-Du Bois Nomogram).

The various lung function tests recorded were:-
1. Forced vital capacity (FVC).
2. Forced expiratory volume in 1st second (FEV1).
4. Peak expiratory flow rate (PEFR).

The pulmonary function tests were recorded by Medspior (Records and Medicare System). These readings were taken at the same time of the day in sitting position and best of the three readings was incorporated in the study.

**RESULTS:** The mean FVC and FEV1 values showed significant decline in petrol pump workers which revealed increased airway resistance in them (FVC, p=0.0007; FEV1, p=0.05). The mean value of MVV and PEFR was also significantly lower in petrol pump workers (MVV, p=0.000; PEFR, p=0.0001).

**CONCLUSION:** Results show that ventilatory efficiency of lung is decreased in petrol pump workers. The decline in lung functions in petrol pump workers could be due to exposure to petrol fuel vapours, diesel exhaust and airborne particulate matter at petrol pumps.

**Key words:** Ventilatory lung function, petrol pump workers, benzene.
EFFECT OF DURATION OF THE EXPOSURE ON PEAK EXPIRATORY FLOW RATE AMONG WORKERS EXPOSED TO WOOD DUST.

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OBJECTIVES: The objective of the study is to assess the effect of wood dust and duration of the exposure on Peak Expiratory Flow Rate (PEFR) among saw mill workers in Nagpur city (Central India).

METHODS: The study was conducted during March-August 2012 in the clinical physiology laboratory, IGGMC, Nagpur. It was designed as a case-control cross-sectional study of spirometry in eighteen non-smoking wood workers, aged 25-40 yrs, and sixteen aged matched healthy controls selected from same residential district with various occupations other than saw mill work. The selection of subjects and healthy controls was based on the detailed history, exclusion criteria and clinical examination. Data was collected using Respiratory questionnaire and spirometry using Physiopac (PP-4) Windows based computerized Polygraph machine. PEFR were obtained on computed spirometry software by performing FVC maneuver, in sitting position with the application of nose clip. Results were compared using unpaired student’s t test.

RESULTS: PEFR (L/sec) of the workers exposed to wood dust for the period of 1-4 yrs n = 8, 4.67 ± 0.64 (P value < 0.025), 4-8 yrs n = 6, 4.24 ± 0.31 (P value < 0.05), > 8 yrs n = 4, 3.61 ± 0.37 (P value < 0.05) and total of 1-15 yrs n = 18, 4.29 ± 0.32 (P value < 0.001) were significantly reduced.

CONCLUSION: Based on the present study we concluded that PEFR in wood workers decreases as the period of exposure to wood dust increases.

EFFECT OF DEEP BREATHING EXERCISES ON SOME KEY MARKERS OF STRESS IN GARMENT FACTORY WORKERS.

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OBJECTIVES: Occupational stress is ongoing stress related to the workplace. India has a prolific readymade garment industry and its employees often work under difficult conditions leading to stress. Chronic stressors can cause dysregulation of multiple interrelated physiological systems, which if prolonged, may lead to elevated (or reduced) levels, in the blood, of several biological parameters. Stress management is the amelioration of chronic stress and deep breathing exercises is one such type of relaxation technique that can be used to reduce occupational stress.

METHODS: Present study included 60 male garment factory workers and 30 controls. After written consent a baseline estimation of the following markers of stress: cortisol, DHEA-S, C-reactive protein, IL-6 and oxidative markers like serum malondialdehyde, reduced glutathione and catalase was done from blood samples of all subjects. The test
group was divided into 2 groups: the intervention group, who were given deep breathing exercises, everyday for 3 months duration, and a no intervention group. After 3 months both test groups were examined to assess the effect of deep breathing exercises on above stress parameters.

**RESULTS:** The values of DHEAS-S, reduced glutathione and catalase showed a significant increase while the rest showed a significant decrease in values indicating favourable changes in these parameters following deep breathing exercises. C-reactive protein, however, remained within normal range in all subjects.

**CONCLUSION:** As the 2 sub test groups differed only with respect to the intervention, we can relate the better results of the intervention group to the effect of the relaxation technique and thus recommend the use of the same or similar techniques for other factory workers.

**RS28PP**

**A STUDY ON THE PEAK EXPIRATORY FLOW RATE BEFORE AND AFTER EXERCISE IN FIRST YEAR MBBS STUDENTS**

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**OBJECTIVES:** 1) To study the change in peak expiratory flow rate before and after acute exercise of the first year M.B.B.S students.  
2) To compare the peak expiratory flow rate changes among males and females.

**METHODS:** Instruments used were Weighing Machine, Anthropometer, Wrights peak flow meter, 16.25 inches / 41.3 cm step, stopwatch  
Sixty healthy students of both sex of Indian ethnicity in the age group of 18 – 28 years were included in the study. Subjects with BMI more than 25 and known respiratory diseases like Bronchial Asthma, Bronchitis, Tuberculosis, Emphysema and with clinical abnormalities of the vertebral column and thorax, Diabetes mellitus, drug addicts, smokers were excluded from the study.  
Subject's parameters are recorded which include Age, Sex, Weight and Height. Peak expiratory flow rate were recorded in the same time of the day in sitting position at rest and immediately after step up and down exercise in Queens college steps for 3 minutes and the results compared.

**RESULTS:** Results were analysed online in graphpad.com using paired and unpaired t-test. Acute exercise for 3 minutes in Queens college step test has significantly (P<0.0001) increases the Peak expiratory flow rate in both boys (6.476±0.273 at rest, 7.3573±0.35 after exercise )and girls(5.924±0.228 at rest, 6.1507±0.35 after exercise) compared to that of rest. Whereas the PEFR values before exercise is compared between boys and girls is not found to be significant (P=0.1314) but the values were less in girls; but the difference becomes significant after exercise (P<0.0001) with more increase in PEFR in boys.

**CONCLUSION:** This study confirms the prior observation that PEFR increases after acute exercise in both the sexes. This study also shows that in normal condition though the PEFR is less in girls than in boys but it is not significant, but after exercise the difference in PEFR between the two sexes becomes significant.
OBJECTIVES: Our society poses enough stressful circumstances to affect all of us. There is a great deal of stress, discomfort, and discord in our world. Everyone is driven by something - fear, guilt, anger or the need to be loved it is important that we think about what is driving us because whatever it is, is taking control of our minds. When we say that someone is out of control, we usually mean that the person is dangerous to herself and others.

Overstress breaks the body's internal rhythm, or equilibrium. Over a long enough time, and because of the body's adaptive mechanisms, there is a retraining of the autonomic and endocrine systems. This can lead to feelings of helplessness, frustration, depression, and disappointment, and to stress-related illnesses – to distress. For most people who suffer from chronic conditions could be described as the result of a long term sympathetic response. Between 50 percent and 90 percent of the occupied hospital beds in the United States at any given time are being used by people suffering from symptoms caused or aggravated by mental stress.

The beginning of the disease process starts with postural distortion. (Dr. Hans Seyle, Nobel Leureate). A less than optimum spine and posture position (form), relative to gravity, results in the loss of the individual's ability to function optimally.

Dr. Roger Sperry, (Nobel Prize Recipient for Brain Research) demonstrated that 90% of the brain's energy output is used in relating the physical body to gravity. Only 10% has to do with thinking, metabolism, and healing.

Emotional stress, injury and disease cause muscular tension, and that in turn, muscular tension can be a cause of injury and disease. As muscles and surrounding tissue harden and tighten, bones and other body tissues are pulled out of a normal, balanced structural alignment. (Dr. Ida P. Rolf)

CONCLUSION: Among the many physiological functions adversely affected by stress is our breathing. Even when stress is minimal few people retain a habit of natural, full breathing which is required for maintaining a good mental and physical state. Proper breathing is essential for sustaining life and cleansing inner body systems. By learning proper breathing techniques stressful situations may be handled better and overall mental and physical health will be improved.

Keywords: Society, Overstress, Muscular tension, Postural distortion and disease, Breathing

PH01PP

MEDICAL AUDIT OF PRESCRIBING PATTERN IN UPPER RESPIRATORY TRACT INFECTION CASES AT OTOLARYNGOLOGY OUTPATIENT DEPARTMENT OF A TERTIARY CARE HOSPITAL

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**OBJECTIVE** "Medical Audit" is a tool to evaluate the quality of patient care by measuring the extent to which clinician adhered to the norms and standards of medical practice while treating a patient on the basis of documented evidence. Its main aim is to make the medical care more rationale and cost effective.

