CME-01 INNOVATIVE METHODS FOR MEDICAL EDUCATION IN INDIA
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There is considerable uncertainty about the undergraduate medical education in India and facing important challenges. The Medical Council of India has drastically reduced the time period for the preclinical subjects; in contrast there is an exponential growth of these subjects over the years. Further, new domains of knowledge such as molecular medicine, genetics, information technology, complimentary and palliative medicine, medical ethics, disaster management and environmental sciences are emerging as separate subjects. The understanding of these areas are very much essential for the current situation. The exclusion of the above areas of science in medical education produces an incomplete physician. The curriculum is already packed and no one is ready to yield. Although it is not practical to add new courses or subjects, yet there is a need for a change. For example, the growth of genetics and genetic engineering have revolutionized the treatment protocols. It is not essential then to impart appropriate knowledge of genetics to the undergraduates? Another important area is the expansion and intrusion of Information Technology in all domains of science and the medical science is no exception to it. Thus it is another big challenge that demands the solution. The medical colleges at present do not stress on the information technology either in the class room or non-class room environment. The information technology will have big impact on the teaching and learning processes of medical students. The physician of 2020 is going to use more computer technology, genetics knowledge, or molecular biology than the physician of 2000. We have to train our students in teaching learning methods in these newer areas. This is the need of the hour and can be achieved by self directed learning.

CME-02 Mul-ti-disciplinary and Multi-modal education for Medical Science and Technology
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Medical science is advancing very rapidly, especially with the unexpected progress of technology, both related and unrelated to the healthcare delivery field directly.

Not very long back (many of the senior Professors here will recall), Biochemistry was accepted as a part of Physiology. Now the MCI is including Biophysics within Physiology. May be within a few years, Biophysics as a separate subject, will have its own standing in the Medical curriculum. Similarly, you can see that abroad, a person may be Professor in Physiology and Biomedical Engineering; or Biomedical Engineering and Anesthesiology; or even Medicine, Pathology and Pharmacology together. These are the pioneers who have actually advanced our understanding (Arthur C Gupton and William F Ganong are two notable examples).

Why is multidisciplinary interaction at all necessary? Is it just a fancy or buzz word? Certainly not! If we take a look at a novel diagnostic technique (EEG or electrogastrography), the two leading groups (McCallum and Chen; Mintchev and Bowes), have as core faculty one (electrical) engineer (Chen and Mintchev) and either a physiologist (McCallum) or surgeon(Bowes).

Bioengineering essentially consists of two wings: Biotechnology and Biomedical Engineering (computers and instruments related to healthcare). Broadly speaking, Medical Informatics is nothing but the science and art of processing (bio)medical information (where information is the processed data). EBM (Evidence Based Medicine) is gradually becoming popular for managing both common and uncommon
medical problems. In this age of "Information Explosion" choosing the useful one is rather difficult, and that brings in the scope of data management and research. The usefulness of a database can be assessed only by its proper management (building, indexing and updating). However, still many outstanding personnel related to the healthcare sector take pride in being "computer illiterate". The onus of the best use lies on the end-user health care providers only. The importance of clinical informatics is no less. Another term e-health encompasses all the tele-health services.

Multimedia interaction including Medical Simulation using Virtual Reality is now becoming a powerful tool for education related to medical science and technology. CDSS (Clinical or Diagnostic Decision Support System) are Interactive computer programs, which directly assist physicians and other health professionals with decision making tasks. I have the pleasure of developing some CDSS. Nevertheless, for computer-assisted diagnostic system, a human clinician ("man in the loop") must be a necessary component. However, with sophisticated gadgetry taking the upper hand, the "human touch" should not be overlooked or forgotten.

CME-03 PRECLINICAL TEACHING AND MEDICAL EDUCATION IN INDIA

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As per the National Health Policy for Medical and Health Personnel Education, a health professional should possess various grades of skills and competence, who is professionally equipped and socially motivated to deal effectively with day-to-day problems. Looking at the today's Medical Graduate it is heartening to note that we are nowhere near our National Objective. Today's medical graduate is not able to deal with the basic health needs of the population.

There has been lot of debate on this issue and MCI has made efforts by changing the curriculum. In present system of Medical education the I MBBS phase has been reduced to 1 year in order to give the students more clinical exposure.

The eligibility of students for opting Medical Education in India is having passed higher secondary education. Therefore the students coming to medical colleges are not having sufficient exposure to basic sciences. In order to teach them the scientific basis of diagnosis and treatment it is essential to have sufficient knowledge of Anatomy, Physiology and Biochemistry. The reduced period of teaching in pre-clinical subjects and current restriction of animal experimentations leading to dry textbook curriculum has probably aggravated the situation.

Therefore, we must adopt more innovative methods of teaching along with Problem Based Learning and Integrated Learning Activities.

CME-04 Computer Assisted Learning in Basic Medical Disciplines

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Teaching of basic medical subjects is passing through a crucial phase in India. It is riddled with a number of problems eg. scarcity of faculty, paucity of funds etc. Moreover these deficiencies are affecting the quality of teaching, hence needs a change in teaching methodology, which should address to these problems. Efforts are on to tackle these problems through different new innovative methods. One of them being, Computer Assisted Learning which besides being a novel methodology, improves the understanding
A number of educational programs related to medical specialties have been developed and are available to medical students for study through Internet. Alternatively, such programs may be developed which would be interactive and as per need of students using multimedia softwares like Flash, Swiss and other similar programs. The programs on clinical problems, anatomy and physiological processes can easily be developed using these multimedia software. Moreover, Laboratory training Physiology and Pharmacology are suffering on account of the restriction on animal experimentation. Development of Computer simulated softwares on laboratory procedures may be great help, which besides minimizing the animal experimentation could enhance the learning process of the students.

CME - 05  IMPLEMENTATION OF PROBLEM BASED LEARNING INTO PRESENT CURRICULUM PRESCRIBES BY MEDICAL COUNCIL OF INDIA

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With explosion of professional and scientific knowledge, there is a demand for continuing self study. For model decision making, still in clinical reasoning and critical appraisal are mandatory. Management of patient involves collaborativc team work. Patients are better educated and more articulate and have higher expectations from doctors and physicians. Thus communication skill and negotiations skill are crucial.

The Medical Council of India (MCI) centrally control all the medical colleges of India and its rules are mandatory. In its regulations on Graduate Medical Education 1997 had emphasised that 'lectures are alone not adequate as a method of teaching / training. Every efforts should be made to encourage the use of active methods. Students should be made to encourage to learn in small groups through peer interactions. Maximal efforts has to be made to encourage integrated teaching between traditional subjects areas using problem based learning approach starting with clinical or community cases and exploring the relevance of various preclinical disciplines in both understanding and resolving the problem. Every attempt should be made to emphasize decompartmentalisation of disciplines.'

CME - 06  IMPLEMENTATION OF PROBLEM BASED LEARNING INTO PRESENT CURRICULUM PRESCRIBED BY MCI

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During past three decades problem based learning methods for medical students in a number of developed and developing countries across the world. Several well controlled studies established the superiority of PBL curriculum over the traditional one in terms of i) development of clinical reasoning skill, ii) application of basic science concept in clinical manifestations, iii) team work spirit, iv) acquisition and retention of knowledge, etc. This innovative teaching learning method a) exploits the students' inherent desire for learning, b) promotes self directed active learning with the help of carefully selected problems simulating a real clinical case and c) encourages the students to become a life long learner. Since the PBL curriculum is a student centered one, the students learn in small groups and teachers play the role of facilitators and consultants only.

Presently, the continued worldwide success of PBL curriculum and the MCI regulations has placed the medical education of India in a critical jucture. The MCI regulations 1997, clearly advocated for 'integrated teaching', 'problem based learning approach', and 'de-emphasize compartmentalization of disci-
plines to achieve both horizontal and vertical integration in different phases. The implementation of these advices necessitates restructuring or replacement of the present traditional curriculum by a carefully designed integrated problem based curriculum in a phase wise manner. At present, within the discipline based classical curriculum, an intra-discipline problem based approach for teaching has been welcomed in certain medical schools in India. This may be considered as a starting point for implementation of PBL, but with limited success. In a sample survey on nearly 200 physiology teachers working in medical colleges of different states in India revealed that approximately 55% of the teachers are not well aware of the problem based learning system. This demands a widespread awareness campaign across the country to educate the medical teachers by means of workshop and other teachers training programs. Further, for the successful implementation of problem based learning, every medical institution need a core group of motivated and committed teachers with total administrative support to overcome the inevitable resistance and challenges from various establishments and departmental prerogative forces.

CME - 07 PROBLEM BASED LEARNING

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Medical graduate education is a very wast. Each student is having his learning preference, i.e. Visual, Auditory, read & write and kinesthetic. Usually one preference out of this dominant up to the magnitude that it can effect the learners interest & extent of learning. For a teacher it is not possible to use simultaneously all the teaching tools designed for different type of learning preference.

So the only answer is the Problem based learning which is learner oriented, Where teacher act as a facilitator/stimulator. The students has own learning preference so fully interested for learning & fully motivated for learning.

Key-Note EMERGING TRENDS IN BIOMEDICAL SCIENCES: A CHALLENGE TO PHYSIOLOGISTS.

K. N. Sharma, Bangalore

Advances in biophysical, molecular and cellular biology over the last decades amount to a very major revolution in our knowledge of living systems. And as in all revolutions in science, new fields are created and existing fields either become subsumed into the newer disciplines or need new definitions with newer methods and concepts. The question for physiology thys to-day is to ask ourselves - the physiologists what those new definitions might be; or is there still something that can be distinctly called as physiological science; or has particular role now been fulfilled with its future lying in absorption by other discipline? These are some challenging questions which we, as physiologists, must face head on. If physiology is first and foremost a search for order, for logic of life, and which it has been proclaiming for so long, than the perceived information at molecular and cellular level – a reductionist approach, cannot simply serve or replace the discipline by itself. Moreover, to-day we are moving towards holistic medicine for reasons inkeeping with the emerging scientific trends, shifting emphasis from biomechanistic Newtonian approach to Einsteinian concept of matter and energy being interconvertable and see human beings as network of complex energy fields that interface with physical / cellular systems.

The animating life force, missing in Newtonian concept is claimed to be energy; and the modern scientific insights into the energetic nature of atoms and molecules making our bodies, combined with ancient mystical observations of the body's unique life-energy systems that are critical, has paved the way for this new and upcoming understanding of the 'energy systems' outside the physical body but interacting with it. There appears a distinct hierarchy of the bioenergy systems from physical to spiritual domains in an ascending order of frequency and form. And our body, as is known now, uses these multiform of energy. The developing technologies to monitor these energy system are still in their initial phase of infancy. However, the trends of the unfolding of these growing technologies such as Holographic techniques, Kirlian electrography, GDV, Chakras and etheric-aura measurement of bioenergy fields, are becoming not only
more and more evident but more and more relevant. These techniques and their relevance to the understanding of integrative functions of living systems will be highlighted with a fervent hope that physiologists will undertake this daunting task and accept the challenge since that alone seems to be the futuristic need.

**INV - 01**

**TOXIC INSULT OF LEAD ON HUMAN SPERM CELL**

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The adverse effect of lead on male reproductive system is well documented. The present study was undertaken to note the structural and functional impairment of sperm among lead exposed workers. High lead concentration in blood and semen lowers epididymal sperm counts and lowers motile epididymal sperm counts. Lead exposure probably affects the sperm function by activating one of the pathways of generation of ROS which have a powerful cytotoxic effect on spermatozoa and have been implicated in spermatozoa dysfunction and lowering of sperm count. Studies also revealed a weak association of sperm with antisperm antibody in semen and high prevalence of abnormalities of sperm with increased semen Lead. Recent study indicated that sperm head morphology of lead exposed worker exhibited the deterioration of membrane integrity which was further substantiated by electron microscopic study. Significant decrease in sperm motility was also observed among the lead exposed groups. Regression of sperm cell was conspicuous among the exposed groups and the finding was supported by the high level of acid phosphatase activity in seminal plasma. The cellular regressive stress was protected by the seminal plasma protein which showed higher value after lead exposure for shorter duration. On the other hand, higher duration of exposure failed to give the supportive mechanism to the sperm cell. No change was observed in the testosterone, FSH & LH level. Our earlier studies on rats treated with lead acetate indicated that blood lead concentration >30-40µg/dl was associated with impairment of spermatogenesis and reduced concentration of androgens. In human study, concentration of seminal lead > 15µg/dl showed decrease sperm count, volume, motility and morphological alteration and no effect on endocrine profile.

Considering all the results relating the reduction in epididymal sperm motility with high blood/semen Lead, it can be hypothesized that probably lead, being a divalent cation, interferes with the Na-K-ATPase system which is main functional unit for sperm motility and gets deposited in the semen.

**INV - 02**

**EFFECT ON IN VITRO ANOXIC INSULTS ON SPINAL SYNAPTIC TRANSMISSION**

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Different forms of anoxia such as, hypoxia (O₂ lack), aglycemia (glucose lack), ischemia (combination of both hypoxia and aglycemia) or chemical anoxia (lack of cellular utilization) can be produced in in vitro preparations like spinal cord, hippocampal or brain slices/preparations or cultured cells. Using these models of anoxia, the effects of aglycemia and ischemia were evaluated on spinal reflexes evoked in the isolated spinal cords. The stimulation of a dorsal root evoked reflex potentials in the corresponding segmental ventral root. The potentials were temporally dispersed and the potential appearing at first has a latency of 3-5 msec, known as monosynaptic reflex (MSR). The potentials appearing subsequently are polysynaptic in origin (>10 msec latency) and are known as polysynaptic reflexes (PSR). Superfusion of solution deficient in “glucose” (aglycemia or “glucose+O₂” (ischemia) depressed the reflexes in a time-dependent manner within 30 min. The energy supplementation to the aglycemic or ischemic medium delayed the onset of depression induced by them. In the presence of N-medicine, medical ethics, disaster management and environmental sciences are emerging as separate subjects. The understanding of these
areas are very much essential for the current situation. The exclusion of the above areas of science in medical education produces an incomplete physician. The curriculum is already packed and no one is ready to yield. Although it is not practical to add new courses or subjects, yet there is a need for a change. For example, the growth of genetics and genetic engineering have revolutionized the treatment protocols. It is not essential then to impart appropriate knowledge of genetics to the undergraduates? Another important area is the expansion and intrusion of Information Technology in all domain of science and the medical science is no exception to it. Thus it is another big challenge that demands the solution. The medical colleges at present do not stress on the information technology either in the classroom or non-classroom environment. The information technology will have big impact on the teaching and learning processes of medical students. The physician of 2020 is going to use more computer technology, genetics knowledge, or molecular biology than the physician of 2000. We have to train our students in teaching learning methods in these newer areas. This is the need of the hour and can be achieved by self directed learning.

**INV - 03** PATHOPHYSIOLOGY OF NEURODEGENERATIVE DISEASES WITH SPECIAL EMPHASIS ON AMYOTROPIC LATERAL SCLEROSIS.

Dr. T.R. Raju

**INV - 04** LIFE SAVING ROLE OF INSULIN IN SCORPION ENVENOMING SYNDROME A WIDER PERSPECTIVE OF THE PHYSIOLOGICAL BASIS OF MEDICAL PRACTICE

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Death caused by scorpion poisoning due to scorpions of Buthidae family is a common event in many of the developing countries in tropical and subtropical regions.