**METHODS:** All the prescriptions with the diagnosis of upper respiratory tract infection (URTI) from the otolaryngology outpatient department of Swaroop Rani Nehru Hospital, Allahabad for 6 days (24/09/2012-29/09/2012) were collected. These were analyzed for number of drugs per prescription, classification of drugs, % prescribed by brand/generic name and incidence of polypharmacy.

**RESULTS:** 256 prescriptions were analyzed. A mean total no. drug per prescription was 4.1. Polypharmacy incidence was very high (78%). All drugs were prescribed by brand names and none by generic name. Antimicrobials were prescribed in all prescriptions out of which 68 % were cephalosporins, 18% penicillins, 11% quinolones, 8% macrolides and 2% others. Frequency of prescribing other drugs was antihistaminics 94%, NSAID’s 79%, Multivitamins 74%, antacids 68%, gargles 22%.

**CONCLUSION:** Prescribing antimicrobials in every case of URTI was irrational. Moreover newer and costlier antimicrobials like 3rd generation cephalosporins were preferred over older and cheaper antimicrobials. High incidence of polypharmacy and prescribing only by brand names was also observed. All these increase the cost of prescription irrationally. Regular medical audits followed by discussion with the prescribing clinicians helps in the development of more rational and cost effective prescribing habits. Evaluation of prescribing trends also provides valuable information about treatment trends as well as disease patterns.

**PH02PP**

**A PROSPECTIVE RANDOMIZED OPEN LABEL STUDY COMPARING EFFICACY AND TOLERABILITY OF AMLODIPINE AND RAMIPRIL IN PATIENTS OF STAGE I HYPERTENSION**

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**OBJECTIVES:** To compare the efficacy and tolerability of Amlodipine versus Ramipril in patients of stage I hypertension.

**METHODS:** A 12 week, randomized, open, parallel group study including 50 patients with stage I hypertension was conducted in the department of pharmacology association with medicine department at MMIMSR, Mullana. Patients giving the informed consent and fulfilling the eligibility criteria were randomized to group 1, n=25 (Amlodipine 5-10 mg/day) and group 2, n=25 (Ramipril 2.5-10 mg/day). At baseline, 1 week, 2 weeks, 3 weeks, 4 weeks, 6 weeks, 8 weeks and 12 weeks B.P was recorded. Any adverse drug reactions were inquired, analyzed and recorded at each visit. The difference in B.P reduction in two treatment groups from baseline to 12 weeks was the main outcome measure.

**RESULTS:** Mean supine systolic blood pressure was reduced from 153.04±4.8 to 131.28±5.7 mmHg (amlodipine) and
154.48±3.7 to 133.36±5.7 mmHg (ramipril) after 12 weeks treatment (percentage difference was 14.2%, 13.6%). Mean supine diastolic blood pressure was reduced from 93.68±4.1 to 80.0±1.7 mmHg (amlodipine) and 95.28±3.5 to 80.24±3.8 mmHg (ramipril) after 12 weeks treatment (percentage difference was 14.6%, 15.7%). Mean heart rate was reduced from 83.44±10.5 to 81.52±8.7 beats/min (amlodipine) and 82.4±10.1 to 80.24±8.5 beats/min (ramipril). However there was significant rise in H.R was observed at 3rd and 8th week in amlodipine group (percentage difference 1.5%, 2.4%). Both the drugs were well tolerated.

**CONCLUSION:** Amlodipine and ramipril had similar effects on B.P reduction. However ramipril has more consistent effects on the heart rate reduction than amlodipine.

**PH03PP**

**ROLE OF OXIDATIVE STRESS IN HEPATOTOXICITY CAUSED BY ANTI-TUBERCULAR DRUGS**

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**OBJECTIVES:** The present study was designed to evaluate the comparative status of oxidative stress produced by INH + RMP combination in rat liver and to correlate it with hepatotoxic potential.

**METHODS:** Drugs were powdered and dissolved in normal saline. A drug combination containing INH (125 mg/kg body weight) and RMP (250 mg/kg body weight) was administered i.p. for a period of 4, 8 and 12 consecutive days in three different groups.

In control group rats were treated with normal saline. The liver homogenate and whole blood were analysed for reduced glutathione content and lipid peroxidation. Serum glutamate pyruvate transaminase was monitored as a marker of hepatic injury.

**RESULTS:** Our observations showed 42% decrease in GSH content by INH-RMP treatment in liver. This combination enhanced the lipid peroxidation two to three folds on day 8 and 12 respectively. In blood GSH level decreased by 40 & 80% respectively on day 8 and 12. There was no significant change in the blood level of TBARS in rats for a period of 4 and 8 days. Lipid peroxidation increased by 41% (p<0.001) on day 12. There was significant increase of 1.3 and 2 fold SGPT level when treatment was extended to 8 and 12 days respectively.

There was a good correlation between the status of oxidative stress and the progress of liver injury observed in the rats exposed to INH-RMP combination. These findings suggest that the inhibition of anti oxidant defence mechanism or the enhancement of the deleterious oxidative mechanism, play an important role in the INH-RMP induced hepatotoxicity.

**PH04PP**

**HYPOLIPIDEMIC EFFECT OF PHYLLANTHUS EMBLICA AND TERMINALIA CHEBULA FRUIT EXTRACTS IN RABBIT.**

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**OBJECTIVES:** To evaluate hypolipidaemic effect of *Phyllanthus emblica* and *Terminalia*
Chebulic in normal and hyperlipidaemic rabbits.

**METHODS:** Phyllanthus emblica (Indian gooseberry, Amla) and Terminalia chebula (Myrobalan, Harad) fruit aqueous extract were prepared by standard method. Albino rabbits (2.0 -2.5 kg) of either sex were divided into 3 groups of 6 each. Group I served as control, group II received P. emblica fruit extract 100 mg/kg/day, PO and group III was given T. chebula fruit extract 100 mg/kg/day, PO for 4 weeks. Blood samples were taken from marginal ear vein on day zero and after 4 weeks of treatment. In another series of experiments hyperlipidaemia was produced in rabbits by giving a high fat diet for 10 weeks and the abstracts were administered for 4 weeks; and effect on lipid profile was observed.

**RESULTS:** P. emblica and T. chebula fruit extracts significantly reduced total cholesterol, triglycerides, LDL-C, and VLDL-C in normal as well as hyperlipidaemic rabbits. Hypolipidemic effect of these extracts was more in hyperlipidaemic animals as compared to normal animals.

**CONCLUSION:** P. emblica and T. chebula fruit extracts show significant hypolipidaemic effect in both normal and hyperlipidaemic rabbits.

**PH05PP**

**MANAGEMENT PATTERN OF POISONING CASES IN A TERTIARY CARE CENTER : WHAT CAN BE DONE AT HEALTH CARE AND NATIONAL LEVELS TO IMPROVE OUTCOMES?**

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**OBJECTIVES:** Poisonings and snake bites constitute major healthcare problems worldwide. The severity and outcome in such cases are determined by a variety of factors. The present study was conducted to identify factors associated with fatal outcomes in such cases and to suggest strategies to improve them.

**METHODS:** This was a prospective study conducted in the emergency medicine department of a tertiary care hospital. The study included 102 poisoning and 64 snake bite cases. Data regarding demographics, mode of poisoning, lag time in treatment, first aid, outside and indoor treatment, comorbid illness, duration of hospitalisation and final outcome were collected in a prestructured proforma.

**RESULTS:** The age of the patients ranged from 11 to 68 years and incidence was more common among males (69.9%) compared to females (30.1%). The major types of poisonings included organophosphorus compounds (16.3%), aluminium phosphide (12%), drug overdose (10.8%) and corrosives (6%). There were 18 (18.6%) and 1 (1.6%) deaths in poisoning and snake bite cases, respectively. In poisoning cases, the duration of hospitalisation was significantly decreased if patient received outside treatment (P=0.02) and if he had lesser lag time in reaching the hospital (P=0.009).

**CONCLUSION:** Measures to reduce lag time and provide immediate treatment at initial encounter may be effective in reducing
duration of hospitalisation and possibly mortality in poisoning and snakebite cases.

**PH06PP**

**TO COMPARE THE ANTI INFLAMMATORY EFFECTS OF ATORVASTATIN AND ROSUVASTATIN IN THE PATIENTS OF ACUTE CORONARY SYNDROME**

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**OBJECTIVES:**

- To compare the anti-inflammatory effects of short term therapy (for 1 month) of atorvastatin (40 mg/d) and rosuvastatin (20 mg/d).

- To evaluate the effects of both drugs on recurrent angina, recurrent myocardial infarction, stroke and mortality as secondary outcome measures.

- To evaluate and compare the safety of both drugs (side effects) and compare their lipid lowering capability.

**METHODS:** The study was a prospective, open labeled, randomized and single centre study to compare the anti inflammatory effect of atorvastatin and rosuvastatin in the patients of acute coronary syndrome conducted on 100 patients. The patients were randomized into two groups. The patients were in turn followed up in one month’s time with further investigations and all the results were tabulated. Results were analyzed using different statistical analysis.

**RESULTS:**

- There was significant difference between the levels of CRP in patients of group B (Rosuvastatin) as compared to group A (atorvastatin).

- There was no difference overall with regards to occurrence of all secondary outcome measures in both groups.

- There was no statistically significant difference between the changes in lipid profile and in the incidence of side effects in both groups.

**CONCLUSION:** The study showed that both atorvastatin (40mg) and rosuvastatin (20mg) are effective in decreasing CRP and LDL cholesterol levels even in a short duration of 4 weeks. This dose of rosuvastatin was found to be more effective in decreasing CRP levels. Both the drugs were effective, safe and offer an attractive approach for early treatment of ACS patients.

**PH07PP**

**EFFECT OF METFORMIN ON TSH IN HYPOTHYROID, OBESE WOMEN WITH POLYCYSTIC OVARIAN SYNDROME**

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**OBJECTIVES:** Polycystic ovarian syndrome (PCOS) is the most common gynecological endocrinal disorder and the prevalence of hypothyroidism in PCOS being more than 10% and is subclinical which is diagnosed first time during evaluation of PCOS. If drug used for PCOD has added effect to decrease...
TSH level then would be preferred for patients with PCOD along with hypothyroidism.

The present study was planned primarily to see the effect of metformin on serum TSH, free T3 (FT3), and free T4 (FT4) and secondarily was also to see the effect of metformin on fasting blood glucose (FBG) and total cholesterol levels in hypothyroid, obese women with Polycystic Ovarian Syndrome.

**METHODS:** 50 patients receiving Metformin 1500mg daily for were followed up for a period of 6 months and investigated for the laboratory parameters serum TSH, free T3 (FT3), and free T4 (FT4), fasting blood glucose (FBG) and total cholesterol were done at the start of the therapy and end of 6 months.

**RESULTS:** Metformin caused a significant decrease in TSH level, fasting blood glucose (FBG), triglycerides but total cholesterol, FT3, FT4 levels were not altered.

**CONCLUSION:** Metformin can play a significant role in reducing TSH level in hypothyroid patients with along with the feature of Polycystic Ovarian Syndrome like diabetes, hypercholesterolemia and can reduce the incidence of further complication like metabolic syndrome but more studies need to be conducted.

**PH08PP**

**STUDY ON THE ROLE OF INTERLEUKIN-18 AS BIOMARKER IN CARCINOMA PROSTATE AND BENIGN PROSTATE HYPERPLASIA PATIENTS**

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**OBJECTIVES:** To study the role of serum interleukin (IL) -18 levels in benign and malignant prostate patients.

**METHODS:** The study was conducted on the 90 subjects after approval by the Institutional ethical committee of the King George’s Medical University, Lucknow. The 44 biopsy proven prostate cancer patients and age matched independent 46 benign prostate hyperplasia (BPH) patients as control were selected for the study. The serum samples of both the groups were collected and their prostate specific antigen (PSA) and IL-18 levels were measured by enzyme linked immunosorbent assay (ELISA) technique. All the data were analysed by using one-way ANOVA and a p value of <0.05 was considered significant.

**RESULTS:** The mean IL-18 levels of carcinoma prostate group was found significantly (p<0.01) higher as compared to BPH control group. The PSA levels were also found significantly (P<0.001) higher in prostate cancer group than BPH group. It is also observed that as tumor stage progresses the levels of the PSA and IL-18 increases.

**CONCLUSION:** These findings demonstrate that serum IL-18 may have a role in the pathophysiology of the prostate cancer and can be used as a useful independent diagnostic and prognostic biomarker in patient with prostate carcinoma and IL-18 may be used as a target for new drug discovery and development in the area of prostate cancer research.

**PH09PP**

**EVALUATION OF HEPATOPROTECTIVE ACTIVITY OF ALOE VERA.**
OBJECTIVES: To evaluate the hepatoprotective activity of Aloe vera.

METHODS: Approval from institutional ethics committee was obtained (no. STP/2011/14) and registration under Clinical trial registry india was done (no. CTRI/2011/12/003064). A prospective, randomized, open parallel group study was conducted on patients having acute liver disease and attending out and inpatient department of medicine, SVBP hospital, LL.R.M. Medical College Meerut. Total 110 patients of either sex were selected and divided into two groups. 50 patients were enrolled in control group and were given conventional treatment for acute liver disease while 60 patients were enrolled in treated group and were given conventional treatment for acute liver disease supplemented with Aloe vera juice (Patanjali Ayurved ltd.) in dose of 20 ml BD. Every patient was followed up for 6 weeks and serum Bilirubin, serum ALT (alanine transaminases), serum aspartate transaminase (AST) and serum alkaline phosphatase (ALP) were measured initially and then at the end of 2, 4 and 6 weeks. The levels of these parameters were compared in control and treated groups at all intervals of times. Statistical evaluation is done by applying repeated measure ANOVA and student-t-test.

RESULTS: It was observed that serum bilirubin, S.ALT, S.AST and S.ALP levels of Aloe vera treated group were significantly lower (p<0.001) as compared to that of control group at all intervals of times and reduction was maximum at the end of 6 weeks.

CONCLUSION: Aloe vera is having significant hepatoprotective potential.

PH10PP

COMPARATIVE EFFICACY AND SAFETY OF GLITAZONES AND DPP-4 INHIBITORS AS ADD ON THERAPY IN TYPE 2 DIABETIC PATIENTS

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OBJECTIVES: To compare the efficacy and safety of glitazones and DPP-4 inhibitors in type 2 Diabetic patients as add on therapy, in those patients who has inadequate glycemic control with prior dual combination therapy (Glimepiride + Metformin).

METHODS: Thirty patients (previously known cases of type 2 DM), aged above 18 years, attending medicine OPD of Himalayan Institute of Medical Sciences, Dehradun, over a period of one year were included in the study. The eligible patients based on inclusion and exclusion criteria were divided in two groups of 15 patients in each group: Group A, Glimepiride + Metformin + Pioglitazone (G + M + P) and Group B, Glimepiride + Metformin + Sitagliptin (G + M+ S). The patients were randomly selected, and the study drugs were given on the basis of physician's discretion and the doses of study drugs were fixed according to their clinical presentation at the time of the inclusion in the study. Patients were then followed up for a period of 3 months.

RESULTS: There was significant improvement in both fasting and post-prandial blood sugar
level at the end of study period in both study group, but there was no significant intergroup difference in improvement in blood sugar level.

**CONCLUSION:** There was no significant difference in the efficacy and safety of the combination groups, there was a marked difference in the cost associated with them.

**PH11PP**

**ECONOMIC IMPACT OF ADVERSE DRUG REACTIONS IN CANCER PATIENTS ON CHEMOTHERAPY**

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**OBJECTIVES:** To assess the economic impact of adverse drug reactions (ADRs) on cancer patients by estimating the direct cost involved in treatment and hospitalization of ADRs and indirect cost by loss of work days, secondary to hospitalization.

**METHODS:** An intensive monitoring program was carried out in Department of Radiotherapy and Oncology, Kasturba Hospital, Manipal, a tertiary care hospital in South India. The cost involved in the management of ADRs was assessed by calculating direct cost and indirect cost incurred by the patient. Direct cost included the cost of drugs, syringes, administration, extra nursing and medical care, additional hospital stay and any other additional invasive or noninvasive procedures including laboratory tests. Data pertaining to the cost of extra medications and administration devices was collected from the patient, patient case sheets, nurses and pharmacy, as appropriate. The indirect cost like loss of workdays, travel and stay for the family because of ADR was also calculated.