Cause of death in severe scorpion envenoming: Severe scorpion envenoming in the experimental animals (rabbits, dogs, rats and many other animals), scorpion stung children and adults cause an autonomic storm resulting in a massive release of catecholamines, angiotensin II, cortisol, thyroid hormones and changes in insulin secretion (many times hypoinsulinemia and other times hyperinsulinemia). As a consequence of these changes in the hormonal milieu, scorpion poisoning results in a syndrome of fuel deficits and an inability of the vital organs to utilize the existing metabolic substrates, which causes acute myocardial infarction, ischaemia, arrhythmias, conduction defects and myocarditis, cardiovascular disturbances, peripheral circulatory failure, pulmonary oedema (Adult Respiratory Distress Syndrome), disseminated intravascular coagulation, acute pancreatitis and many other clinical manifestations alone or in combination, producing multi-system-organ-failure (MSOF) and death.

**Treatment:** INSULIN - GLUCOSE infusion (0.3 Units of insulin per gram of glucose and glucose at the rate 0.1 g/kg body weight/hour) for duration of 24 hours to 72 hours along with acid-base electrolyte-fluid balance completely reversed all the above-mentioned clinical manifestation.

**Background:** The efficacy of insulin administration in reversing haemodynamic changes and pulmonary oedema in victims of scorpion sting is assessed by our study based on animal experiments in which insulin administration reversed metabolic and electrocardiographic changes induced by scorpion envenomation.

**Conclusion:** Administration of insulin-glucose infusion to scorpion sting victims appears to be the physiological basis for the control the metabolic response when that has become a determinant to survival.
Inv - 05 Laparoscopic Surgery Present, Past & Future

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Inv - 06 Insulin Secretagogues:

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Insulin secretagogues are the drugs which are capable of stimulating B-cell to increased their endogenous insulin secretion. They may directly stimulate insulin secretion or they may increase insulin secretory response to nutrient such as a glucose.

The history of insulin secretagogues in type-2 diabetes mellitus dates back more than 45 years to the introductions of sulfonylurea which even today is the most effective and widely used agents. About 65 years back E.P Joslin believed that goals of therapy in patients with diabetes mellitus should include a serious effort to achieve blood glucose levels as close to normal as possible. Various long term studies like DCCT and UKPDS suggest tight metabolic control can prevent long term complications. Although DCCT trial was done on type-1 diabetes patients but also applicable to type-2 diabetics.

However in clinical practice normalizations of blood glucose levels and more so control of post prandial surge of blood glucose levels is a formidable challenge.

Repetitive post prandial hyperglycaemia may play an important role in functional and structural changes in eyes, kidneys, heart and nerves etc. In the last few years some new compounds emerges like glimeperide an sulfonylurea moiety and drug for post prandial control of blood sugar like repaglinide a meglitinide derivatives and nateglinide a D phenylalanine derivaties.

The most important question in defining the clinical use of an Insulin Secretagoues includes:

1. How effective is its optimal dose in achieving glycemic control.
2. Can it reduce the logtime between plasma glucose rise and insulin secretion after nutrient ingestion.
3. Is it duration of action short enough at its dependence on plasma glucose levels sufficient to minimize serious post prandial or fasting hypoglycaemia.
4. Does it have side effects that cause significant symptoms or reduce long term beneficial outcome.
5. And does it have drug drug interaction that complicate its use with many commonly used and necessary drugs.

Inv - 07 New Formulae for Quick and Accurate Calculation of Electrical Axis of the Heart.

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Electrical axis (EA) of the heart is altered in many physiological and clinical conditions and its measurement is important in electrocardiographic diagnosis. A method for calculating EA quickly and accurately will be useful for objective monitoring of even small changes in the axis of large number of subjects.
Determining the EA by plotting values of R-S on the Einthoven's triangle is time consuming and cumbersome while the results obtained by visual inspection of hexaxial reference system are not accurate. Earlier workers have suggested formulae for calculating electrical axis of the heart. But these formulae are either difficult to use or inaccurate. In the present paper, we describe six new formulae for quick and accurate calculation of EA from bipolar and unipolar limb leads with the help of an inexpensive pocket model scientific calculator. Using values of R-S in leads I and II the EA can be obtained by the formula:

\[ \theta = \tan^{-1}\left(\frac{2 \times I - II}{\sqrt{3} \times I}\right) \]

Using values of R-S in leads I and VF the EA can be obtained by the formula:

\[ \theta = \tan^{-1}[aVF/I] \]

When I is positive, EA = \(\theta\). When I is negative, EA = \(\theta\) - 180 if \(\theta\) is positive and \(\theta\) + 180 if \(\theta\) is negative. Similarly, we have given formulae to derive EA using other limb leads.

INV-08 NEUROPHYSIOLOGY OF AGING AVERAGE LIFE SPAN

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Average life span of an individual species is genetically programmed. Each species has a genetically programmed biological clock which culminates in death if not prematurely terminated by disease or accident. The number of years that an individual live on its natural course is the Average Life Span of the species. This is more or less fixed and are usually not changed by development in medical science. It is also different for different species. For example, the Average Life Span of a mouse is 2 years, rhesus monkey 25 years, African elephant 75 yrs, Galapagos tortoise 100 years and for human being 85 years. Only very few individual will live beyond their average life span. Jeanne Calment of France is the most famous of the well documented individual who died in the year 1998 at the age of 122 years.

INV - 09 INVITED PAPER
Dr. Mohan Kumar

AWARD PAPERS
GOITRE IN IODINE REPLETE, MALNOURISHED AND IRON DEFICIENT POPULATION OF SOUTH INDIA: TRUTH OR FICTION
S. BRAHMBHATT, R. BRAHMBHATT, G. HATHI, C EASTMAN AND S. BOYAGES

STATUS OF CLINICAL PHARMACOLOGY IN DEVELOPING COUNTRIES.
Dr. N.R. Biswas, Addl. Professor, AIIMS, New Delhi - 110 029

Clinical Pharmacology can be defined as the medical discipline concerned with the action of medical drugs in humans including human metabolism of drugs, their therapeutic effects in sick patients and adverse effects and risks that accompany the use of these drugs. A Clinical Pharmacologist (C.P) is a medical professional whose career is devoted to teaching and research in clinical pharmacology and to patient care in a relevant medical specialty or subspecialty. Except for a few countries, there has been a notorious lack of development and growth of Clinical Pharmacology (CP) in the developing world. In those countries where Clinical Pharmacology (CP) is present, its development has generally followed the pattern established in; and transferred from the more developed countries and has entrenched itself mainly in the pharmaceutical industry and in Teaching Institutions with little or no interaction with Primary Health Centre.
(PHC). As a result of this insufficient or complete lack of relevant interaction between Clinical Pharmacology (CP) and Primary Health Centre (PHC), the primary care health worker does not perceive a need for the potential contributions of Clinical Pharmacology (CP). With exception of the highly varying access to essential drugs, the qualitative problems in the utilization of pharmaceuticals have been found to be more or less similar worldwide. However, the discrepancy between public health needs and availability of essential drugs in many developing countries is extremely critical. The concept of essential drugs (EDC); that is, the selection of drugs that meet the health needs of the majority of the population, based on scientific evaluation, emerged in response to the need to bridge the gap between need and supply. Thus, for its implementation, the contributions of Clinical Pharmacology (CP) are needed in: a) the teaching and training of health professionals on the healthy use and non-use of pharmaceuticals, b) research that is truly relevant to the therapeutic problems and conditions of Primary Health Centre (PHC), where most of the pharmacologic and non-pharmacologic interventions (including the use of traditional medicines) occur and where appropriate information is most needed, even in the more developed countries; and c) the development and formulation of rational national drug policies and the implementation of rational drug systems (drug evaluation and registration, surveillance of drug utilization, monitoring for adverse drug reactions, and provision of objective drug information). What was expected from a clinical pharmacologist more than a decade ago is still persisting rather urgently because of sudden increases of various drugs in the market recently which needs judicious and rational prescribing. In this era of economic shrinkage when maximum utilization of resources is highly needed, who will be the best person other than a clinical pharmacologist to guide the drug controller of India about National drug policy, to formulate Hospital and National Drug Formulary, to report Adverse Drug Reaction to the Government, to the Physicians and above all to the company concerned? It is again the duty of a Clinical Pharmacology (CP) to evaluate clinically therapeutic efficacy and toxicities of medical plants as well as allopathic medicines, information to the physicians about new drugs, and directly service to the patients by therapeutic drug monitoring & consultations on therapeutics particularly in the treatment of poisoning and drug interactions.

MITOCHONDRIAL K\textsubscript{ATP} CHANNEL ACTIVATION IS IMPORTANT IN THE ANTIARRHYTHMIC AND CARDIOPROTECTIVE EFFECTS OF NON-HYPOTENSIVE DOSES OF NICORANDIL AND CROMAKALIM DURING ISCHEMIA/REPERFUSION: A STUDY IN AN INTACT ANESTHETIZED RABBIT MODEL.

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The roles of cardiomyocyte sarcolemmal ATP-sensitive K\textsuperscript{+} (K\textsubscript{ATP}) and mitochondrial K\textsubscript{ATP} channel in the cardioprotection and antiarrhythmic activity induced by K\textsubscript{ATP} channel openers remain obscure, though the mitochondrial K\textsubscript{ATP} channels have been proposed to be involved as a subcellular mediator in cardioprotection afforded by ischemic preconditioning. In the present study, we investigated the effects of administration of non-hypotensive doses of ATP-sensitive K\textsuperscript{+} channel (K\textsubscript{ATP}) openers (nicorandil and cromakalim), a specific mitochondrial K\textsubscript{ATP} channel blocker (5-hydroxydecanoate (5-HD)) and a specific sarcolemmal K\textsubscript{ATP} channel blocker (HMR 1883;1-[5-2-(5-chloro-o-anisamido)ethy1]-2-methoxyphenylsulfonyl]-1-3-methylthiourea) prior to and during coronary occlusion as well as prior to and during post-ischemic reperfusion on survival rate, ischemia-induced and reperfusion-induced arrhythmias and myocardial infarct size in anesthetized albino rabbits. The thorax was opened in the 4th international space and after pericardiotomy the heart was exposed. In Group I (n=80), occlusion of the left main coronary artery and hence, myocardial ischemia-induced arrhythmias were achieved by tightening a previously placed loose silk ligature for 30 min. In Group II (n=184), arrhythmias were induced by reperfusion were induced by reperfusion following a 20
min ligation of the left main coronary artery.

Both in Group I and II, early intravenous infusion of nicorandil (100μg/kg bolus+10μg/kg/min), HMR 1883 (3 mg/kg)/nicorandil and HMR 1883 (3 mg/kg)/cromakalim just prior to and during ischemia increased survival rate (75%, 67%, 86% and 75% versus 60% in the control subgroup in Group I; 75%, 75%, 75% and 67% versus 50% in the control subgroup in Group II), significantly decreased the incidence and severity of life-threatening arrhythmias and significantly decreased myocardial infarct size. However, late intravenous administration of nicorandil or cromakalim at the onset and during reperfusion did neither increase survival rate nor confer any antiarrhythmic or cardioprotective effects. The antiarrhythmic and cardioprotective effects of both nicorandil and cromakalim were abolished by pretreating the rabbits with 5-HD (5mg/kg, i.v. bolus), a selective mitochondrial K\_ATP channel blocker but not by HMR 1883 (3mg/kg). In the present study, higher levels malondialdehyde (MDA) and lower levels of reduced glutathione (GSH) and superoxide dismutase (SOD) in necrotic zone of myocardium in all the 16 subgroups in Group II suggest little anti-free radical property of nicorandil and cromakalim.

We, therefore, conclude that intervention by intravenous administration of nicorandil and cromakalim (through the selective activation of mitochondrial K\_ATP channels), increased survival rate and exhibited antiarrhythmic and cardioprotective effects during coronary occlusion and reperfusion in anesthetized rabbits when administered prior to and during coronary occlusion. The mitochondrial K\_ATP channel may © 2003 Elsevier Science Ltd. All rights reserved.

**IONIC BASIS OF THE PACEMAKER POTENTIALS IN SINO-ATRIAL NODE : UNFOLDING MYTHS OF CARDIAC PACEMAKER**

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Sino-atrial node (SAN) generates spontaneous rhythmic electrical activity (SREA), at definite cycle length (CL), necessary for cyclic activation of rest of the heart. SREA of SAN is under strong vagal and sympathetic control via neurotransmitter modulation of its various components. The primary pacemaker (P) cells of SAN are considered to be the seat of origin of the cardiac pacemaker activity. The P cells exhibit SREA characterized by slow pacemaker potential (or diastolic depolarization, DD, (phase 4, V\_max\_I), slow upstroke velocity (phase 0, V\_max\_O) of action potentials (AP), and a maximum diastolic potential (MDP) of -50 to -65mV. The DD requires flow of depolarising current across the plasma membrane of P cells. Our early micro-electrode studies on isolated rabbit SAN showed that low Ca\(^{2+}\) (0.25 to 1mM) and low Na\(^{+}\) (35 and 78mM) reduced V\_max\_I and V\_max\_O and increased CL\(^{14}\). High Ca\(^{2+}\) (2.5 to 8 mM) had opposite effects. Verapamil and nifedipine also reduced V\_max\_I and V\_max\_O and increased CL. Isoproterenol accelerated V\_max\_I and V\_max\_O and increased CL while acetylcholine exerted opposite effects. These observations indicated key roles of slow Ca\(^{2+}\) and slow Na\(^{+}\) conductances in DD and phase 0\(^{14}\). Possible roles of T-Type Ca\(^{2+}\) channels and Na, Ca-exchanger in DD and phase 0 were also evident from the inhibitory effects of Ni\(^{2+}\) on V\_max\_I and V\_max\_O. Voltage and patch-clamp studies on isolated SAN cells substantiated our hypothesis of predominant role of slow Ca\(^{2+}\) (cardiac L-type, a\_v, or Ca\_V\_1.2) channels in phase 0. But the myth of ionic basis of DD deepened further with the identification of several additional ionic current components, namely, I \_K\_o (Ca\_V\_1.2), I \_Na\_o, I \_K\_atp, I\_sus, and I\_p. Discovery of I\_p, carried by Na\(^{+}\) via HCN channels explained our earlier observations on the effects of low Na\(^{+}\) on SREA and initiated a flurry of research to unfold the myths of pacemaker potentials in SAN. Cloning of HCN channels and development of Specific Bradycardiac Agents provide new insights into our understanding of the ionic basis of DD and offer novel possibilities for therapeutic control of heart rate. Nevertheless, mysteries of pacemaker potentials in SAN will be fully resolved only after complete analysis of roles of the other ionic currents.

**HIGH ALTITUDE PHYSIOLOGY : ARMED FORCES PERSPECTIVE**

Air Vice Marshal (Mrs.) P Bandopadhyay AVSM, VSM, Addl DGAFMS, Ministry of Defence

Army Scenerio

"Great things are done when men and mountains meet" - Sir Cyril Astley Clarke
The human body has adapted itself to function optimally at sea level. Most human habitations are at an altitude below 1000m. Tactical and operational reasons have forced Indian Army and Indian Air Force to establish permanent bases at high altitude areas (HAA).