**RESULTS:** Of the 68 patients who received chemotherapy during June-July 2011, 21 developed ADRs and were followed-up prospectively. The total direct cost involved in the management of ADRs in these patients was Rs.19751. The total indirect cost was Rs. 637 and loss of workdays was 4.

**CONCLUSION:** The present study showed that though cancer patients perceived benefit from their cancer treatment, costs associated with ADRs was unaffordable due to low economic status of the patients. Thus, measures need to be put into place to reduce the burden of ADRs and understand, analyze and reduce the cost associated with ADRs.

**PH12PP**

**PROTECTIVE EFFECT OF ALOE VERA ON GENTAMICIN-INDUCED NEPHROTOXICITY IN RATS.**

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**OBJECTIVES:** The present study was undertaken to evaluate the nephroprotective and curative effect of ethanol extract of leaves of *Aloe Vera barbardensis miller* on gentamicin-induced nephrotoxicity in rats.

**METHODS:** Nephrotoxicity was induced in Wistar rats by intraperitoneal administration of gentamicin 40 mg/kg/d for five days. Effect of concurrent administration of ethanol extract of leaves of *Aloe Vera* at a dose of 2 ml/100gm/d given by oral route was
determined using serum creatinine and serum urea as biochemical indicators and histopathological changes of kidney damage.

Curative effect was tested using same renal damage parameters against the spontaneous reversal of gentamicin toxicity. To evaluate curative effect the ethanol extract of *Aloe Vera* was given after 5 days of gentamicin administration.

**RESULTS:** The study groups contained six rats in each group. The effect was evaluated after 10, 20 and 30 days. Gentamicin-induced glomerular congestion, blood vessel congestion, epithelial desquamation, accumulation of inflammatory cells and necrosis of the kidney cells were found to be reduced in the groups receiving the extract of *Aloe Vera* along with gentamicin. In this group serum creatinine and blood urea nitrogen levels were significantly low (p value <0.001). The nephrotoxicity was inversely related to duration of *Aloe Vera* pre-treatment and relationship was significant (p <0.001).

Curative effect of *Aloe Vera* was not significantly (p value >0.05) different from the spontaneous reversal both for biochemical indicators and histo-pathological changes.

**CONCLUSION:** Our study results showed that the ethanol extract of leaves *Aloe Vera* possessed potent nephroprotective activity.

**PH13PP**

**IMPACT OF ORAL IRON THERAPY ON HAEMATOLOGICAL PARAMETERS IN ANEMIC PATIENTS WITH HEART FAILURE**

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**OBJECTIVES:** To study the effect of iron on haematological parameters and to evaluate the efficacy and safety of oral iron supplementation in patients of anemia associated with heart failure (HF).

**METHODS:** This open labelled study included 60 patients of either sex diagnosed with anemia in HF. Inclusion criteria: Age >18 Years, HF- NYHA Class II and III, LVEF <40, Hb-8-11g/ dl, exercise tolerance (walk distance within 6 min. <375 M) and informed consent. Patients were divided in to 2 groups. Group I- Iron sulphate 100mg, po, bid x3 months was given in anemic patients along with standard treatment for HF. Group II- Anemic patients received only standard treatment for HF. HB, peripheral blood film (PBF), Reticulocyte count, Mean corpuscular volume (MCV), Mean corpuscular haemoglobin (MCH), MCHC, packed cell volume (PCV) and RBC count were estimated by standard method before and after 15, 45 and 90 days of iron treatment. Efficacy and tolerability parameters were assessed in the treated patients.

**RESULTS:** In anemic HF patients, iron supplementation increased Hb, reticulocyte count, MCV, MCH, MCHC, PCV and RBC count while decreased incidence of microcytic hypochromic anemia as compared to control group. Tolerability data showed epigastric pain (10%), heart burn (10%), nausea (13.3%), diarrhoea (6.6%), constipation (26.6%) and metallic taste (13.3%) in patients treated with iron.

**CONCLUSION:** oral iron supplementation in anemic patients with HF is beneficial, well tolerated and safe with minimal side effects.

**PH14PP**
EFFECT OF ORAL IRON THERAPY ON QUALITY OF LIFE IN PATIENTS WITH HEART FAILURE

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OBJECTIVES: Anemia is common in patients with heart failure and is associated with severe symptoms, worse exercise capacity & quality of life. Therefore, present study evaluates effect of oral iron therapy on quality of life in patients with heart failure.

METHODS: This prospective, open labelled study includes 40 patients of either sex, diagnosed with anemia in heart failure (HF). Inclusion criteria- Age >18 Years, HF- NYHA Class II and III, LVEF <40, Hb-6-11g/dl, exercise tolerance (walk distance within 6 min. <375 M) and informed consent. Patients were divided in to 2 groups. Group I- Iron sulphate 100mg, po, bid x3 months was given in anemic patients along with standard treatment for heart failure. Group II - Anemic patients received only standard treatment for HF. Quality of life was measured by Minnesota Living with HF Questionnaire (MLHFQ) before treatment and after 15, 45 & 90 days of iron treatment. Dyspnoea and fatigue were also recorded using Borg scale.

RESULTS: MLHFQ score in group I and group II before treatment was comparable. There was a significant improvement in quality of life (as evident by decrease in MLHFQ score) in HF patients received iron treatment for 90 days as compared to control group. Improved dyspnoea (score decreased) and fatigue (score decreased) was also observed in iron treated patients.


PH15PP

ANALYSIS OF THE COMPOSITION OF SOME COMMONLY AVAILABLE PROBIOTIC BRANDS

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OBJECTIVES: To compare the amount of Lactobacillus sporogenes and Saccharomyces boulardii in various probiotics brands available in market.

METHODS: September 2012 issue of Indian Drug Review and April- June 2012 issue of Drug Today were used to search for common probiotic brands and there composition.

RESULTS: 10 reputed brands (Sporolac, Baclac, Lactisyn, Lactobacil, Bio 4, Cynobac, V I Gut, Baller, SAC, Diacowin) were analyzed. Out of them, 7 have Lactobacillus sporogenes while remaining 3 contains Saccharomyces boulardii (Nonpathogenic yeast). Total no. of Lactobacillus sporogenes spores in Sporolac, Baclac, Lactisyn, Lactobacil, Bio 4, Cynobac, V I Gut, Baller, SAC, Diacowin is 150 million, 60 million, 490 million, 10 million, 50 million, 180 million, 50 million respectively. The amount of Saccharomyces boulardii in Baller, SAC, Diacowin is 282.5 mg, 250 mg, 282.5 mg respectively.

CONCLUSION: The concentration of Lactobacillus sporogenes and Saccharomyces boulardii in these 10 probiotics brands is variable. Attention to be paid while prescribing a probiotic as the concentration varies greatly. More studies are required to standardize the concentration of probiotics in preparations.
PH16PP

GAMMA LINOLENIC ACID PREVENTS STZ INDUCED HYPERALGESIA IN RATS.

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OBJECTIVES: To evaluate antinociceptive effect of gamma-linolenic acid (g-LA) on pain of STZ induced diabetic neuropathy.

METHODS: In albino rats (200-250g) neuropathy was produced by STZ (50mg/kg, ip, single inj.). Nociception was assessed using tail flick test to thermal stimulation by analgesiometer. Heat intensity was adjusted such that the rats had control tail flick latencies of 3 to 5 sec. A 10 sec. cutoff latency was used. Initial reaction time was recorded and animals were divided into 3 groups of 10 each. Group I- control, Group II- STZ (50mg/kg, ip, single inj.). Group III- g-LA (50mg/kg, po, daily, given 7 days prior to STZ & continued for further 12 weeks) + STZ. Reaction time was noted every 30 min. for 3 hr. (every 2 weeks for 12 weeks). Control reaction time was compared with drug treated groups.