HA is classified as follows:

<table>
<thead>
<tr>
<th>Nomenclature</th>
<th>Height above MSL (m)</th>
<th>Height above MSL (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate/Intermediate</td>
<td>1500-2400</td>
<td>5000-8000</td>
</tr>
<tr>
<td>High Altitude</td>
<td>2440-4270</td>
<td>8000-14000</td>
</tr>
<tr>
<td>Very High Altitude</td>
<td>4270-5490</td>
<td>14000-18000</td>
</tr>
<tr>
<td>Extreme Altitude</td>
<td>5490-8848</td>
<td>18000-29028</td>
</tr>
</tbody>
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A sudden change in altitude for the unacclimatised subject for a short or long duration introduces a stimulus for the physiological systems to readjust to the new environment. The changes that occur at HA are essentially effects of Hypoxia, cold, reduction in relative humidity, increase in solar, Ultra Violet, Ionising and cosmic radiation.

**BRAIN WAVES: FROM DIAGNOSIS TO CRIME DETECTION**

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The technique of tracing nerve fibers/tracts in the spinal cord and brain has shown tremendous development, sophistication and precision. Right from micro dissection, tracer dyes and radio-nucleotides, and fluorescent techniques in animals to newer techniques of brain imaging like CT scan, MRI and electrophysiological assessment procedures have revolutionized this field. The neuro-physiological techniques include recording of brain potentials (waves) in form of unit/multiunit, activity-stimulus related potentials, and event related potentials. in stimulus related potentials auditory, visual and somato-sensory short, mid and long latency responses are useful in tracing neural tracts from specific receptor to pathways in brainstem, thalamus and Up to sensory cortex. These stimulus locked, volume conducted signals can be recorded from the scalp after they are integrated in the relay station (generators) on their pathways. The latency and waveform of these potentials reflect conduction time and excitability of neuronal pool of the generators. Hence any dysfunction of these tracts even at sub-clinical level can be diagnosed.

Event related potentials are long latency endogenous cerebral potentials indicating higher brain functions emanating from cortical association & limbic areas of the brain. They have wide application in field of cognition at large and cognitive, forensic sciences, toxicology and interrogative polygraphy (lie detection) in particular. Late vertex positivity in ERP reflects guilt detection and the test known as guilty knowledge test. Memory and encoding related multifaceted electro-encephatographic responses (MERMER) have been used to determine whether subject had relevant information (committing of crime) in his brain, after presenting him with probing (relevant), Target and non-target stimuli. Future research will prove the potentiality of this ERP technique as an investigative tool in criminal and espionage cases. The newly emerging late responses of Event related potentials are a step forward to quantify the very thought processing of the brain. Brain Wave Science has emerged a new discipline in the recent times having lots of promises.

**PH - 1 COMPARATIVE CLINICAL STUDY OF CASTOR OIL AND DECLOFENAC SODIUM IN PATIENTS OF OSTEOARTHRITIS**

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A comparative clinical study was conducted to compare the safety and efficacy of castor oil and diclofenac sodium in patients of primary knee osteoarthritis. Subjects with sign symptoms of primary knee osteoarthritis were given castor oil capsule 0.09 ml (n = 50) twice daily for 30 days and tab diclofenac sodium (n = 50) 50 mg thrice daily for 30 days. Subjects completed an over all evaluation of symptoms
relief on 15th day and on 30th days of completed treatment. Subjects were evaluated by clinical, routine laboratory and radiographic investigations for improvement of disease conditions, also for adverse drug reaction. On 30 days of completed treatment, it was observed that both the drugs are significantly effective in treatment of primary knee osteoarthritis and adverse drug reaction are high with diclofenac sodium whereas castor oil has no side effect. Therefore, it was concluded that castor oil can be used as an effective therapy in primary knee osteoarthritis.

Key words: Diclofenac Sodium, Castor Oil, Osteoarthritis.

PH - 2
A STUDY OF THE 'SAFETY' OF ORAL AQUEOUS EXTRACT OF TINOSPORA CORDIFOLIA IN HEALTHY HUMAN VOLUNTEERS (PHASE I CLINICAL TRIAL).

Authors: Rao Yeshwant, Bairy KL, Kumar KB*

Department of Pharmacology*, Department of Clinical Psychology.

Objectives: To assess the safety profile of oral aqueous extract of Tinospora cordifolia in healthy human volunteers.

Methods: A total number of 30 healthy volunteers of either sex in the age group 18-40 years were given 500 mg tabs of T. cordifolia once a day for 21 days orally along with food in the morning, after obtaining informed consent and ethical clearance. Safety assessment consisting of general examination, systemic examination, biochemical & hematological estimation & ADR monitoring by open questionnaire method & neurological assessment by UKU scale was done after 21 days.

Results: Statistical analysis of the values of the various blood investigations by paired t test showed no significant changes before and after the treatment. ADR monitoring by open questionnaire method also did not find any adverse effects during and after the period of drug intake & neurological assessment scale was normal.

Conclusion: Tinospora cordifolia is safe at the dose of 500mg for a duration of 21 days.

PH - 3
ANTIIINFLAMMATORY EFFECT OF ASPARAGUS RACEMOSUS IN RATS

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Department of Pharmacy, Pharmacology * & Biochemistry**

PGIMS, Rohtak - 124001 (Haryana)

Asparagus racemosus (Shatavari, family - asparagaceae) is used in traditional system of Ayurvedic medicine as a galactogogue, nerve tonic, aphrodisiac and to relieve backache. In the present investigation aqueous extract of root of A. racemosus was tested for its anti-inflammatory activity.

Albino rats of either sex (150-160 g), with free access to standard diet and water were used. Inflammation was induced in rat hind paw by injecting Carrageenine and formaldehyde intradermally. Animals were divided into 5 groups of 7 rats each as follows: GP I - (Control) N Saline, GP II - Carrageenin (0.05 ml of 1% Soln in normal saline), GP III - A racemosus extract (100mg/kg,ip) + Carrageenin, GP IV - Formaldehyde (0.1 ml of 2% solu) & GP V - A racemosus extract (100mg/kg, ip) + formaldehyde. Volume of paw edema was measured by means of mercury displacement method at 1, 3 & 5 hrs after carrageenin and in case of formaldehyde readings were taken daily for 7 days.
Results of carrageenin induced paw edema indicate antiinflammatory activity of aqueous root extract of \textit{A. racemosus}. Root extract (100mg/kg, ip) pretreatment significantly (p<0.01) inhibited the edema formation induced by carrageenin when assessment was made at 3 and 5 hrs after injection. Daily treatment with \textit{A. racemosus} root extract markedly reduced formaldehyde induced paw edema from days 2 to 7 when compared to control. After 5 days treatment, edema was completely disappeared in drug treated group.

\textbf{PH - 4 AN AUDIT OF DRUG PRESCRIBING PRACTICES OF DENTISTS IN A TERTIARY HOSPITAL IN WESTERN NEPAL}

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\textbf{Objectives} :- Data are scarce on the prescribing habits of dental practitioners, and drug use in dentistry and stomatology are undertaken to determine the pattern of drug use for patients seeking treatment in the dental outpatient department (OPD) of Manipal Teaching Hospital (MTH), part of the Manipal College of Medical Sciences, in Pokhara, Nepal.

\textbf{Methods} :- 1820 prescriptions of dental patients attending the dental outpatient at Manipal Teaching Hospital (MTH), Fulbari, Pokhara, Nepal were collected by a random once weekly survey between March 2001 to February 2002. The information was compiled, scored and analyzed in consultation with dentists using WHO guidelines.

\textbf{Results} :- Males numbered 801 (44%) and females 1019 (56%). Most of the patients were aged between 13-25 years. The dental disorders most frequently reported in our study were diseases of pulp and periapical tissue (36.5%), gingivites and periodontal disease (28.5%), dental caries (16%). The average number of drugs prescribed was 2.03 (3698/1820) and 66% prescriptions contained antimicrobials (1 or 2). 21% drugs were prescribed in generic names and 38% drugs were fixed doses combinations of 2 or more drugs. 4/5 of the prescribed drugs were systemic agents and 1/5 were local/topical agents. The most commonly prescribed systemic agents were analgesics (43.7%) followed by antimicrobials (39%). The most commonly prescribed local/topical agents were antinfectives (74%). In the present study, NSAID's (89.6%) were the preferred analgesic over narcotic analgesics (10.4%). The most frequently prescribed systemic analgesic and antimicrobials were ibuprofen and amoxycillin, respectively.

\textbf{Conclusion} :- This study may help in indentifying the problems involved in therapeutic decision making for patients in third world countries who spend 30-40% of their total health budget on drugs, some of which are useless and expensive. There is a clear need for the development of prescribing guidelines and educational initiatives to encourage the rational and appropriate use of drugs in dentistry.

\textbf{PH - 5 EFFECT OF FENUGREEK SEEDS ON BLOOD SUGAR SERUM LIPIDS IN NORMAL AND DIABETIC RATS}

\textbf{Das S., Jha R., Talukdar N.}

Department of Pharmacology, Assam Medical College, Dibrugarh, Assam

\textbf{Objective} :- To assess the effect of Fenugreek seeds on blood sugar and serum lipids in normal and alloxan induced diabetic rats.

\textbf{Methods} :- Albino rats weighing 150-200 gms of either sex were divided in four groups, with each group containing six rats. Group I was normal control received normal saline, Group II received fenugreek seed 6mg/ kg/ day orally, Group III and Group IV were made diabetic by administering a single dose of 140 mg/kg body weight. After seven days of alloxan administration, normal saline was given to group III and Fenugreek seed 6 mg/ kg/day was given to Group IV. The level blood sugar,
serum cholesterol, serum triglyceride, LDL and HDL were estimated at 0, 1\textsuperscript{st}, 2\textsuperscript{nd}, 3\textsuperscript{rd} and 4\textsuperscript{th} week of treatment.

Result:- Fenugreek significantly decreased (P<0.05) the blood sugar level in normal rats. The maximum fall was observed at 4 weeks. But no significant change (P>0.05) of serum lipid levels were observed. In alloxan induced diabetic rats there was significant increased (P<0.05) in blood sugar, serum cholesterol, serum triglyceride, LDL levels however no significant change (P>0.05) in HDL levels was seen. There was a significant fall (P<0.05) in the levels of blood sugar, serum cholesterol, serum triglyceride and LDL when alloxan induced diabetic rats were treated with fenugreek seeds and the maximum fall was observed at 4 weeks.

Conclusion:- The study indicates that fenugreek seeds has a significant hypoglycemic, antidiabetic and hypolipidemic effect.

Key words: Fenugreek, Alloxan, Diabetic, Hypolipidemic, Hypoglycemic.

PH - 6

A STUDY ON ANTI DIABETIC ACTION OF FENUGREEK ON ALLOXAN INDUCED DIABETIC ALBINO RAT.

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Department of Pharmacology, Assam Medical College, Dibrugarh

Aims And Objectives:- The study has been undertaken to evaluate the effect of Trigonolca foenum graccum (fenugreek) on alloxan induced diabetic albino rat in comparison to glibenclamide.

Materials And Methods :- Drugs to be used in the study are fenugreek - aqueous extract asv 10% decoction of fenugreek seed powder freshly prepared. Does is 6 mg/kg/day orally daily for 4 weeks.

Alloxan monohydrate to induce diabetes in rats. Dose is 120 mg/kg body weight.

Experimental Design :- Twenty four rats were taken for normal blood glucose estimation. The rats having blood glucose level 80 - 120 mg/100ml were taken for experiment. Diabetes was induced in animal by injecting a single dose of intraperitoneal injection of alloxan monohydrate in the dose of 120 mg/kg. Eighteen rats with blood glucose level 200mg/100ml or above, included in the experiment. Diabetic rats were divided into three groups, having six animal per group. Group I received equal volume of normal saline 1.6ml/kg/day orally. Group II received aqueous extract of fenugreek seed 6mg/kg/day orally. Group III received standard drug (glibenclamide) 2mg/kg/day for 4 weeks.

The blood glucose level estimation was done at the end of first, second, third and fourth week.

Result:- The study shows significant antihyperglycaemic effect (P < 0.05) which was evident from second week and was highly significant (P < 0.001) in the fourth week.

Conclusion:- The present study establishes the highly significant antihyperglycaemic effect of fenugreek seeds.

PH - 7

ANTIDIABETIC ACTION OF AZADIRACHTA INDICA ON ALLOXAN INDUCED DIABETIC RATS.

Phukan Daisy, Lahkar M, Das S.

Department of Pharmacology, Assam Medical College & Hospital, Dibrugarh

Objective:- To study the antidiabetic action of alcoholic extract of leaves of Azadirachta Indica on Alloxan induced diabetic rats in comparison to Glibenclamide.

Method:- The tests were carried out in sixty healthy albino rats. Fifty animals were considered for the experiment which showed blood glucose level in between 80 - 120 mg/dl. Ten rats of them were taken as group I (normal control group) and were kept in a separate animal cage. Other forty animals were tested for hyperglycaemia. Alloxan monohydrate was given to them in normal saline solution in the dose of 120 mg/kg body weight (10ml/kg body weight) intraperitoneally as a single dose. All forty animals were kept
isolated in animal cages for one week. The blood glucose were estimated asfter seven days. Thirty rats
showing blood glucose level of ≥200 mg/dl were considered diabetic and were divided into three groups;
Diabetic control (gp II), Test (gp III) and Standard (gp IV) having ten rats in each group.

The animals were treated with Normal saline (1ml/kg), methanolic extract of A. Indica (20 mg/kg),
and Glibenclamide (25 mg/kg) in their respective groups per rat orally daily for four weeks. At the end of
each week, blood glucose level was estimated in each rat. The results of the four groups were compared
and analyzed for statistical significance.

Results:- The blood glucose was found to be significantly decreased in both test and standard
group to a normal level while the diabetic control group showed gradual rise till the end of the experiment
and those of the normal control group were within a normal range.

Conclusion:- The present study suggest that Azadirachta Indica have beneficial effects in estab-
lished diabetes mellitus.

Key words: Azadirachta indica, Neem, Alcoholic extract, Antidiabetic action, Glibenclamide, Albino
rat, Alloxan monohydrate.

PH - 8 EFFECT OF ARL 67156 ON ECTO-ATPASE ACTIVITY AND
EXCITATORY JUNCTION POTENTIALS (EJPS) IN THE GUINEA
PIG VAS DEFERENS

P Ghildyal & R Manchanda
Biomedical Engineering Group, School of Bioscience and Bioengineering, Indian Institute of Technology-Bombay, Mumbai

Synaptic ecto-ATPase is thought to limit the half life of ATP at sympathetic neuromuscular junctions
in the vas deferens thereby modulating purinergic neurotransmission. We have explored the properties of
this inactivation mechanism by studying the influence of ARL 67156, a putative ecto-ATPase inhibitor, on
ecto-ATPase activity and its effect on the underlying synaptic potentials in guinea pig vas deferens. Malachite
green method for inorganic phosphate detection was used to determine the ecto-ATPase activity. This
activity was found to be insensitive to known endo-ATPase inhibitors and dependent on Ca²⁺ and
Mg²⁺. The $V_{max}$ and $K_m$ values were $958.4 \pm 66.3$ pmol/min/mg and $625.1 \pm 45.2$ µM ARL 67156 (100 µM)
reduced enzyme activity by 50.7% ($n = 13$). Stimulation-evoked EJPs (at 0.9 Hz) in the vas were measured
using intracellular glass microelectrodes (30-50 MΩ impedance) at 37°C. ARL 67156 increased EJP amplitudes
by 54.7% ($n = 87$), Rise time by 55.6% ($n = 39$), 90% decay by 25.5% ($n = 115$) and 80% width
by 45.2% ($n = 70$). The percentage increase in the EJP parameters is comparable to the drop in enzyme
activity in presence of ARL 67156. These results suggest that ecto-ATPase activity might be responsible
for fine-tuning purinergic neurotransmission at the synapse by regulating the synaptic potentials.