RESULTS: STZ diabetic rats exhibited hyperalgesia after 8 weeks of STZ administration. However, delayed hyperalgesia response was noted in animals pretreated with 50 mg/kg, po daily, g-LA. At week 0 reaction time in control rats was mean 4.6 ± 0.18 sec, while after 8 to 10 weeks of STZ, it was significantly reduced. Reaction time was more in animals pretreated with g-LA as compared to rats treated with STZ alone.

CONCLUSION: Preventive study with gamma-linolenic acid showed that g- LA is beneficial in antagonizing pain of diabetic neuropathy.

PH17PP

INFLUENCE OF LORNOXICAM ON PAIN, PULSE RATE, BLOOD PRESSURE AND GLOBAL IMPRESSION IN THE TREATMENT OF RENAL COLIC

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OBJECTIVES: Lornoxicam is a currently prescribed nonsteroidal anti-inflammatory for the management of surgical pain. The purpose of the present study was to find out the influence of lornoxicam on pain, pulse rate, BP and global impression in the treatment of renal colic.

METHODS: Forty patients with acute renal colic presenting in Casualty & Emergency ward of Pt. B.D. Sharma PGIMS hospital, Rohtak were assigned to receive single injection of lornoxicam 8mg i.m. Pain assessment, pulse rate and BP were recorded at 0, 15, 30, 60, 180min and 5 h after injections of lornoxicam. After complete relief from acute renal pain, patients and treating physicians were asked to give their opinion regarding the efficacy and tolerability of lornoxicam.

RESULTS: A significant reduction in pain was observed in all patients with lornoxicam while pulse rate and BP were not affected. Global impression regarding the efficacy of lornoxicam was satisfactory as reported by patients and physicians.
CONCLUSION: Lornoxicam exerted major benefit in reducing pain without affecting pulse rate and BP in renal colic and both patients as well as treating physicians found the drug very effective.

PH18PP

ROLE OF ZOLEDRONIC ACID AS AN ADJUVANT THERAPY IN EARLY BREAST CANCER: A META-ANALYSIS

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OBJECTIVES: Zoledronic acid (ZOL), a bisphosphonate has been in common use for the treatment of osteoporosis. Recently it has being in use as an adjuvant with chemotherapy for the treatment of early breast cancer. However, the finding regarding the efficacy of ZOL has been inconsistent in different clinical trials. A meta-analysis was performed to evaluate the effects of zoledronic acid on disease-free survival (DFS) and prevention of bone loss related to chemotherapy.

METHODS: Six randomized controlled trials on patients with early breast cancer receiving ZOL as an adjuvant treatment and met the laid down criteria were considered for the meta-analysis. Pooled data of 2504 subjects randomized to treatment with ZOL (1364) either placebo or no treatment (1140). The primary study end-points were the DFS as well as prevention of bone loss related to chemotherapy.

RESULTS: The meta-analysis showed that disease-free survival in ZOL group is 77.4% as compared to 64.9% in control group (p<0.01). There is also an improvement in bone mineral density (BMD) in ZOL group as compared to control group i.e +3.42% Vs -2.71%. Results of meta-analysis indicating that ZOL may have anti-tumor effect. There is also improvement in BMD which is already an already established effect of ZOL.

CONCLUSION: Results of meta-analysis demonstrate that ZOL may have a specific anti-tumor effect along with the improvement in BMD and may be of value in patients with early stage breast cancer receiving cancer chemotherapy.

PH19PP

EVALUATION OF ANTIDEPRESSANT EFFECT OF GABAPENTIN ALONE AND IN COMBINATION WITH FLUOXETINE IN ALBINO MICE

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OBJECTIVES: Evaluation of antidepressant effect of gabapentin alone and in combination with fluoxetine in albino mice.

METHODS: The study was carried out in 24 male albino mice divided in four groups. Distilled water, fluoxetine (7mg/kg), gabapentin (200mg/kg) and a combination of gabapentin and fluoxetine were administered orally in different groups. Antidepressant activity was assessed using standardized behavioral animal models, forced swim test (FST) and tail suspension test (TST) and immobility time was recorded and compared in different groups.

RESULTS: Fluoxetine showed a significant reduction in immobility time in both FST and TST (p value 0.000) exhibiting its antidepressant effect. A significant increase in duration of immobility in FST (p value 0.005)
was observed with gabapentin. Similar observation was seen in TST (p value 0.001) with gabapentin indicate that it accentuates depression. The combination of fluoxetine and gabapentin did not significantly change immobility time indicating that antidepressant effect of fluoxetine was masked by gabapentin.

**CONCLUSION:** Gabapentin may cause depressant effect when administered in high doses and given along with fluoxetine can mask its antidepressant effect. The caution may be warranted with use of gabapentin in epileptic patients especially those with depression.

**PH20PP**

**ANTI-EPILEPTIC ACTIVITY OF WITHANIA SOMNIFERA AND CYPERUS ROTUNDUS EXTRACTS IN RATS.**

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**OBJECTIVES:** To evaluate effect of Withania somnifera and Cyperus rotundus extracts (aqueous and alcoholic) on audiogenic seizures in rats.

**METHODS:** Technoaudiogenic chamber was used to produce seizures. Initially rats were subjected to audiogenic stimulus and time to appear convulsions was noted for each animal. Rats showing convulsions were selected. Albino rats (weighing 125-150 g) of either sex were divided into 5 groups of 10 each. Gp I received aq. extract of W. somnifera (100mg/kg) P.O; Gp II received alcoholic extract of W. somnifera (100 mg/kg) P.O; Gp III received aq. extract of Cyperus rotundus (200 mg / Kg) P.O; Gp IV received alcoholic extract of Cyperus rotundus (200 mg / kg) P.O; Gp V received Phenytoin (200 mg / Kg) P.O, as standard for comparison.

**RESULTS:** Both aqueous extract of W. somnifera and Cyperus rotundus protected the rats against audiogenic seizures. On the other hand, alcoholic extract of W. somnifera possessed protective effect in this test model, while alcoholic extract of Cyperus rotundus failed to produce any protection in rats against audiogenic seizures.

**CONCLUSION:** Aqueous and alcoholic extract of W. somnifera and aqueous extract of Cyperus rotundus protect the rats against the audiogenic seizures.

**PH21PP**

**ANOREXIA IN CONCURRENT CHEMORADIATION PATIENTS: CAN OLANZAPINE CALM DOWN THE MONSTER?**

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**OBJECTIVES:** To find out the role of olanzapine in anorexia following concurrent chemo-radiation.

**METHODS:** This prospective, randomized, controlled, open label study enrolled total 50 chemotherapy naïve patients undergoing concurrent chemotherapy and radiation for treatment of cancer. Patients were divided into test group and the control group comprising 25 patients each, using web based randomization. Both the groups received prophylactic antiemetics, palonosetron plus dexamethasone and pantoprazole 40 mg intravenously 30 minutes before start of
chemotherapy as per protocol. Pantoprazole was continued orally for the next 10 days. The test group, in addition, received olanzapine 10 mg orally for 5 days from day 1. Patients were assessed for anorexia using a four point categorical scale (1-4) on day 1 and day 10. Higher score was suggestive of more anorexia. Anorexia was compared within the groups and in between groups before and after chemotherapy. Results were analysed statistically, $p$ value less than 0.05 was considered statistically significant.

**RESULTS:** The baseline demographic criteria and appetite scores were comparable in both groups. Anorexia was noted after chemoradiation in both the groups; however the incidence in the control group was statistically significant over the baseline value ($p < 0.001$). Increase in anorexia score implying more anorexia was found in 12% (n=3) in olanzapine group compared to 60% (n=15) patients in the control ($p=0.0004$). In fact, in two patients (8%) in the olanzapine group anorexia score was reduced.

**CONCLUSIONS:** In this study, olanzapine was found to protect from anorexia after chemoradiation.

**Keywords:** Cancer, Chemotherapy, anorexia, appetite, olanzapine

**PH22PP**

**A COMPARATIVE STUDY OF DRUG PRESCRIBING PATTERN IN RHEUMATOID ARTHRITIS PATIENTS IN A TERTIARY CARE HOSPITAL**

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**OBJECTIVES:** To compare the drug prescribing pattern in Rheumatoid Arthritis patients attending General Medicine OPD and Immunology OPD.

**METHODS:** This prospective study was conducted on 100 consenting Rheumatoid Arthritis patients (50, each from General Medicine OPD (gp 1) & Immunology OPD (gp 2) at Dayanand Medical College & Hospital, Ludhiana. Prescriptions of all the patients were recorded on individual proforma, pooled and analyzed.