PH - 9 EFFECT OF ARL 67156 ON SPONTENOUS EXCITATORY JUNCT-
ION POTENTIALS IN GUINEA PIG VAS DEFERENS

P Ghildyal & R Manchanda
Biomedical Engineering Group, School of Bioscience and Bioengineering, Indian Institute of Technology-Bombay, Mumbai

Synaptic ecto-ATPase are thought to regulate purinergic neurotransmission at the sympathetic
neuromuscular junction in vas deferens by limiting the action of ATP in the synaptic cleft. In order to
elucidate the consequence of ecto-ATPase inhibition on the time courses of postjunctional conductances
we have studied the effect of ARL 67156 on spontaneous excitatory junction potentials (sEJPs). This is
because the currents underlying neurotransmission are better inferred from the sEJPs. sEJPs from guinea
pig vas deferens were measured in vitro using intracellular microelectrodes (30-50 MΩ impedance) at
37°C. 100 µM ARL 67156 increased the sEJP rise time ($R_t$) by 85.9% ($n = 29$), 90% decay ($D_{90}$) by 20%
and 80% width (W_a) by 71.5% (n = 21). The sEJP amplitude histogram shifted right-ward (n = 39) and frequency of sEJP occurrence increased from 0.16 ± 0.05 to 0.56 ± 0.03 Hz (4 cells). Persistence of synaptic ATP due to enzyme inhibition by ARL 67156 could result in multiple binding of the neurotransmitter to its post-synaptic receptors and its reflected by the increased R_p, D_90 and W_a of sEJPs. However, increased frequency and amplitude of sEJPs suggests that ecto-ATPase inhibition by ARL 67156 may influence neurotransmitter release via presynaptic P1 & P2 receptors.

PH - 10 EFFECT OF HEPTANOL AND NIFEDIPINE ON NORADRENALINE INDUCED CONTRACTIONS IN RAT VAS DEFERENS

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Biomedical Engineering Group, School of Bioscience and Bioengineering, Indian Institute of Technology-Bombay, Mumbai - 400076

The present study was aimed at investigating role of intercellular coupling in three different components of exogenous noradrenaline (NA) induced contractions: phasic, tonic and oscillatory in rat vas deferens using the putative gap junction blocker heptanol and the role of extracellular Ca^{2+} ([Ca^{2+}]_o) in these contractions with the use of nifedipine. Heptanol (2.0 mM) profoundly inhibited the tonic and oscillatory components induced by 20 μM NA by 93.4 ± 2.5% and 100% (n = 4 in all cases). The phasic component of the NA induced contraction was only partially suppressed by heptanol (34.7 ± 4.4% reduction, n = 4). Nifedipine (2 μM) reduced the phasic component slightly (7.5 ± 5.3%) but inhibited the tonic and oscillatory components drastically (90.5% and 81.9% inhibition respectively). The drastic reduction of the tonic component by heptanol and nifedipine suggests that this phase may depend strongly on intercellular communication possibly via gap junctions along with [Ca^{2+}]_o. Phasic component could be due to direct action of exogenous NA on outermost layer of cells. These conclusions will be further discussed.

PH - 11 EFFECT OF SURAMIN AND PRAZOSIN ON BIPHASIC CONTRACTIONS OF RAT VAS DEFERENS

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Biomedical Engineering Group, School of Bioscience and Bioengineering, Indian Institute of Technology-Bombay, Mumbai - 400076

The role of purinergic and adrenergic transmission in the biphasic contractions of the rodent vas deferens were investigated using the purinergic and adrenergic antagonists suramin and prazosin respectively and an analysis of their effects on the two halves of the vas (prostatic and epididymal) using 10 Hz tetanic stimuli (n = 6 for all cases). Prazosin reduced the second phase of the contraction in the postastic half (52.1 ± 2.7%) more profoundly than the first phase (20.3 ± 3.9%). Similar results were obtained for the epididymal (15.2 ± 1.2% reduction in first phase, 59.0 ± 1.4% in second phase). Suramin significantly inhibited both phases of contraction in both halves of the tissue (by 55-60% for the first phase and 60-70% for the second phase). In guinea pig vas deferens and in some vascular tissues it has been shown that the first phase of the biphasic response is purely purinergic in nature while the second phase is purely adrenergic. Present results from rat vas deferens show that unlike other systems, in rat vas deferens the first and second phase may not be exclusively purinergic and adrenergic.

PH - 12 HYPOGLYCEMIC AND ANTIOXIDANT EFFECT OF AEGLE MARMELOS LEAVES IN ALLOXAN INDUCED DIABETIC RATS

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*Dept. of Biochemistry, **Dept of Physiology, Kasturba Medical College, Manipal - 576104

Oxidant damage is responsible for many of the complications in diabetes mellitus. The study was
performed to evaluate the hypoglycemic and antioxidant effect of aqueous extract of Aegle marmelos leaves on alloxan induced diabetic rats. Male albino rats were divided into three groups.

Group I (n=9) : Normal Controls
Group II (n=8) : Alloxan induced diabetic rats
Group III (n=9) : Alloxan induced diabetic rats administered aqueous extract of Aegle marmelos leaves.

At the end of four weeks, the plasma glucose, erythrocyte malondialdehyde (MDA) and erythrocyte glutathione (GSH) were estimated in all the groups. It was observed that there was a reduction in the blood glucose levels at the end of four weeks in the treated group (Group III). There was also an increase in erythrocyte GSH and a decrease in erythrocyte MDA in Group III when compared to Group II. The plasma glucose levels were estimated at the end of first, second and fourth week following administration of the extract in Group III animals. It was observed that there was a significant reduction in plasma glucose at the end of second week, however, a further decrease in the plasma glucose level was not observed in Group III animals after the second week.

Aqueous extract of Aegle marmelos leaves has significant hypoglycemic and antioxidant activity.

PH - 13 FORMATION AND FATE OF MULTINUCLEATE GIANT CELLS IN TAMOXIFEN CITRATE INDUCED MALE REPRODUCTIVE TOXICITY IN RAT

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Multinucleate giant cells are common pathologic findings in the testis, caused by a variety of agents. Formation of multinucleate giant cells in the rat testis is multifacial, as a manifestation of malfunction of the seminiferous epithelium. Generally they are formed by senescence, pathogenic toxicants and traumatic or experimental stress. A variety of chemical toxicants like cobalt, synthetic retinoids, tri-o-cresyl phosphate, alcohol, estradiol benzoates and catecholestrogens were reported as the potent testicular toxicants inducing multinucleate giant cells in the testis.

Similar cells appeared in the tubular lumina or rats treated with 5-fluorouracil and tamoxifen in our previous studies. The exact mechanism of formation and fate of these abnormal cells is not known. Hence the objective of this study was to address the formation, morphology and fate of multinucleate giant (symplasts) cells in the rat testis exposed to tamoxifen citrate. Rats were sampled on d 3 or d 15 after the last dosing. Rats were anesthetized with pentobarbital sodium, 40mg/kg. A laparotomy was performed and the testis along with the epididymis were removed and immersed in Bouin’s fluid for 10h. Testis and epididymis were cut into 3mm-4mm thick blocks and epididymis were processed for paraffin embedding, 5 micron sectioning, periodic acid-Schiff’s reaction - haematoxylin and H & E staining. Microscopic observation of the testis revealed the presence of multinucleate cells in the seminiferous epithelium, lumen of tubules. The multinucleate giant cells exhibited 3 to 8 nuclei with an incidence of 2 to 10/tubule. The nuclei of these multinucleate cells were similar to spermatid nuclei with margination of chromatin. Few of these cells were in the process of degeneration. Further observation of epididymes section revealed degenerating multinucleate cells. These results indicate that, tamoxifen citrate induces the formation of multinucleate cells as a result of cell union and degenerated in the testis and epididymes due to phagocytosis.

PH - 14 POTENTIATION OF THE ANALGESIC EFFECTS OF PENTAZOCINE BY NIFEDIPINE DURING CHEMICAL AND THERMAL PAIN IN RATS

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Das, S. Prof. and Head of the Dept. Pharmacology AMC, Dibrugarh

Objective: The study assessed and compared the analgesic efficacy of pentazocine (a kappa (k)
Materials and Methods: The study was done on two groups, each of 10 adult albino rats, of either sex and of similar weights. The control group received distilled water subcutaneously; the test group received pentazocine lactate (10mg/kg), nifedipine (5mg/kg) and combinations of pentazocine and nifedipine at monthly intervals, all in the volume of 10ml/kg. The thermal pain stimulus was placement on a hot plate maintained at a temperature of 55 ± 0.5°C and chemical pain stimulus was the intra peritoneal injection of 1% glacial acetic acid. In the hot plate test, the latency period was observed and in the chemical pain, the writhing response was observed.

Results: Values of confidence Interval and student's t test showed that pentazocine is a moderately efficacious analgesic in chemical pain and affords poor analgesia in thermal pain. Nifedipine alone, also has negligible analgesic effect in both pain models, but remarkably increases the analgesic efficacy of pentazocine synergistically in both cases.

Conclusion: Results of the study suggested that calcium channel blockers are ineffective analgesics individually, but can synergistically increase the analgesic efficacy of an otherwise ineffective dose of a kappa opioid agonist like pentazocine. So possibilities exist for a potent therapeutic use of this interaction.

Key words: Pentazocine, nifedipine, calcium channels (k) opioid agonist, hot plate test, writhing test.

PH - 15 EFFECT OF CIGARETTE SMOKE AND ETHANOL ON MEMORY AND LEARNING ABILITY OF ALBINO RATS.

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Smoking and drinking have become an integral part of our lifestyle. Memory and learning play a very important role in every task we perform. In this project we made an attempt to assess the effects of these vices on learning ability and memory in rats with the help of eight arm radial open maze.

The animals were divided into 3 groups (n=8 in each group)
Gr. - I - control
Gr. - II - Rats exposed to cigarette smoke
Gr. - III - Rats on ethanol consumption 3.2%

The parameters for testing memory were as follows:
1. Reference memory error (RME)
   If the rat entered a non-goal compartment.
2. Working memory errors (WME)
   If the rat re-entered a goal compartment after the eating the food from that compartment.
3. Latency - the time taken by the rat to finish all the 4 pallets from the goal compartments or maximum time i.e. 5 minutes.

There was learning impairment in both the experimental groups as compared to control. Even low concentration of ethanol and exposure to smoke for only half an hour had detrimental effect on learning ability.

PH - 16 STUDY OF ANTI-DIABETIC EFFECT OF CERTAIN INDIGENOUS DRUGS ALONGWITH OTHER PHARMALOGICAL ACTIVITY

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This study was conducted with the aqueous extracts from the leaves of Ocimum Sanctum (Tulsi), Azadarachta India (Neem) and Vinca Rosea (Nayantara). The aim of the study was to observe the Anti-Hyperglycemic effect of these drugs on blood glucose levels of Alloxan induced diabetic rabbits and also
to see if these drugs have any pharmacological effect on different organs and tissues. The whole study was divided into two parts. First part was to study the effect of drugs on blood glucose levels. This part of the study was conducted on rabbits were divided into control treated with saline, diabetic treated with saline, diabetic treated with tulsi, diabetic treated with neem and diabetic treated with nayantara. The rabbits were first made diabetic with Alloxan administered intraperitoneally. Rabbits with moderate diabetes only were taken for the study, as the herbal preparations are as evidenced, not effective in severe diabetic conditions of Blood Sugar Level above 250mg/dl. (Dinesh Puri in India Journal, Physiology Pharmacology 42(3), 1998. The blood from the rabbits were drawn from the marginal ear veins and blood sugar level estimated using estimated using Folin Wu method and rechecked with an Autoanalyser. The blood sugar level was studied for four hours on the first day and then every week for four weeks. The extracts were given daily with the help of a feeding tube in requisite amount.

The Anti Diabetic effect was observed with all the drugs used in the study. The fall of blood sugar level was observed within the first hour in animals treated with tulsi. The mean fall was 15mg/dl. The decline in blood sugar level is gradual and persisted till four weeks. The p value using paired t test on statistical analysis showed the value to be <0.05, which is significant. The tulsi plant has been reported to contain various alkaloids, glycosides, tannins, saponin and many other compounds (R D Gonapati, Chemical Composition of Ocimum Sanctum) that remains to be identified and any of these substances could be responsible for the hypoglycemic action of the plant. There is a report that tulsi leaves inhibit absorption of glucose from the intestine (G. Janebi et al Ind. J. Nutr. Dieter. 1987; 24 : 337-41), but the nature of active principal and exact mode of its action remain unclear. The second drug that was used in this study is Neem: It also reduced blood sugar level. The fall within the first hour was less than that observed with tulsi. In the first hour, mean fall was only 8mg/dl. The drug is effective after four hours of administration and also after four weeks of administration. The p value obtained is <0.05, which is significant, It has been reported that neem prevented glucose-induced hyperglycemia and adrenaline induced hyperglycemia. (K. Satyanarayana & other in IJPP, vol. 10 No. 3, July-Sept., 1978).

The group of diabetic rabbits treated with nayantara showed reduction in blood sugar levels. But the effect is very less after first hour, as compared with other two drugs; the effect was seen more marked after 2 hours of administration of the drug. The decline was more pronounced after one week of treatment and at the end of four weeks the blood sugar level came down to a significant level. The drug thus was effective after prologed use. The p value for all the tests was <0.05, which is significant. Neem has the action which potentiat the hypoglycemic effect of insulin. The syrupy alkaloid, resin and essential oil reported by Chopra et al. may be either totally or partially responsible for the effects observed. Vincristine and Vinblastin obtained from the leaves cannot be ruled out to have antihyperglycemic properties, although they have been marketed as Anti-leukemic agents (Science & Culture, 46, 251-2, 1980).

The second part of our study was undertaken to observe the pharmacological effects of these herbal drugs on different tissues and organs, the study revealed that Tulsi and Neem were inert in studies with Gunieapig ileum. Nayantaram though showed mild contraction of the muscle akin to Histamine, but the effect was insignificant as no further increase in effect was observed in higher administration of the drug. These drugs were inert to the Rat uterus. The drugs were observed to produce no effect on Mammlian heart and respiration as done on Dog. The drugs were inert to Toads heart as there was no difference in the rate and amplitude of contraction after administration of these drugs. These drugs were neither vasoconstrictor nor vasodilator. These drugs have no effect on the skeletal muscle of the Toad. These drugs produced no toxic effects and were well tolerated.

So, it is concluded that Tulsi, Neem and Nayantara all have Anti-Diabetic property and do not possess any other pharmacological effect on laboratory animals. With full recognition of the danger of accepting these results in Rabbits as valid for Human subjects, attentions is drawn for further studies. A clinical study could be undertaken where findings of the present study could be co-related and a definite conclusion may be obtained.
**INFLUENCE OF ISOSORBIDE 5-MONONITRATE (ISMN) AND ISOSORBIDE DINITRATE (ISDN) OF THE HYPOGLYCAEMIC ACTIVITY OF GLICLAZIDE IN RATS**

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The organic nitrates are known to alter the release of insulin through nitric oxide (NO) related mechanism. The sulphonylureas are known to influence the insulin release by blocking potassium channels. Since their combination therapy is required in chronic type-II diabetics that also suffer from angina, the present study was conducted to find out the safety of their combination with respect to blood glucose in rats. Two groups of five rats each were given 2mg/kg body weight gliclazide, orally. After one week washout period 1.8mg/kg body weight of ISMN and ISDN were given to first and second group orally alone. Similar treatment was given prior to gliclazide after a further washout period of one week. Blood samples were withdrawn in all the experiments at 0, 1, 2, 3, 4, 6, 8, 10 and 12 hr by retroorbital puncture and were analysed for blood glucose content by GOD/POD method.

Therapeutic dose of gliclazide produced a biphasic reduction in blood glucose level with a maximum effect at 1st and 2nd hour intervals. ISDN did not produce any change when given alone or in combination with gliclazide. Treatment with ISMN alone reduced the blood glucose with a maximum reduction of 36.67% at 6 hr and reduced hypoglycemic effect of gliclazide at 1st and 2nd hr but dose not alter its response at 6 hr. The study indicates that in a clinical situation ISDN is a better choice than ISMN when administered with sulphonylureas particularly with gliclazide. The pharmacokinetic studies and estimation of plasma insulin level for ISMN interaction with gliclazide are under investigation to establish the mechanism.

**INFLUENCE OF L-ASCORBIC ACID ON TOLBUTAMIDE INDUCED HYPOGLYCAEMIC ACTIVITY IN NORMAL AND DIABETIC RATS**

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The present study was conducted to find out the influence of AA on the hypoglycaemic effect of tolbutamide in normal and diabetic rats. Different doses of tolbutamide (10, 20, 30, 40 mg/kg body weight, orally) and different doses of AA (20, 40, 60 and 80 mg/kg body weight, orally) were tested for their hypoglycaemic effect in normal and diabetic rats. A sub maximal dose (20mg/kg body weight) of tolbutamide was selected for interaction study. 60 mg/kg body weight and 40 mg/kg body weight of AA were selected to study their influence on tolbutamide activity in normal and diabetic rats respectively.

A group of 5 rats were administered orally with tolbutamide 20 mg/kg body weight. After a washout period of one week the same group were administered orally with 60 mg/kg body weight of AA, 30 mins prior to tolbutamide. Similarly the influence of 40 mg/kg body weight of AA was studied in alloxan (100mg/kg body weight of I.P) induced diabetic rats. Blood samples were collected at 0, 1/2, 1, 1.5, 2 & 4 hr in all the treatments by retro-orbital puncture and were analysed for blood glucose by GOD/POD method. A dose dependent reduction in blood glucose level was observed in normal and diabetic rats with both AA and tolbutamide. The peak effect was found to be between 0.5 and 1.5 with AA and 4 hr with tolbutamide. The hypoglycaemic effect was returned to normal by 6 hr with both AA and tolbutamide. In the presence of AA the hypoglycaemic effect and antidiabetic effect of tolbutamide were early in onset and maintained up to 4 hr and returned to normal by 6 hr. It indicates that AA can be used as supplemental drug for immediate onset and prolonged duration of action of sulphonylureas and thereby for proper control of blood glucose.
A study was conducted in albino rats to find out the effect of potassium channel openers nicorandil and minoxidil sulfate on the hypoglycaemic activity of gliclazide. Albino rats of either sex weighing between 255 gm and 375 gm were divided into two groups each consisting of 5. The study was conducted in three phases with a washout period of one week between each phase. In the first phase of the study gliclazide was administered at the dose of 2 mg/kg body weight, orally to both group-I and group-II. In the second phase 1.8 mg/kg body weight of nicorandil and 0.4 mg/kg body weight of minoxidil sulfate were administered orally to group-I and group-II respectively. Similar treatments were repeated 30 min prior to gliclazide in phase-III. Blood samples were collected at 0, 1, 2, 3, 4, 6, 8, 10 and 12 hr intervals by retro-orbital puncture in all the treatments and were analysed for blood glucose by GOD/POD method.

Gliclazide at the dose of 2 mg/kg body weight, orally produced hypoglycaemic effect with maximum effect at 1 hr and 8 hr intervals. Nicorandil alone produced a significant rise in blood glucose level with a maximum effect of 35.40% at 4 hr interval and when administered in combination with gliclazide, there is a decrease in the effects of both drugs. Minoxidil sulfate produced a decrease blood glucose level with a maximum effect of 26.89% at 4 hr interval and when administered in combination with gliclazide there is no alteration in the effects of the both gliclazide and minoxidil. The rise in blood glucose level with nicorandil may be due to its potassium channel opening activity that causes inhibition of insulin release. The gliclazide being hypoglycaemic and nicorandil hyperglycaemic, the effects are mutually antagonistic as expected since they are receptor antagonists at potassium channel. The hypoglycaemic effect of minoxidil sulfate is unexpected. It could be due to extra pancreatic mechanism which is not related to insulin. As a result it does not seem to antagonize insulin related activity of gliclazide. To explain the differential action of nicorandil and minoxidil on blood glucose further work is needed which involves insulin blood level, peripheral glucose uptake etc.

PH - 20
ISOLATION OF NEUROTOXIC AND CARDIOTOXIC FRACTIONS IN INDIAN RED SCORPION VENOM
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The present investigation was undertaken to isolate the active and lethal principles in Buthus tamulus (BT) venom. The lyophilizer crude BT venom (Haffkine Institute, Mumbai) was loaded on sephadex gel column (G-75) and fractions were eluted with 0.1 M ammonium acetate buffer at pH 8.4. The eluted fractions were screened for optical density (at280 nm), lethality, cardiotoxicity and neurotoxicity. Elutes between 56ml and 96 ml demonstrated biological activity and were pooled together (SP). Then the SP was loaded to the cation exchanger column containing carboxy methyl cellulose. The fractions were then eluded with increasing concentrations of ammonium acetate buffer (0.2 - 1.0 M) at pH 6.7. Fractions eluted with 0.2 M buffer demonstrated activity between 150 - 200 ml (T1) The T1 exhibited low neurotoxicity as well as cardiotoxicity and was not lethal indicating unadsorbed proteins. Fractions eluted with 0.3 M buffer showed two peaks of biological activity. The first peak appeared between 190 - 340 ml and the second was detected between 375 - 400 ml of elutes. The elutes of first and second peak were pooled separately and designated as T2 and T3, respectively. The T2 exhibited greater neurotoxicity and low cardiotoxicity while T3 exhibited greater cardiotoxicity but low neurotoxicity. On SDS-PAGE T2 and T3 exhibited prominent bands at 20-22 kDa and 100-120 kDa, respectively. Fractions eluted with 0.5 M or
greater concentrations of buffer did not show any biological activity hence they were not assessed further. The present study reveal two potent toxic principles from BT venom, a low molecular weight neurotoxin and a high molecular weight cardioxin. The cardiotoxic fraction was more lethal and may be responsible for the cardiopulmonary toxicity of BT envenomation.

PH - 21  THE EFFECT OF FEW SELECTIVE COX-2 INHIBITORS ON KAO-LIN INDUCED ARTHRITIS IN ALBINO MICE
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Cyclooxygenase - 2 (COX-2) inhibitors constitute a new group of Non Steroidal Anti-inflammatory drugs. There are two distinct isoforms of Cyclo-oxygenase, COX-1 and COX-2. COX-1 is expressed in any tissues where it regulates physiological functions such as gastric cytoprotection and maintenance of normal renal functions. COX-2, an inducible form is upregulated at sites of inflammation. In this study the effect of COX-2 inhibitors, Celecoxib and Rofecoxib was seen on arthritis induced by Kaolin in Albino mice. Albino mice were randomly selected and was divided into 4 groups. Group I was taken as control, Group II received a standard drug, Group III received Celecoxib and Group IV received Rofecoxib. Sterile suspension of 10% Kaolin was injected directly into the tibio tarsal joint of the Albino mice. Measurement of the joints are repeated 1 hr after the injection of Kaolin and every 24 hrs. The COX-2 inhibitors are given orally 1 hr after Kaolin injection and observed for 6 days. The study showed that the selective COX-2 inhibitors showed a reduction in arthritis induced by Kaolin in comparison to the control and standard agent. The findings of the present study clearly indicates that the drug has antarthritic activity.

NEUROMODULATORY EFFECT OF AZADIRACHTA INDICA ON CEREBRAL POST-ISCHEMIC REPERFUSION AND HYPOPERFUSION IN RATS
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We assessed the effect of Azadirachta Indica (A. indica), a plant that has been reported to possess antioxidant, anti-inflammatory and anxiolytic properties, on cerebral reperfusion injury and long term cerebral hypoperfusion. When blood flow to brain region that has undergone critical period of ischemia is reestablished, additional injury is to be expected from the reperfusion. In present study, bilateral common carotid artery (BCCA) occlusion for 30 min followed by 45 min recirculation resulted in increase in lipid peroxidation, superoxide dismutase (SOD) activity and fall in total tissue sulfhydryl (T-SH) groups. A indica pretreatment (500 mg/kg/day X 7 days) attenuated the reperfusion induced lipid peroxidation, increased SOD activity and fall in T-SH groups. Moreover, A indica per se increased brain ascorbic acid levels, which were unchanged during reperfusion insult. Long-term cerebral hypoperfusion induced by permanent BCCA occlusion has been reported to cause behavioral and histopathological abnormalities. In present study, as tested ny open field paradigm and Morris' water maze, a propensity towards anxiety and disturbances of learning/memory were observed in animals subjected to hypoperfusion for 2 weeks. A indica (500 mg/kg/ day X 15 days) significantly reduced these hypoperfusion induced functional disturbances. Reactive changes in brain histology like gliosis, perivascular lymphocytic infiltration, recruitment of macrophages and cellular edema as a result of hypoperfusion were also attenuated effectively by A.indica. We conclude that, our study provides an experimental evidence for possibility of A indica as a neuroprotective agent.
Keywords: Azadirachta indica, reperfusion injury, oxidative stress, cerebral hypoperfusion, anxiety, learning and memory.
PH-23 **EFFECT OF SILYMARIN ON HEPATOTOXICITY INDUCED BY ANTI-TUBERCULAR DRUGS**


Departments of Pharmacology*, Pathology** and Biochemistry***

Pt. B.D. Sharma PGIMS, Rohtak

**Abstract**

Antitubercular drugs isoniazid (INH), rifampicin (RMP) and pyrazinamide (PZA) are well known hepatotoxic. Present study evaluates the effect of silymarin (a flavonolignan from silybum marianum) a well known antioxidant substance in INH, RMP and PZA induced liver toxicity in rats. Hepatotoxicity was induced by daily administration of INH (7.5 mg/kg, po), RMP (1.0 mg/kg, po) and PZA (35 mg/kg, po) for 45 days. Albino rats of either sex weighing 200-250g were divided into three groups of 6 rats each. Group 1: Control (Vehicle), Group II: INH + RMP + PZA, Group III: Silymarin (50 mg/kg po) + INH + RMP + PZA daily for 45 days. Blood samples were taken before and after 45 days of drug treatment to assess the liver function. Liver biopsy was done at the end of study for histological study.

INH + RMP + PZA resulted in a significant (p<0.05) increase in serum levels of transaminases (AST, ALT), alkaline phosphatase as well as serum bilirubin while serum proteins were found to be markedly reduced. Silymarin significantly (p<0.05) reduced the elevated levels of these transaminases, alkaline phosphatase and serum bilirubin. However serum protein was found to be increased in silymarin treated group. Liver necrosis which was observed in antitubercular drug treated rats was not seen in animals which had received silymarin along with antitubercular drugs.

CVS - 01 **ANALYSIS OF PEAK MODAL FLOW VELOCITY IN THE ASCENDING AORTA IN NORMOTENSIVE AND HYPERTENSIVE SUBJECTS.**

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Factors that predict the magnitude of peak flow modal velocity in the ascending aorta have not been elicitated. It has been assumed that in ascending aorta, the diameter, the pressure gradient, Reynold's number, Critical Oscillatory Reynold's Number (C.O.R.N.) influence the peak flow modal velocity.

The present study was undertaken to determine the relationship between the above factors and the peak flow modal velocity & also to analyse the effect of hypertension on the peak flow modal velocity. This study reflects on,

1. Effect of hypertension on peak flow modal velocity.
2. Effect of ascending aortic diameter on peak flow modal velocity.
3. Effect of Reynold's number and C.O.R.N. on pressure gradient across the ascending aorta.
4. Effect of hypertension on pressure gradient in hypertensives without left ventricle hypertrophy.

Ascending aortic velocity tracings and diameter were obtained in 25 hypertensives and compared with 25 normotensive subjects using Doppler echocardiography. Using standard formulations, Reynold's number & C.O.R.N. were computed.

The study reveals that there is a relationship between the peak modal flow velocity and the factors studied, also there is a definite relationship between hypertension and pressure gradient across the ascending aorta in absence of left ventricle hypertrophy.
CVS - 02  AN ALTERED LIPID PROFILE, A RISK FACTOR FOR CORONARY HEART DISEASE IN POSTMENOPAUSAL WOMEN OF MANIPUR.

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Post-menopausal women are believed to have a higher risk of coronary heart disease than pre-menopausal women. In this study, we prospectively determined changes in clinical and lipid profile that were attributable to natural menopause in a random based sample of 450 healthy women (155 pre-menopausal and 295 post-menopausal) ranging in the age group of 20-60 yrs. Anthropometric measurements, blood pressure and serum lipids were analysed using standard procedures. The ratio of total cholesterol and HDL-Cholesterol, LDL-Cholesterol and HDL-Cholesterol were measured. There were no significant differences for anthropometric variables between post menopausal and pre-menopausal women. Postmenopausal women had significantly higher levels of blood pressure, pulse rate, serum cholesterol, triglycerides, low-density lipooprotein cholesterol, VLDL and the ratios of total cholesterol : high - density lipoprotein cholesterol and low - density lipoprotein cholesterol : high density lipoprotein cholesterol as atherogenic indices than pre-menopausal women. However, the variations of these parameters were not statistically significant although the prevalence of hypertension, hypercholesterolaemia, hypertriglyceridaemia and atherogenic indices was greater in post-menopausal women. This study confirms a higher prevalence of risk factors for coronary heart diseases among women in older age group and suggests that when oestrogen production ceases in menopausal women, the risk of coronary heart disease increases.