**RESULTS:** All the prescriptions were legible and 100% complete as per prescription writing guidelines. The median age in gp1 was 55 yrs and 50 yrs in gp 2. The average number of drugs per prescription in gp1 & gp2 were 6.9 and 6.28 respectively. The drugs included NSAIDs (13.04%, 16.24%), Glucocorticoids (12.75%, 12.10%), Methotrexate (12.46%, 13.38%), Hydroxychloroquine (8.98%, 6.69%), Leflunomide (2.89%, 3.82%), Sulfasalazine (2.32%, 0.64%); drugs for co-morbid conditions (11.01%, 12.10%); Antiulcer drugs (8.98%, 3.5%) and Nutritional supplements (27.54%, 31.21%) respectively in group1 and 2. Fixed dose combinations accounted for 20.58% & 21.62% in gp 1 & 2. The route of administration for prescribed drugs by oral route was 99.55% (gp 1) and 98.65% (gp 2). None of the prescriptions had drug incompatibilities.

**CONCLUSION:** The treatment was started by NSAIDS and Glucocorticoids in both the groups and among DMARDs the preferred were Methotrexate > Hydroxychloroquine > Leflunomide > Sulfasalazine. Nearly half of the patients in both the groups were co-prescribed PPI with NSAIDS. Nutritional supplements were very commonly used. There is not much difference in the
prescribing pattern in General Medicine OPD and Immunology OPD.

**PH23PP**

**WHAT'S THE CORRECT DOSING OF BETA BLOCKERS IN HEART FAILURE?**

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**OBJECTIVES:** Western studies have shown that Beta blockers given in higher doses confer additional mortality benefit compared to lower doses. Similar benefit have not been shown in Indian patients who don't seem to tolerate higher dose of beta blocker that well. To determine the role of beta blocker dose in prognosis in heart failure we compared the dose of beta blocker with parameters of clinical and prognostic importance.

**METHODS:** Heart failure patients with LV systolic dysfunction (male 50%, mean age : 41.5 + 11.0 years and mean EF : 26.35 % + 8.70 ),who were on maximum tolerated beta blocker dose ( mean 18.6 + 4.5 mg carvidilol equivalent) were taken .The beta blocker dose was compared with ejection fraction, left ventricular dimensions, parameters of functional capacity , hemodynamic profile and with dose of ACE inhibitors

**RESULTS:** Compared to those on upper quartile, patients from lower quartile range of beta blockers dosage had a lower ejection fraction (20% vs 30%) and where on lower dose of ACE inhibitors (4.5 mg vs 7.5 mg Ramipril equivalent). The hemodynamic and functional capacity was similar in patients in upper and lower quartile. Majority of patients on a high dose of beta blockers were also on a high dose of ace inhibitors.

**CONCLUSION:** Indian patients tolerating higher doses of beta blockers have relatively better ejection fractions and also tolerate higher doses of ACE inhibitors though they are otherwise as sick as the patients who tolerate lower doses of beta blockers

**PH24PP**

**PROPRANOLOL IN INFANTS WITH VENTRICULAR SEPTAL DEFECT WITH HEART FAILURE**

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**OBJECTIVES:** Beta-blockers have an established role in adult with heart failure. There is paucity of literature on its usage and efficacy in infants with ventricular septal defect (VSD) with heart failure.

**METHODS:** A single centre, randomized, open label trial of propranolol added to conventional treatment as compared to conventional treatment alone . 80 patients were enrolled; 40 each group.. Median follow up was 7 months (range=1-32 months). Primary end point, a composite end point of death, hospitalization or referral for surgery, occurred in 14 [35%] patients in Group I (controls) and 10 [25%] patients in Group II ( ß-blocker) (p = 0.32).

**RESULTS:** Worsening of heart failure occurred in 11 patients in the Group I and 2 patients in Group II [27.5% and 5% respectively; p = 0.015]. Other secondary end points , death occurred in 2 patients in Group I & 1 patient in Group II, hospitalization occurred in 3 & 2 patients respectively; referral for surgery in 11 & 9 patients (p=NS). Safety end point of
bradycardia, bronchospasm or worsening of heart failure was observed in 12 and 3 patient in control and β-blocker group respectively (p = 0.01).

CONCLUSION: β-blockers were well tolerated by the infants with VSD with heart failure. Significant reduction was noted in worsening of heart failure by propranolol, with no effect on reduction in mortality, hospitalization or referral for surgery.

PH25PP

AN OVERVIEW OF DEVELOPMENT OF DIAGNOSTIC PLAN FOR PMS

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OBJECTIVES: Premenstrual syndrome (PMS) is a psychoneuroendocrine disorder of unknown etiology. It is characterised by a large number of symptom constellation with various characteristic pattern of appearance & disappearance. The Luteal phase symptom pattern of sufficient severity is the mainstay for diagnosing this condition & needs to be confirmed by prospective charting. Variety of tools with different rating scales & criteria are available for this purpose. The article reviews these tools & criterias to reach a consensus statement for diagnosis of PMS.

METHODS: Computer & manual search of drug trials in PMS was done. The questionnaires & scales cited in different trials were retrieved & compared to study their strengths & limitations. Numerous tools available for prospective rating and charting of symptoms were analysed to study their role in diagnosing PMS.

OBSERVATIONS: The shifting of emphasis from type of symptoms to change in symptom severity in relation to menstrual cycle phases was observed. National Institute of Mental Health (NIMH) guidelines require at least 30% increase in symptom severity from proliferative to luteal phase and documentation of this change in at least two successive menstrual cycles for making a diagnosis of PMS. Though all researchers agree on recording change in symptom severity with menstrual cycle phases by prospective charting as an essential step in diagnosing PMS but, there is no consensus regarding the first choice instrument for prospective charting & rating of symptoms.

CONCLUSION: Despite differences in tools or scales used for diagnosis of PMS, the underlying methodology remains the same which stresses on 3 key elements for diagnosis viz 1) symptom group consistent with diagnosis 2) luteal phase pattern 3) severity enough to interfere with normal activity. Lack of any of above 3 key elements is considered sufficient to rule out PMS.

KEYWORDS: Premenstrual syndrome, Luteal phase pattern, Criteria, Tools.

PH26PP

RATIONALITY OF PERIOPERATIVE ANTIBIOTIC PROPHYLAXIS IN ELECTIVE LAPAROSCOPIC CHOLECYSTECTOMY

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OBJECTIVES: To investigate and analyze the rationality of perioperative antibiotic use in elective laparoscopic cholecystectomy
METHODS: A retrospective study was done in 220 patients who had undergone elective laparoscopic cholecystectomy from January 2011 to December 2011 in a tertiary care hospital in North India. Data was collected from medical record department and analyzed statistically to evaluate the rationality of antibiotic use.

RESULTS: Preoperative antibiotic was given to 113 (51.4%) patients, out of which 50 (44.2%) patients received antibiotic just before shifting to operation theatre, 50 (44.2%) patients half an hour before surgery and 13 (11.5%) patients 1 hour before surgery. 100 patients (88.4%) out of 113 received single antibiotic and 13 patients (11.5%) received double antibiotic preoperatively. A total of 217 patients (98.6%) received antibiotic postoperatively. Duration of treatment was 2 days in 72 patients (33.1%), 3 days in 71 patients (32.7%), 4 days in 30 patients (13.8%) and 5 or more days in 44 patients (20.2%). Single antibiotic was used postoperatively in 200 patients (92.2%), double antibiotic in 10 patients (4.6%) and 3 or more antibiotic in 7 patients (3.2%). The choice of antibiotic was same in preoperative and postoperative period. The first choice was Cefuroxime with Sulbactam and second choice was ceftriaxone with Sulbactam. Out of 220 patients undergoing elective laparoscopic cholecystectomy the procedure was changed to open cholecystectomy in 7 patients, so the antibiotic use is rational in 7 patients (3.1%) and irrational in 213 patients (96.8%).

CONCLUSION: The prophylactic use of antimicrobial in laparoscopic cholecystectomy patients is quite irrational which must be controlled to prevent the emergence of resistant strains, decrease the adverse effects and cost of health care services.

Keywords: Scottish Inercollegiate guidelines network (SIGN), Prophylactic, Laparoscopic cholecystectomy.

PH27PP

EFFECTS OF ANTIPILEPTIC DRUGS ON LIPID PROFILE OF EPILEPTIC PATIENTS

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OBJECTIVES: Epilepsy is a chronic disorder requiring long-term therapy with antiepileptic drugs. Antiepileptic drugs may induce hyperlipidemia, thus predisposing the patient to higher cardiovascular risk. Many new drugs having antiseizure activity are available hence the effects of old and new antiepileptic drugs on various parameters of lipid profile were evaluated. The aim of the study was to evaluate the effects of: Phenytoin, Carbamazepine, Oxcarbazepine (enzyme inducing drugs) & Levetiracetam, Topiramate, Lamotrigine (non enzyme inducing drugs) on lipid profile of epileptic patients

METHODS: 60 newly diagnosed epileptic patients were divided into 6 groups of 10 each. Therapy was started with any one of the above antiepileptic drugs. The complete lipid profile of the patients at baseline, 3 months and 6 months was compared using t-paired test to see the effect of drugs on total lipids, cholesterol, TG, HDL, LDL & VLDL.
RESULTS: The phenytoin group showed no significant increase in the mean levels of total lipids, total cholesterol, TG, HDL, LDL and VLDL at 3 & 6 months from baseline. Only one patient had significant increase in LDL-cholesterol levels. Carbamazepine group showed a statistically significant increase in total lipids (p=0.0233) and total cholesterol (p = 0.0443) at 6 months as compared to baseline. Oxcarbazepine group showed an increase in mean levels of HDL-cholesterol but it was statistically not significant. Out of non enzyme inducing drugs, Levetiracetam group showed a non significant increase in triglyceride levels. There was no change in any parameter in Lamotrigine and Topiramate groups.

CONCLUSION: The non enzyme inducing drugs seem to have some advantage over the microsomal enzyme inducers by not affecting the lipid profile adversely. Though the microsomal enzyme inducing drug carbamazepine caused statistically significant increase in lipid profile parameters, but it was not clinically significant as derangement in lipid profile did not result in discontinuation of therapy in any of the patients.

PH28PP

TO KNOW AWARENESS REGARDING JAPANESE ENCEPHALITIS AMONG PHARMACY STUDENTS

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OBJECTIVES: To know awareness regarding Japanese encephalitis among pharmacy students.

METHODS: A prospective survey was conducted in the Deptt. of Pharmacy, Pt. B.D Sharma University of health sciences Rohtak using a structured questionnaire (1-12) regarding .What is Japanese encephalitis? What is the name of causative organism? What is the mode of transmission? Natural host of Japanese encephalitis virus. What are the signs & symptoms? How is can be diagnosed and prevented?

RESULTS: A total of 120 under graduate students were included. Most of (65%) the students knew about Japanese encephalitis. 40% students have no knowledge about causative organism. Out of 120 students 55% were unaware about the mode of transmission. 60% students had knowledge about the natural host of Japanese encephalitis virus. 45% students had no knowledge about the signs & symptoms of Japanese encephalitis.65% students had no knowledge about in which part of the world it occurs mainly. 50% students did not know whether the patient should be isolated or not.60% students did not know about its prevention.

CONCLUSION: More awareness is required among students regarding Japanese encephalitis.

PH29PP

PHARMACODYNAMIC INTERACTION OF INHALED Budesonide WITH SALMETROL ON ATTENUATION OF EXERCISE INDUCED BRONCHOCONSTRICTION IN ASTHMA PATIENTS

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OBJECTIVE: To study Pharmacodynamic interaction of inhaled budesonide with chronic salmeterol inhalation on attenuation of exercise induced bronchoconstriction

METHODS: Design: Controlled, randomized, single blind, parallel group, add on study.

Inclusion: 50 asthma patients, attending outpatient department of medicine with a history of exercise induced bronchoconstriction, diagnosed by American Thoracic Society Criteria were included and stabilized on inhaled salmetrol.

Exclusion: major systemic disease, exacerbation during last thirty days, contraindication to trial medication or pregnancy.

Treatment: Group A received salmetrol, Group B salmetrol and budesonide (n=20 each) and Group C (n=10) kept as control.

Parameters: Resting and post-exercise FEV₁ at 4 and 6hrs were recorded 1st and 28th day.

Exercise: On bicycle ergometer was performed for six minutes with speed and weights adjusted to reach heart rate of 85% predicted value.

RESULTS: On day 1, Post exercise decrease (PED) in FEV₁ at 4 hours was 33.49 % (Placebo), 9.11% (salmeterol) 9.11% (salmeterol plus budesonide) and at 6 hours was 26.32% (placebo) 11.66(salmeterol) and 11.57% (salmeterol plus budesonide).

On day 28, PED in FEV₁ at 4 hours was 30.95 % (Placebo), 24.69% (Salmeterol) and 18.78% (salmeterol plus budesonide); and at 6 hours was 28.91% (placebo), 21.76 % (salmeterol) and 15.17% (salmeterol plus budesonide). Protection with salmeterol plus budesonide treatment was more (p<0.05) than placebo.

CONCLUSION: Tachyphylaxis develops to the protective effect of salmeterol alone against exercise induced bronchoconstriction. Effect of treatment with budesonide and salmetrol given together is maintained on regular use for 28 days.

PH30PP

EVALUATION OF PATIENT SATISFACTION IN OUTPATIENT PHARMACY IN TERTIARY CARE HOSPITAL

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OBJECTIVES: To establish the level of satisfaction with the services received by patients in the outpatient pharmacy in tertiary care hospital.

METHODS: A cross sectional survey of 100 patients attending the outpatient pharmacy attached with tertiary care hospital. A self-completion questionnaire that employed a Likert-type 3 point ordinal scale (1: Unsatisfied, 2: Satisfied and 3: Not Sure) was used.

RESULTS: Approximately 66% felt they had to wait a long time (average time to dispense was 19 minutes per person).48% patient felt that the dispensing area and waiting area is not adequate. Nearly half of the patient were satisfied with the personal skills (being friendly and explaining how to take medicine) of pharmacist however they felt time spent with each patient was not sufficient (48% were not satisfied). 83% were not satisfied regarding the information asked to pharmacist on dispensed medication .60% were satisfied for the availability of
prescribed medicines. Only 34% patient got the bill & according to 53% cost of medication was unsatisfactory. 90% of patient feel that there is a need to improve pharmacy services, only 34% patients were satisfied with the overall services provided by pharmacy.

**CONCLUSION:** This study shows low level of satisfaction with the current pharmaceutical services at the study hospital. There is need to increase patient–dispenser ratio for provision of medication advise to patient and to cut short dispensing time.

**PH31PP**

**IMPACT OF PRESCRIPTION AUDIT AND MONITORING ON COST OF TREATMENT IN A TERTIARY CARE HOSPITAL**

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**OBJECTIVES:** To find effect of training and monitoring on prescription cost, number of drugs prescribed and comprehension of treatment schedule by the patients.

**METHODS:** Prescriptions of 106 patients attending the medical outpatient department of a tertiary care hospital were audited. These were analyzed for total number of drugs prescribed, cost, prescription by generics, and comprehension of treatment schedule by the patient. All prescribers were informed that prescriptions will be randomly picked up and scrutinized. The audit was repeated after conducting training programs for rational drug use and essential drug list.

**RESULTS:** The mean cost of treatment was Rs. 75 per day, number of drugs prescribed were (6.8 drug per prescription), all prescription were by brand name and 25% patients could explain the schedule of prescribed drugs. After training and monitoring cost of treatment was Rs.58 per day, number of drugs prescribed per prescription was 5.3, none of prescription was by generic name and 34% patient could comprehend the treatment schedule.

**CONCLUSION:** There was a reduction in cost of treatment (Rs. 75 vs Rs58 per day). A trend showed that fewer drugs were prescribed (6.8 vs 5.3 drugs per prescriptions) and better comprehension of treatment schedule by the patients (25% 34%). There was no effect on prescription by brand names. Patients also need to be educated on method of using the drugs. There is need for continuous education, monitoring and feedback to prescribers.