CVS - 03  EFFECT OF POSTURE ON CARDIOVASCULAR FUNCTIONS IN UNDERNOURISHED CHILDREN

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Undernutrition is the leading cause of morbidity and mortality in children throughout the world. Nervous system including the autonomic nervous system gets affected in undernourished children. Since the literature on the mechanisms underlying cardiovascular dysfunction in undernutrition is deficient, we planned to study the effect of change of posture on cardiovascular functions in undernourished children. 50 male children were recruited for the study and divided into two groups, Group I consisted of 25 undernourished boys (age 10±2 y, BMI 11.5 - 13.5 kg/m²) and Group II consisted of 25 age-matched normally nourished (control) boys (BMI 13.6-16.5 kg/m²). Heart rate, blood pressure and cardiac autonomic function tests like RR interval variability & deep breathing difference as well as systolic time intervals were recorded in supine and 70° head-up tilt. Except PEP/LVET ratio which is the important measure of systolic time intervals, other parameters did not show any statistically significant difference between the groups in supine as well as upon tilting. A decreased PEP/LVET ratio in undernourished children during head-up tilt might be due to the altered sympathetic cardiac response. It is concluded that these cardiovascular functions during supine rest and during head-up tilt of short duration do not differ significantly in the borderline undernourished children as compared to controls except for a significant decrease in PEP/LVET ratio in the undernourished children upon tilting. Further studies involving severely malnourished children and recording advanced tests of cardiac autonomic activity like heart rate variability for longer duration of postural challenges well shed some more light on this subject.
CVS - 04  CORRELATION OF MEAN BLOOD PRESSURE (MBP) WITH BRAINSTEM AUDITORY EVOKED RESPONSES (BAER) IN NORMOTENSIVE AND HYPERTENSIVE SUBJECTS
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The present study was carried out to see whether there is correlation between brainstem auditory evoked responses (BAER) in normotensive & hypertensive subjects with mean blood pressure (MBP). Brainstem auditory evoked responses were recorded from Cz-A1 & Cz-A2 Scalp region in 37 normotensive and 27 hypertensive subjects. We have reported earlier that BAER in patients of grade I and II hypertension did not show any changes when compared to normotensive subjects. However grade II hypertensive subjects showed significant delaying of absolute peak latencies of wave I, II, V and inter peak latencies (IPLs) of wave III - V indicating involvement of brainstem auditory pathways in severe hypertensive subjects. The other significant finding was the correlation between blood pressure parameters and absolute peak latencies (APLs) of wave I, II and V in hypertensive subjects. Multiple regression showed significant correlation of rise in systolic & diastolic blood pressure with absolute peak latencies of BAER in primary hypertensive subjects.

In our present study it has been further found that significant correlation between mean blood pressure & Absolute Peak Latencies of wave I, IV, V and IPLs of BAER wave I-V, III-V and amplitude I existed in primary hypertensive subjects. This study indicates that mean blood pressure regulatory mechanism in the brainstem interact auditory brainstem pathway. Increase in mean blood pressure delays sensory conduction in auditory pathway.

CVS - 05  CORRELATION OF ASCORBIC ACID LEVEL AND AUTONOMIC FUNCTION IN PATIENTS OF ESSENTIAL HYPERTENSION
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Forty male patients of 30-50 year of age with mild to moderate essential hypertension were selected from Lok Nayak Hospital after obtaining an informed written consent. They were randomly assigned into 2 groups. Group I patients were given Amlodipene (5mg. O.D) and Group II were given both Amlodipene (5mg O.D) and Ascorbic acid (1000mg O.D). Amlodipene is calcium channel blocket and can improve endothelium dependent vasodilatation. Ascorbic acid is most effective physiological antioxidant and is important for protection against diseases caused by oxidative stress.

Various autonomic test like Resting heart rate, standing to lying ratio, 30:15 ratio, valsalva ratio, handgrip test, cold pressor response, Deep breathing tests and serum ascorbic acid levels were evaluated before medication and three months after medication in both groups. Beneficial effects of Amlodipene was statistically significant for parasympathetic as well as for sympathetic functions. Ascorbic acid showed an increased level in follow up cases after three months of medication in which only Amlodipene was given (group I). This clearly indicates the correction of oxidative stress which is associated with essential hypertension. The reason for this stress is obscure but is charaterized by deficient or altered vasomotor responses to stimuli or autonomic dysfunction.

CVS - 06  A COMPARATIVE STUDY OF CARDIOVASCULAR RESPONSES TO HANDGRIP EXERCISE IN DIFFERENT PHASES OF MENSTRUAL CYCLE.
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This study was conducted on twenty healthy females in the age group 25-40 years, to see the effect
of hand grip exercise on cardiovascular responses in different phases of menstrual cycle.

An increased cardiovascular response was seen during the menstrual phase. A significant increase was found in diastolic blood pressure after hand grip exercise (p < 0.001) during menstrual phase. No significant difference was noted in heart rate and systolic blood pressure.

This study indicated the possible role of exaggerate vascular tone after hand grip exercise during menstrual phase.

CVS - 07 RELATION BETWEEN SMOKELESS - TOBACCO USE AND BLOOD PRESSURE AMONG YOUNG MEN

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Recent reviews by World Health Organisation indicate the increasing trends in the use of smokeless-tobacco among young men. There is a large body of medical literature that deals with the haemodynamic effects of smoked tobacco and intravenously administered nicotine. But the acute haemodynamic responses and chronic effects of smokeless-tobacco have been neglected as a topic for investigation, especially with regard to hypertension among young men. Our study is on the screening for blood pressure among the chronic users of smokeless-tobacco aged 18 to 25. Comparison was made with non-users of tobacco in the same age group. The findings indicate a direct and positive relation between smokeless-tobacco use and higher blood pressure readings among young men. This may also hold true in the other segments at population in which the use at smokeless-tobacco is at growing magnitude.

CVS - 08 STUDY OF RISK FACTORS AND INFLAMMATORY MARKERS IN THE PATIENTS OF PRTMATURE ISCHEMIC HEART DISEASE

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Objective/Background: Prevalence of coronary artery disease has increased steadily in our country. Since inflammation is believed to have role in pathogenesis of cardiovascular events, measurement of makers of inflammation has been proposed to improve the prediction of risk of these events.

Material and Methods: Blood samples of 25 control, 25 unstable angina patients and 25 patients of myocardial infarction were analysed. C-reactive protein, ASO titer, TLC, ESR, Lipid profile and Homocysteine were measured. Stepwise linear discriminant analysis was used to find the important risk factors for premature ischemic heart disease. CRP by agglutination method using CRP latex kit, ASO titre by rapid latex agglutination test kit. TLC by haemocytometry. ESR by westergren method, homocysteine by chemiluminescence, triglycerides by enzymatic kits, HDL-cholesterol by semi auto analyzer.

Results: The C-reactive protein, ASO titre, TLC and ESR were higher in acute myocardial infarction (3.74 ± 2.78 mg/dl, 320 ± 300 IU/ml, 9868 ± 2500/Cu mm and 31 ± 29 mm in first hour) and unstable angina (3.88 ± 5.2 mg/dl, 256 ± 135 IU/ml and 10.293 ± 2541/Cu mm, 36 ± 28 mm in first hour) than control (0.69 ± 0.22 mg/dl, 216 ± 53 IU/ml and 8173 ± 1720/Cu mm, 22 ± 16 mm in first hour). The serum cholesterol (p<0.0002) and LDL (0.05) were significantly higher in CHD patients while HDL was significantly low (<0.05) in CHD patients. Homocysteine levels were significant high (<0.05) in unstable angina patients.

Conclusion: Clinical significance of inflammatory markers i.e., C-reactive protein, TLC, ASO titre, ESR Lipid profile and homocysteine is determining the risk of premature IHD has been observed.

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**** Assistant Professor, Department of Medicine
CVS - 09 BLOOD PRESSURE PROFILE OF SCHOOL GOING CHILDREN

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The assessment of blood pressure in children and adolescents is of great importance in order to gain a better understanding of its pattern of evolution. The purpose of this study was to know the blood pressure pattern in the age group of 10-15 years, school going children in and around the Dibrugarh town as well as to know the blood pressure pattern in relation to body weight and height in the above age group.

In this study 600 school going children were studied in a period of one year from July 2001 to June 2002. An equal number of children in each age and sex were taken. Correlation analysis and its associated tests were also performed and an attempt has been made to study how systolic and diastolic blood pressure of above age group children behaved after the variation in some important blood pressure affecting variable such as age, sex, height, weight and body mass index etc.

It was observed that both systolic and diastolic blood pressure increases steadily with increasing age in both the sexes and values of both systolic and diastolic blood pressure were slightly higher in female as compared to male. The systolic and diastolic blood pressure of each age group was significantly different from the other (P<0.001) in both sexes. The increment of blood pressure were significantly related to height (P<0.05), weight (P<0.05) and BMI (P<0.05).

Both mean pressure and pulse pressure were also seen to be rising gradually in both the sexes with increasing age, height, weight and BMI. Socio-economic status has got some influence on blood pressure.

Values obtained in this study were more or less similar with the other workers from the other parts of the country. But it was slightly lower than the values, which were obtained from other workers of the western countries.

CVS - 10 POWER SPECTRAL ANALYSIS OF HEART RATE VARIABILITY DURING ORTHOSTATIC STRESS AMONGST LOWER LIMB AMPUTEES

Lt. Col KK Tripathi1, Dr. KS Hegde2, Dr. PK Banerjee3, Air Cmde JK Gupta

Background & Objectives :- Conjecturally, lower limb amputees are expected to be more resistant to orthostatic stresses due to diminution of a substantial lower body mass. Earlier, we have reported that HR and BP responses to heat up tilt (HUT), in the lower limb amputees, are comparable to those in normal individuals [APPICON-1999]. The present study was done to examine sympatho-vagal interactions in lower limb amputees during 55° HUT.

Methods :- Power spectral analysis of heart rate variability (HRV) was done during resting supine and 55° HUT using both parametric (Maximum Entropy Method) and non-parametric (Welch Averaged Periodogram Method) techniques in 8 above knee amputees, 9 below knee amputees and 6 age matched controls. Reactions were compared using two way ANOVA with amputation and posture as two factors.

Results :- Tilting resulted into a significant reduction in total (0.04-0.50 Hz), and high frequency (0.15 to 0.50 Hz) power. Change in low frequency (0.04-0.15 Hz) power was not significant in absolute terms. However, low frequency power showed a significant increase when normalised to total power. LF/HF ratio tilted significantly in favour of sympathetics. A significant shift of mean frequency of the LF spectrum was also noted. The above changes were not different in the amputees compared to normal individuals.

Conclusions:- Sympatho-vagal interactions during 55° HUT in the amputees are comparable to those in normal individuals.
Heart rate variability (HRV) has been used extensively as an approach towards quantification of autonomic activity (tone), both in clinical and neurophysiological research. HRV has now been increasingly employed as a prognostic marker after myocardial infarction as well as useful diagnostic tool in many neurological and cardiac disorders. In India we are using imported data acquisition systems and softwares. There is a felt need to develop indigenous data acquisition systems and softwares, both for on-line and off-line analysis. We have developed software to perform HRV using the concept of virtual instrumentation with the help of Lab VIEW 6.1 platform. Virtual instrumentation is defined as combining hardware and software with industry-standard computer technologies to create user-defined instrumentation and medical solutions. We have already developed a software using this technique for Heart Rate Variability (HRV) in which we acquire the ECG signal. We mark the event series of RR intervals and then do the time domain and frequency domain analysis of the RR series. In Virtual Instrumentation we try to keep minimum hardware and all the other requirements like filtering, windowing, interpolation, curve fitting can be done in the software itself. Thus it is very useful as it is cost effective and we can make any changes in the software when needed. We compared the time and frequency domain measures of HRV as obtained through our software as well as with the well established Nevrokard DAS port data acquisition system and software (version 6.4). Continuous ECG was recorded for 5 minutes from 24 healthy adult human subjects (mean age 35.69 ± 10.28, 19 males and 4 females) in Nevrokard data acquisition system and simultaneously the analogue ECG signal was fed to the Lab VIEW virtual instrument via PCI-6035E card. All time and frequency domain measures were calculated from both the softwares and they were compared. All the parameters were highly comparable statistically. The results show that the software developed by us can be used effectively for HRV analysis in a more efficient manner since there is minimum hardware requirement in our system.

Acknowledgement: The study was funded by Ministry of Communication and Information Technology (MCIT)

A COMPARISON OF AUTONOMIC VARIABLE WITH NUTRITIONAL STATUS AMONG REGULAR PLAYERS

Nutritional variables are established determinant of the performance of the players of various games and sports. Changes are also well known in athletes. The objective of the present study was to compare
autonomic parameters at rest and during exercise and the nutritional status of the players of selected games and sports. The data was collected from 38 subjects (age between 17 and 25 years, 24 males and 14 females), players of different games and sports from India Gandhi Institute of Physical Education and Sports Sciences (IGIPESS), University of Delhi. The subjects were classified on the basis of their nutritional status as underweight, balanced weight and overweight. The data was analyzed by computing mean, standard deviation and analysis of variance. The comparison between balanced weight and underweight females on Exercise Heart Rate (BPM), right grip strength (kg), fat percentage (percent), perceived required calorie intake (k cal/day), actual caloric intake (k cal/day) and change in weight during study (± 5 kg) was found to be statistically different at 0.05 level of significance.

In conclusion autonomic variables were found to be significantly correlated with nutritional status. These autonomic parameters should be considered as an important variables and should be incorporated in sports research.

CVS - 13 AUTONOMIC ACTIVITY IN DIFFERENT POSTURES: A NON-LINEAR ANALYSIS (POINCARE METHOD) APPROACH.

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Changes in posture cause hemodynamic alteration, which activate autonomic nervous system so that cardiovascular homeostasis is maintained. Autonomic control on the cardiovascular system has been extensively studied. From the so called “variance era”, basically carried out in the time domain, we passed through the "power spectrum era" in frequency domain. The use of these linear time and frequency domain measures of HRV to assess the autonomic modulation of cardiovascular system has produced different results with different spectral techniques or units. Moreover linear methods failed to explain the chaotic behavior of cardiovascular responses, they assume that steady state responses should be regular and predictable. Non-linear methods have therefore been employed to quantify the beat-to-beat dynamics of RR intervals under different physiological conditions. The aim of the present study was to quantify autonomic activity (Tone) by non-linear analysis of HRV using Poincare method in different postures. Poincare plots consists of each cardiac RR interval plotted a sa function of the previous interval. The line defined as axis 2 shows the slope of the longitudinal axis, whereas axis 1 defines the transverse slope, which is perpendicular to axis 2. Standard deviation is computed around the horizontal axis which passes through the data center (SD1), which shows the instantaneous beat-to-beat variability of the data. Standard deviation is also calculated along axis 1 (SD2), which shows the continuous long-term RR interval variability.

13 healthy, adult subjects (mean age 32 ± 4.6 years, 11 males and 2 females) were subjected to head up tilt (70°), and head down tilt (20°) for minutes and continuous ECG was recorded throughout the duration of the tilt as well as during lying condition. Poincare plot analysis was done using Nevrokard DASport ADC and software (Version 5.05). Head up tilt resulted in significant decrease in SD1 [30.22(0.95-73.58) vs. 24.08 (5.53-65.23) centroid [911.85(848.34-1091.6) vs 794.92(593.11-1033.48), ellipse area [5111.37(696.86-10358.9) vs 4120.85(797.50-19943.01)] and SD1/SD2[0.49(0.4-0.96) vs 0.39(0.42-0.67)], when compared with lying position. This indicates decrease in parasympathetic control over heart. HUT position was also compared with HUT, which resulted in increase in centroid [911.85(848.34-1091.6) vs 863.9(618.12-1094.43)], SD1 [30.22(0.95-73.58) vs 34.83 (9.8-128.75)] and SD1/SD2[0.49(0.4-0.96) vs 0.57 (0.5-1.01)], indicating an increase in parasympathetic control over heart. However there was no significant change when HOT was compared with lying position. Our results indicate that a non-linear analysis approach in the form of Poincare method can be applied to assess the autonomic modulation of the cardiovascular system.