**PH32PP**

**AQUEOUS LEAF EXTRACT OF AEGLE MARMELOS (L.) CORREA AMELIORATES FRUCTOSE INDUCED METABOLIC SYNDROME IN RATS**

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**OBJECTIVES:** Metabolic Syndrome (MS) has been defined as constellation of pathologic states including atherogenic dyslipidemia, elevated blood glucose associated with insulin resistance. One of the factors responsible for MS is excessive consumption of fructose. Despite its global incidence at epidemic scale, there is no pharmacotherapy for MS and this study was designed to address this lacuna.
**METHODS:** Over a study period of 8 weeks, fructose (15% w/v) was provided as drinking solution, ad libitum to Wistar albino rats to develop paradigms of MS. Against this challenge, aqueous extract (AML) of leaves of Aegle marmelos (L.) Correa (Family-Rutaceae) was orally administered to animals in the treatment arm at the doses of 250, 500 or 750 mg/kg/d.

**RESULTS:** Reduction in fructose intake, weight gain, fasting blood sugar, insulin levels, serum cholesterol levels, mean arterial blood pressure was recorded following AML treatment. Concomitantly, basal metabolic rate (rectal temperature) and sensory fiber dysfunction (pain threshold) were elevated. In addition, AML treatment reduced the levels of the markers of oxidative stress (Malondialdehyde) and inflammation (Tumor Necrosis Factor-α, Interleukin-6). Histopathological evaluation of the liver revealed marked attenuation of changes associated with pathogenesis of fatty liver in AML treated animals.

**CONCLUSION:** Aqueous leaf extract of Amarmelos holds potential in ameliorating the condition of fructose induced-MS.

**PH33PP**

**A STUDY OF PRESCRIBING PATTERN FOR RATIONAL DRUG THERAPY IN PRACTICE**  
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**OBJECTIVES:** Prescription writing is a science and mindful art, as it conveys the message from the prescriber to the patient. The objective of the present study was to evaluate the prescriptions for adherence to prescription format and rationality of prescription.

**METHODS:** Prescription analysis exercise was given to MBBS 2nd professional students of GMC, Patiala. Each student collected a prescription and evaluated it for rationality of prescription as well as for adherence to prescription format. Total 136 prescriptions were collected. All data was filled in Microsoft Excel 2007 and analyzed.

**RESULTS:** Results obtained after analyzing prescriptions for prescription format indicate that majority of the prescriptions do not adhere to the ideal pattern of prescription writing. Name, age address was written in 97.79%, 89.70%, and 16.91% of the prescriptions respectively. Route of drug administration, and dose strength were mentioned in 72.79% of prescriptions respectively. Total duration of therapy was not mentioned in 30.89% of prescriptions, hence the quantity of drug to be dispensed was not known.

Second component of study was evaluation of prescriptions for rationality. Average number of drugs prescribed per prescription was 3.7. Only 6.5% drugs were prescribed under generic name. Fixed dose combinations were used in 68.38% of prescriptions. However no banned drugs were prescribed in the prescriptions under study.

**CONCLUSION:** Irrational prescribing can be avoided by sticking to the ideal prescription writing. This study revealed that there is lot of scope to prescriber education to improve prescribing patterns.

**PH34PP**

**PERCEPTION OF DOCTORS REGARDING ADVERSE DRUG REACTIONS**  
**Dr. Neha Bhati*, Dr. Surabhi Gupta, Dr. H.L.Bhalla, Dr. Ramgopal, Dr. P.P. Khosla**
OBJECTIVES: Adverse drug reactions is an important cause for hospitalization and for morbidities and mortality. Unfortunately, it is widely under reported in our country, hence it is essential to analyse the causes of under reporting. This study was done to assess the perception of doctors regarding adverse drug reaction reporting.

METHODS: A questionnaire based on the knowledge, attitude and practice of physicians regarding adverse drug reaction was developed. It was solved by around 100 health care professionals which included consultants, senior residents, junior residents and interns. The questionnaires were evaluated and analysed and the results were expressed in percentage.

OBSERVATIONS: 97% of doctors were not aware of adverse drug reaction forms according to causality, severity, seriousness and preventability assessment. 68% of doctors were not aware of CDSCO form. 78% of doctors were not informed by the medical representatives about the effect of adverse drug reactions on pregnant women, lactating women and children. 81% of doctors admitted that new drug would not be safe and free from adverse drug reactions. 62% of doctors were not afraid of litigation/ trouble/financial loss if they would report an adverse drug reaction.

CONCLUSION: There is need for intensive training on basic elements of adverse drug reaction reporting and to sensitize the physicians on importance of adverse drug reaction reporting.

PH35PP

TO EVALUATE RATIONAL AND IRRATIONAL FIXED DRUG COMBINATIONS IN PRESCRIPTION ORDERS OF CLINICIANS IN CSSH, MEERUT

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OBJECTIVES: To find out the rational and irrational Fixed Drug Combinations in prescription orders of clinicians in CSSH, Meerut, U.P.

METHODS: This study was conducted by Department of Pharmacology, Subharti Medical College, Meerut from Sept. 2012 to Oct. 2012. During this period the details of irrational fixed drug combinations were collected from both in and out patients’ prescriptions.

RESULTS: a total of 380 prescriptions were collected in which 234 (61.6%) fixed drug combinations were identified. Among them 97(41.5%) fixed drug combinations were found to be irrational and 137(58.5%) combinations were found to be rational.

CONCLUSION: The recent 14th model list of essential drugs prepared by WHO (March 2005) includes 312 formulations of which 18 are fixed drug combinations. Unfortunately many FDCs introduced in India are irrational. Strict regulations are required to ban irrational FDCs and allow only WHO approved combinations in the market.

PH36PP

AN INDIGENOUS DEVICE TO GIVE VOLATILE ANESTHESIA TO RATS.

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**OBJECTIVES:** Using an indigenous and economic device for administration of inhalational volatile liquid anesthesia in rats.

**METHODS:** A small aeration device (air pump used for providing air for stirring the organ bath), 10 ml measuring cylinder (narrow and long) for putting halothane fitted with a cork with wholes for inlet of air, putting halothane and for outlet for vapors of halothane; glass container with a lid to put in and remove animal; glass manometer and connecting tubes oxygen cylinder and screw cork for regulating flow. Air from the pump was passed through halothane at a regulated rate that delivered anesthetic vapors to the rat in container. Oxygen was administered through a tube. The container was constantly rotated so that rat will fall down when anesthetized. Anesthesia was stopped 8 seconds after this and rat was taken out of glass container. Reading for induction time (loss of righting reflex) and volume of halothane used were recorded by subtracting final reading from initial reading.

**RESULTS:** The average time taken for loss of righting reflex was 2 minutes 1 seconds, volume of halothane used was 0.19 ml, pressure gradient for controlling rate of bubbles of air was 8 mm of water, recovery time 1 minute 10 seconds (animal was able to walk again) recovery occurred in all the animals.

**CONCLUSION:** A safe and economic device fabricated from the materials available locally was able to provide anesthesia to the rats using inhalation of vapors of liquid halothane. Further improvement is needed to include more parameters.

**PH37PP**

**FORMalin INDUCED TONIC PAIN IN NORMAL, OBESE, DIABETIC AND DIABETIC OBESE RABBITS**

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**OBJECTIVES:** Formalin induced tonic pain is a popular experimental model for inducing pain in animals including rabbits. The present study was taken up to observe whether, obesity, diabetes and obesity with diabetes can alter tonic pain.

**METHODS:** Rabbits were divided into four groups; 1-normal, 2-obese, 3-diabetes and 4-diabetes with obesity. Each group had 6 rabbits. Diabetes was induced with dithizone and obesity was induced with high fat diet. For making obese diabetics, dithizone was given to obese animal. All rabbits were given formalin (5%) 0.1 ml subcutaneously in right hind paw to induce tonic pain. Pain behavior was observed on 4 points scale 0=animal shows no response, 1= limping/light putting of paw on table, 2= lifting of paw and 3= biting/licking the paw.

**RESULTS:** Pain responses to formalin test were comparable in normal and dithizone-induced diabetic rabbits. Rabbits, which were obese and obese plus diabetic, showed significantly less pain responses to formalin test compared to normal and diabetic rabbits.

**CONCLUSION:** Obese and diabetic obese animals were less responsive to formalin-induced tonic pain as compared to normal and diabetic animals.
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