Acknowledgement: The study was supported by Ministry of Communication and Information Technology (MCIT), Govt. of India.
EFFECT OF DIFFERENT POSTURES ON TIME AND FREQUENCY DOMAIN MEASURES OF HRV: A LINEAR ANALYSIS APPROACH

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Changes of posture cause perturbations of the cardiovascular system, which are adjusted so that cardiovascular homeostasis is maintained. Many reflexes, both peripheral as well as central take part in this process. Autonomic nervous system plays an important role in mediating these homeostatic responses and when need arises. Autonomic activity (Tone) is changed in response to prolonged perturbations in the cardiovascular system. The study was designed to assess the changes in autonomic activity as measured by HRV during mild head down tilt (HDT). 13 healthy, adult subjects (mean age 32 ± 4.6 years, 11 males and 2 females) were subjected to head up tilt (70°), and head down tilt (20°) for 5 minutes and continuous ECG was recorded throughout the duration of the tilt as well as during lying condition. Heart rate variability was done using Nevrokard DAsport ADC and software (Version 5.05). Both time and frequency domain analysis of the ECG signal was performed. Data obtained during the lying condition was compared with both head up and head down tilt, as well as data was compared between the two tilt positions. Time domain measures of HRV showed a significant decrease in SDSD, RMSSD, NN50 and pNN50 when lying posture was compared with head up tilt. This suggests a decrease in overall variance in HRV during HUT compared to lying position. LF component of HRV showed a significant increase [38.31 (6.14-75.7) vs 51.41 (18.83-83.59)] and HF component showed a significant decrease [52.63 (20.83-91.18) vs 41.63 (4.83-77.69)] upon head up tilt. Thus there was sympathetic over activity during the head up tilt position. We observed significant increase in SDSD (42.74 (13.33-104.06) vs 49.25 (13.60-182.06)), RMSSD (42.68 (13.31-103.93) vs 49.18 (13.58-181.83)), NN50 count (36.5 (0-116) vs 45 (1.131)) and pNN50 (11.34 (0.29-74) vs 14.67 (1.12-83)) upon HDT compared with HUT. However there was no significant change in all these parameters when 20° HDT was compared with lying posture. Our results show that autonomic balance changes during the changes of postures and they are faithfully reflected in both time and frequency domain measures of HRV.

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COMPARISON OF AUTONOMIC FUNCTIONS BETWEEN PATIENTS OF WELL CONTROLLED AND INTRACTABLE EPILEPSY.

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Previous studies have shown that epileptic patients exhibit varied autonomic responses, either as part of seizure symptoms or as interictal manifestations which possibly result from propagation of electrical impulses from the seizure focus to the central autonomic nuclei. In this study, two groups of epilepsy patients were studied: 1) Those that were under medication and seizure free for at least a period of last three months, i.e. well-controlled (WC) and 2) Those that were intractable, i.e., suffered from recurrent seizures despite optimal treatment under an experienced neurologist over a period of more than one year (IE). Both the groups underwent a battery of autonomic function tests which were aimed at testing their autonomic reactivity. Baseline autonomic activity (tone) was also measured by Heart rate variability (HRV) analysis. Autonomic functions were compared between 18 WC patients (mean age 23.67 ± 12.62, 11
(1.41 ±0.19 vs 1.3 ±0.12), delta HR changes during DBT (26.56 ± 11.5 vs 21.8 ± 8.27), tachycardia ratio (1.3 ± 0.2 vs 1.34 ± 0.14), bradycardia ratio (0.79 ± 0.12 vs 0.7 ± 0.17), 30:15 ratio of the HUT (1.21 ± 0.38 vs 1.1 ± 0.05), except the Valsalva ratio (VR) (1.8 ± 90.44 vs 2.06 ± 0.48), this denotes a trend towards a lower parasympathetic reactivity in the intractable epileptic group. Among the indices for sympathetic reactivity which were studied, i.e. rise in diastolic B.P. during HGT (20.59 ± 8.85 vs 23.6 ± 7.65), rise in diastolic BP during CPT (13.29 ± 8.03 vs 13.56 ± 7.54) exhibited higher values in the IE group. This implies that they have a higher sympathetic reactivity, as compared to the WC group. The study of resting autonomic tone yielded similar results. The time domain measures which give an idea of parasympathetic tone, i.e. SDNN (44.5 ± 927.4 vs 28.96 ± 6.86), SDSD (46.68 ± 34.4 vs 22.58 ± 7.62), RMSSD (46.61 ± 34.35 vs 22.55 ± 7.61), NN50 (11.04 ± 12.74 vs 2.53 ± 2.8) consistently showed lower values in IE group as compared to WC group, which suggests a lower basal parasympathetic tone when compared to the WC group. In the frequency domain measures, LF (nu) (40.13 ± 13.72 vs 45.95 ± 20.47), %LF (30.64 ± 7.57 vs 27.82 ± 3.13) and LF/HF ratio (1.030 ± 1.80 vs 1.43/1.080 showed that the IE group had a higher sympathetic tone while the HF (nu) (46.55 ± 16.86 vs 44.39 ± 19.55), showed that this group also had a lower parasympathetic tone when compared to the WC group. In conclusion the results exhibit a distinct trend, the intractable group had both a higher basal sympathetic tone and sympathetic reactivity when compared to the well controlled group. Although the differences were not statistically significant, further study with a larger sample size is advisable to yield more conclusive results. Further, it is not known whether there are differences in autonomic functions in well controlled and drug resistant epileptics. Thus, the present study is being carried out to find the status of autonomic functioning in well controlled and intractable epileptics.

CVS - 16 ASSESSMENT OF CARDIOVASCULAR AUTONOMIC FUNCTION: AGE AND GENDER RELATED NORMAL VALUES OF HEALTHY SUBJECTS


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The Autonomic nervous system is involved in controlling the vegetative functions of the body. Autonomic Functions Test (AFT) forms an integral part of physiological investigations and is a useful diagnostic tool in neuropsychiatric disorders. However it is essential to establish normative data for the Indian population.

Objective: The Objective of this study was to determine normal values of cardiovascular functions in normal healthy individuals and to determine effects of age and gender on these values.

Methods: A total number of 132 healthy subjects (M=65, F=67), of age 15-56 yrs were subjected to a battery of cardiovascular autonomic function tests using an automated data acquisition system. Heart rate (HR) and blood pressure (BP) responses were recorded at rest and after deep breathing, Valsalva maneuver, postural change and isometric exercise.

Results: Age and weight had a positive correlation with the resting BP. However, age and HR responses to deep breathing and standing posture were negatively correlated. Similarly a negative correlation was also observed between age and BP responses to standing and isometric exercise. Gender differences were noted in some of the responses.

Conclusion: The variations in autonomic functions with age gender will be discussed.

CVS - 17 COMPARISON BETWEEN PRE-PRANDIAL AND POST-PRANDIAL HRV

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After food ingestion, peptides are released in GIT, which cause local vasodilatation. Therefore, after meals, redistribution of blood occurs because of shifting of large amounts of blood into GIT. In normal individuals, this is well compensated and does not lead to post-prandial hypotension. This situation gets exacerbated in Diabetes Mellitus. The mechanism of post-prandial hypotension is not known. We hypothesized that there may be an increase in parasympathetic activity (tone) after meals to compensate for the change in blood distribution. We carried out the study to fine out the change in the autonomic tone before and after meals (lunch) in normal individuals. Heart Rate Variability (HRV) is a proven tool for quantification of autonomic activity (tone). In this study, from the series of RR intervals marked, the time domain and frequency domain measures of HRV were obtained using Nevrokard software (version 6.4). Continuous ECG was recorded in 15 healthy adult subjects (mean age 29.06 ± 6.2; 13 males and 2 females). The ECG was recorded in pre-prandial and post-prandial state for a period of five minutes each as follows: 1st recording taken just before the subjects had lunch; second recording was started 15 minutes after lunch; 3rd recording was taken 1 hour after lunch and 4th recording was done 2 hours after lunch. Time domain and frequency domain measures of HRV were compared between pre-prandial state and rest of post-prandial states. The time domain measures did not show a significant change between the pre-prandial state and the immediate post-prandial state, i.e. 15 minutes after lunch. [Range, i.e., the difference between the maximum and minimum RR intervals (406±161.14 vs 416.66±125), standard-deviation of normal to normal RR interval (56.33±22.72 vs 67.63±26.50), RMSSD (55.02±35.85 vs. 63.87±32.60), NN50 (42.13±29.43 vs. 51.86±29.83), PNN50 (12.67±10.29 vs. 15.27±9.71)]. The frequency domain parameters also did not show change after meals [HF (49.53±15.10 vs. 47.07±16.88), LF (41.41±13.18 vs. 46.49±15.99), LF/HF (0.98±0.53 vs. 1.26±0.90), total power (148.27±37.78 vs. 137.61±37.10)]. No significant change was seen in the time domain and frequency domain measurements between the pre-prandial state and the later phases of post-prandial state. Since there is no significant increase in the time domain measures and the HF value between the pre-prandial and the post-prandial states, we conclude that the parasympathetic tone is not altered. The parameters concerning sympathetic tone, i.e., LF and LF/HF, also do not show a significant change. This indicates that the cardiovascular autonomic tone is not affected by ingestion of meals in normal individuals. Thus we refute our hypothesis. In conclusion, the HRV parameters do not alter significantly after meals in normal individuals.

CVS - 18 IMPROVEMENT OF MYOCARDIAL FUNCTION IN STZ INDUCED DIABETIC RATS BY THE ALDOSE REDUCTASE INHIBITOR: RUTIN, A DOPPLER ECHOCARDIOGRAPHIC ANALYSIS.


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Objectives: To study the Cardioprotective actions of Rutin in Streptozotocin induced Diabetic Rats.

Methods: Diabetes was induced in Sprague Dawley rats by Streptozotocin (45mg/kg/iv). Left ventricular function was evaluated by Doppler echocardiography in anaesthetized, Group - I age matched control rats treated with vehicle (n=6), Group - II : diabetic rats treated with Rutin (50mg/kg/po) (n=6), and Group - III : diabetic rats treated with Rutin (100 mg/kg/po) (n=6) at 2,4,8 and 12 weeks after STZ injection.
Similarly at 4, 8 and 12 weeks serum was collected from the diabetic and age matched control rats, and was analysed for Glucose, Triglycerides, Cholesterol, LDL and total proteins. Histological studies were carried out at the end of 12 weeks.

Results: E-wave (early diastolic filling, early peak velocity) was significantly decreased after 12 weeks of diabetes, and A-wave (late atrial filling, atrial peak velocity) was significantly increased after 12 weeks of diabetes in control rats thus diabetic control animals after 12 weeks had an inversed E/A ratio. No Doppler abnormality (inversed E/A ratio) was found in Group-II and group-III animals. Fructose levels were improved in Group - II and group III animals when compared to diabetic control animals. Histological changes were not found in Group - II and group - III animals when compared diabetic control animals.

Conclusion: Rutin, a potent aldose reductase inhibitor improved the left ventricular diastolic function in STZ induced diabetic rats, suggesting the role of Polyol Pathway in diabetic complications.

CVS - 19 ANTIHYPERTENSIVE EFFECT OF RAW GARLIC

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Garlic has been used as a medicinal supplements since very old times. It has been advocated for use in cardiovascular diseases, free radical scavenging effect and lipid lowering effect. In this study we have given Garlic as a raw empty stomach in-patients of state I hypertension. These patients were followed for six month Blood pressure was recorded. The result showed that garlic is effective in lowering blood pressure both systolic & diastolic. The results were significant statistically. The blood pressure lowering effect was evident even after two months of use of Garlic.

CVS - 20 ASSESSMENT OF CARDIORESPIRATORY, AUTONOMIC AND AEROBIC POWER CHANGES IN RESPONSE TO SHORT TERM PHYSICAL EXERCISE.

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The study evaluated Physiological benefits of moderate intensity short term exercise in 58 sedentary medical students (18-23 years) with respect to Physical fitness index, cardiorespiratory and autonomic responses.

Assessment of nutritional status evaluated that calorie intake of 25.86% undernourished subjects (BMI 16.85±1.061) and 17% overweight subjects (BMI 27.27±1.70) was <64% and >85% of RDA respectively. Remaining subjects were having desired BMI and calorie intake. On assessing preexercise physical fitness, 20.68% subjects (BMI 22.12±6.43) had poor physical fitness score (5.75±2.2). A negative correlation was established between BMI and Physical fitness score in overweight category (r = -0.821, P = 0.001) study population was subjected to a Short term physical training on bicycle ergograph for 15 days.

Cardiorespiratory parameters were recorded Pre and Post exercise. Vo2 max was calculated from Astrand's Nomogram after determining work rate. Heart rate, systolic blood pressure and respiratory rate showed a linear rise while diastolic blood pressure recorded a fall as compared to preexercise values. Sympathetic reactivity as evaluated by diastolic blood pressure response to hand grip test showed decrease at 4th minute (78.0±1.2 Vs. 63±0.2) Parasympathetic activity as evaluated by heart rate variability showed an increase in response though not significant. Aerobic Power (Vo2 max) showed significant improvement with training (1st day 3.19±0.24 V5 15th day 3.44±0.353). A statistically significant increase
in physiological endurance, physical fitness index (1st day 81.40±9.12 V5 15th day 91.16±10.89) was observed. No significant changes in electrocardiogram was recorded. Study suggested that short duration moderate intensity exercise may prove valuable in improving cardiorespiratory fitness.

CVS - 21  HEART RATE VARIABILITY (HRV) ANALYSIS OF CHRONOTROPIC RESPONSE TO ACUTE EXERCISE IN SEDENTARY INDIVIDUALS

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Introduction: HRV is the oscillation in consecutive cardiac cycle length. It is one of the key measurements of the body’s rhythms.

Objective: To study the effects of exercise on HRV in sedentary individuals.

Methods: The study was conducted in sedentary individuals (n = 6) who were not involved in regular physical activity or competitive sports/yoga/any relaxation technique. After 15-min of supine rest three segments of 6-min long EKG was recorded in resting condition, during incremental load exercise and immediately after the exercise. The exercise, starting with a load of 25 W with its increment (25W) every 2 min, was given using automated bicycleergometer. Thereafter successive R-R intervals were measured manually from ECG record in milliseconds. Different time domain HRV parameters such as mean R-R intervals, their standard deviations, square root of the mean squared differences of successive NN intervals, NN50 of all the subjects in all three conditions were calculated. Descriptive statistics was done. All the subjects gave consent for the study.

Results: The result of the subjects were as follows: resting: mean R-R intervals = 1079.2±24, NN50 = 194.5±24, PNN50 = 54.9±13, and RMSSD = 419.1±421. During exercise: mean R-R intervals = 805.4±351.8, NN50 = 108.3±99.5, PNN50 = 31.4±29.6, and RMSSD = 156.6±166.6. During recovery: mean R-R intervals = 721.4±273.1, NN50 85.7±87.1, PNN50 23.3±24.6, and RMSSD 108 ±132.2.

Conclusion: On the basis of the observation in the subjects, it is concluded that time domain parameters of HRV is decreased during exercise and continue to decrease up to 6 min post-exercise.

CVS - 22  EFFECTS OF VITAMIN C ON IN-VIVO LIPID PEROXIDATION

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Evidence from in vitro studies suggests that antioxidant vitamins play a role in lipid peroxidation, which may be important in the pathogenesis of atherosclerosis. Numerous studies in human have investigated the effect of vitamin C on LDL oxidizability in smokers (Steinberg 1998) non-smokers (Jialal 1993), person with hyperlipidemia (Gilligan 1994) and cardiovascular diseases (Mosca 1997). However, in vivo evidence in support of effect of vitamin C or its combination with Vitamin E supplementation on lipid metabolism is sparse. The objective of the present study was to determine the effects of vitamin C on in-vivo lipid peroxidation. The material for the present study was 76 Diabetics, drawn from patients attending Diabetic Clinic, conducted at SMIMER, Surat.

Lipid profiles of all the subjects was done prior to their inclusion in the study and were grouped into type II and I. After base line lipid profile estimation, all the subjects were asked to follow given dietary supplementation for a period of two months. A repeat lipid profile of all subjects was done after completion of dietary supplementation therapy. Subjects who have failed to repeat in time were excluded from the study.
The lipid profiles of all the subjects before and after dietary supplementation therapy were analysed statistically and it was observed that supplementation with vitamin C has an synergistic effect on lipid profile of diabetic patients.

RES-01 COOKING FUELS AND FLOW VOLUME CURVES IN FEMALES OF BHOPAL (M.P)
Siddiqui M., Jain O.P., Yesikar S.S and Haleem K.A

In this study ventilatory functions and respiratory indices were studied in 158 female subjects of age group varying between 20 to 65 years. All the lung function tests were recorded on a computerised spirometer at Pulmonary Laboratory, Department of Medicine Gandhi Medical College, Bhopal. This study was undertaken to observe the effects if any on the lung function of a certain female population of Bhopal who are exposed in their kitchen to the use of different bio-fuels e.g. LPG, Wood, Kerosene and charcoal. The percent of predicted lung function values in females using different fuels showed decrement in lung function tests. The LPG users showed a significant reduction only in FEV1/FVC parameters (p<0.001). In wood users there seems to be greater loss of lung function as FVC, FEV1, FEF25-75 and PEFR were significantly reduced, (P>0.005), (P>0.001), (P>0.005) and (P>0.005) respectively as compared with the use of other fuels reflecting both obstructive and restrictive airways dysfunction. In charcoal users only FEV1 was reduced (P>0.005) and in kerosene users both FEV1 and FVC were reduced, (P>0.005).

It is concluded from this study that there were no readily significantly apparent risks upon lung function from sequential exposure of female subjects to LPG consumption, in comparison with wood, kerosene and charcoal in descending order.

RES-02 Study of \( R_1 \) ratio in pulmonary function test parameters lacking predicted values in Erich Jaeger's Transferscreen II
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Pulmonary Function Test (PFT) parameters like FVC, FEV1/FVC are useful in deciding the obstructive and restrictive disease pattern and highlights its severity. This is possible with the comparison of predictive values. 38 parameters can be studied in spirometry and flow volume using Jaeger's Transferscreen II equipment. 20 parameters have predicted values but the remaining 18 parameters like PIF, FIV and FEV75-85 do not have predicted values. The parameters without predictive values do not give adequate inference and cannot be used for prognosis. These 18 parameters besides the parameters having the predictive values were studied in 139 healthy volunteers and 1190 patients in various pulmonary disorders.

Percentage difference was obtained by taking the ratio of the mean value of any PFT parameter for the abnormal condition to the mean value of the control group. This ratio was termed as \( R_1 \) and it helped to know the severity of the abnormal pulmonary functions in various disease conditions for all the 38 parameters studied.

RES-03 A Comparative study of Exercise induced broncho-lability in siblings of asthmatics and adult 1st degree relatives of asthmatics.
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The present study was carried out in 40 children (Group A) and 40 adults (Group B). In Group A, 20
were normal (A-1) and 20 were siblings of asthmatic children (A-2) in the age group of 7 to 12 years. In group B, 20 were normal adult males (B-1) and 20 were 1st degree relatives of asthmatics (B-2). The subjects were chosen from the relatives of those attending the asthma clinic at L.N. Hospital. The measurement carried out included anthropometric measurements, heart rate (H.R), blood pressure (B.P) and lung volumes (FVC, FEV, PEFR, FEF 25-75%)

After a standard exercise test (Master's 2 steps), HR, BP were noted again and all the respiratory tests were carried out at 0, 5, 10, 15 minutes after exercise in both Group A and Group B subjects. The results showed PEFR and FEF 25-75% to be the most sensitive measurement in both the groups. Also the results were comparable in both the groups in terms of abnormal bronchial lability in Group A - 2 and in Group B - 2, in both case EIB was found to be 25% while in Group A - 1 it was 5% and in Group A - 2 it was 10%.

RES-04 A Study of Pulmonary Profile In Healthy Young Adults
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Pulmonary function testing has been a major step forward in assessing the functional status of the lungs. Normal values of different lung functions are based on population studies and vary according to race, height, weight, age and gender. Several studies have been carried out to measure the lung functions in various parts of India and a wide variation among Indian subjects were observed by different observers.

A pulmonary function testing comprising of vital capacity (VC), force vital capacity (FVC), forced expiratory volume in one second (FEV1), peak expiratory flow rate (PEFR), forced expiratory flow at 25-75% of FVC (FEF 25-75%) were measured among 200 healthy non smokers of Dibrugarh. Physical parameters like age (years), height (cm), weight (kg) and body surface area (sqm) were measured. The date were statistically analysed to find out the mean and standard deviation. The lung functions values in male were founds to be higher than that of females. Among men, VC, FVC, FEV1, PEFR, FEF 25-75% was found to be 3.90 (± 0.60), 3.73 (± 0.64), 3.39 (± 0.60), 7.23(1.6), 4.9(1.1). The corresponding figures in females were 2.99(± 0.44), 2.75(± 0.45), 2.39(± 0.46), 5.28(1.38), 3.92(± 1.02). Correlation coefficient analysis showed a positive correlation of lung functions like VC, FEV1, FEV1 and PEFR with the physical parameters in both male and females. In males the analysis showed better correlation of lung functions with physical parameters (p<0.001) while in female the analysis showed a better correlation of VC, FVC, FEV1 with physical parameters (p<0.001), except PEFR which was not statistically significant (p>0.05).

RES-05 A Study of Pulmonary Function in patients after treatment of Pleural Effusion
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This study was done to assess ventilatory functions in patients after successful treatment of Pleural Effusion. Twenty patients, 18 males, 2 females in the age group 20 - 50 years, who had exudative Pleural Effusion were studied. All receives successful treatment with antitubercular drug during the last 5 years. They came for follow up without any specific chest symptoms. Patients who had associated signs and symptoms of cardiac problems, COPD, Bronchial Asthma, Pulmonary Fibrosis, Ascites or Neuromuscular disease were excluded from the study. Spirometric lung functions such as FVC, FEV1, FEV1/FVC% and PEFR were recorded. The results are mean FVC was 3.15 ± 0.66, compared to the predicted mean of 3.48 ± 0.47, mean FEV1 was 2.62 ± 0.62 compared to the predicted mean of 2.98 ± 0.40, mean FEV1/FVC% was 86.19 ± 8.66% compared to the predicted mean of 85.46 ± 5.88% and mean PEFR was 6.66 ± 3.02 compared to the predicted mean of 7.99 ± 2.10. The findings in this study did not show any significant change from the predicted values showing that the ventilatory functions are preserved.
RES-06 A COMPARATIVE STUDY OF SOME RESPIRATORY PARAMETERS IN PATIENTS HAVING RESPIRATORY COMPLAINTS AND IN NORMAL HEALTHY SUBJECTS.

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In this modern era of air pollution, majority of our population suffers from various respiratory problems, which can be assessed by changes in respiratory parameters. People staying in Ahmedabad city are facing this problem due to heavy road traffic and increasing industrialization. In the present study pulmonary functions of subjects having respiratory problems are compared with those of healthy individuals. We have measured Forced Vital Capacity (FVC), Forced expiratory volume in 1 second (FEV₁) and Peak Expiratory Flow Rate (PEFR) of 120 subjects using computerized Spirometers (KIT-MICRO, COSMED). Out of 120, 90 subjects were in the experimental group which were further divided into 3 subgroups viz. Restrictive pattern, Obstructive pattern & Mixed pattern and the remaining 30 served as control (n=30).

We observed that FVC was significantly lower in restrictive and mixed pattern whereas in obstructive pattern, though it was lower but was non-significant. FEV₁ & PEFR were found to be significantly lower in all three subgroups of patients suffering from respiratory complaints. The physiology basis of these changes found in different respiratory parameters would be discussed in detail at the time of presentation.

RES-07 AIR POLLUTION AND PULMONARY FUNCTION TEST (VENTILATORY) IN SHOP-KEEPERS IN HEAVILY POLLUTED AREAS OF JAIPUR CITY

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60 Shop-keepers - 30 from heavily polluted and 30 from low polluted areas of Jaipur city matched on sex & SES were studied to find out the effect of air pollution on Pulmonary Function Test (Ventilatory). Medspiror was used for Pulmonary Function Test. Result revealed that parameters of Pulmonary Function Test i.e. Forced Vital Capacity, Forced expiratory Volume in one sec., Forced expiratory Flow Rate and Maximum Voluntary Ventilatory were significantly influenced by air pollution.

RES-08 Comparision of Pulmonary Function tests in COPD (Chronic Obstructive Pulmonary Diseases) Cases and control Groups:

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Pulmonary function test is a valuable investigating procedure in the obstructive and restrictive pulmonary diseases. These tests help to diagnose the qualitative & quantitative loss of pulmonary functions. These tests provide clues for early detection & better management of diseases.

The present study was carried out in the physiology deptt. S.C.B. Medical College, Cuttack, Orissa during the year 1998-1999. The study comprised of 20 healthy male & 20 patients suffering from COPD in the age group of 60 to 80 years. Six different lung parameters FVC, FEV₁, MEF₂₅, MMEFR, MVV, & PEFR were studied. The lung volumes, capacities and flow rates were recorded by computerized med.-Spirometer. Observations were made by comparing the results of study group and control group.

All the ventilatory parameters are decreased in study group in comparison to their control value.
RES - 09  APROTININ REVERSES THE CARDIOPULMONARY TOXICITY PRODUCED BY MESOBUTHUS TAMULUS VENEM IN ADULT RATS

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The present study was conducted to examine the protective role of aprotinin (kallikrein-kinin synthesis inhibitor) against Indian red scorpion, Mesobuthus tamulus (BT) envenomation. Blood pressure, electrocardiogram (ECG) and respiratory movements were recorded in the anaesthetised rats. At the end of experiment, lung compliance was determined by introducing a known volume of air in the lungs through a tracheal annula. BT venom 5 mg/kg produced instantaneous apnea followed by shallow irregular breathing with intermittent gasping. An immediate fall followed by a rise and then a progressive fall in mean arterial pressure was observed. BT venom produced changes in heart rate and ECG wave pattern. Lung compliance was 0.15 ml/mm Hg and was lesser than the compliance in saline treated animals. The animals died within 60 minutes after BT venom. Aprotinin pretreatment reversed the toxic manifestations induced by BT venom within 30 min and the animals survived throughout the period of observation. The lung compliance in aprotinin + venom treated rats was 0.21 ml/mm Hg and was similar to saline treated group. The results indicate that aprotinin plays a protective role in preventing the cardiopulmonary toxicity induced by Mesobuthus tamulus venom.

RES - 10  STUDY OF PULMONARY FUNCTION TESTS IN COTTON INDUSTRY WORKERS

S.D. Gundre, S.M. Hundergulle, M.S. Patwardhan, A.K.S.B. Mane
S.R.T. Medical College, Ambajogai - 431517. Dist : Beed, Maharashtra

The present study was conducted in two cotton spinning mills of Solapur. 100 cases and 100 controls were divided in four age groups. Pulmonary function tests were carried out on a computerised medspirer. The parameters were compared with age matched controls. There was significant decline in FVC, FEV_{1}, PEER and MVV in all age groups, which is suggestive of restrictive as well as obstructive changes. Also the cases were compared amongst themselves depending upon duration of exposure. The significant decline in FVC, FEV_{1} and MVV is suggestive of paranchymatous lesions as well as obstructive changes with long term exposure to cotton fibres.

RES - 11  A STUDY OF PULMONARY FUNCTION WITH CAPNOGRAM IN SMOKERS AND NON-SMOKERS

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Capnography is measurement of CO_{2} tension in the expired alveolar gas and reported to be a good reflector of the status of circulation and found to be useful in clinical evaluation of patients with difficult airway, patients with susceptibility to malignant hypothermia, assessment of efficacy of cardiopulmonary resuscitation (Pai et al 1999). Chronic smoking is a factor, which not only causes chronic airways obstruction but also affect many system of the body & responsible for 90% of chronic pulmonary diseases. Measurement of expiratory flow in chronic smokers demonstrated inconsistent observation irrespective of changes in small airways of smokers. Pulmonary function test in chronic smokers have been reported normal inspite of significant changes in morphology of respiratory system in the early years of beginning of
smoking. ETCO₂ has been reported to be decreased with reduced oxygen saturation (Sausen 2001). However the data on ETCO₂, IMCO₂, and AWRR in health & disease are very scanty.

Present study has been undertaken in normal & chronic smokers to assess their pulmonary function and their comparison with capnogram. The subjects and controls were drawn from the Surat Municipal Institute of Medical Education & Research, Surat. The subjects were clinically examined by the investigators for any other ailments except chronic pulmonary diseases and were excluded. The PFT of all the subjects were carried out by computerized "Medspiro". The pulmonary function test (PFT) of the 112 subjects comprises of 56 smokers with H/o chronic smoking for more than 5 years and 56 normal healthy individual as controls. ETCO₂, IMCO₂, and AWRR were also measured by computerized "Hewlett Packard Agilent ETCO₂ Module" in all the subjects prior to spirometry.

Results of the study were analysed statistically using "SPSS" software and it is found that there is significant correlation (r = 34) between PFT & Capnogram.

RES - 12 RELATIONSHIP OF EXHAUSTION TIME AND WORKDONE ON OXYGEN DEBT DURING SUPRAMAXIMAL EXERCISE

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# DSACS, New Delhi, * Deptt of Physiology, GSVM College, Kanpur

It has been postulated that oxygen debt incurred may be related to the utilization of some energy source during exercise. The magnitude of the oxygen debt would then be expected to be closely related to the total work performed. This relationship has however not been adequately studied. The present study was undertaken to determine the relationship of work done and exhaustion time on the magnitude of oxygen debt incurred during supramaximal exercise.

Ten untrained, healthy, male subjects performed acute intense exercise on a friction type bicycle ergometer. Pre-exercise oxygen consumption and the time to exhaustion were recorded. The total post exercise oxygen consumption was spirometrically recorded until it fell down to the pre exercise oxygen consumption and oxygen debt incurred was calculated. Work done was also calculated. Pre exercise oxygen consumption was found to be 279±49.09 ml/min; exhaustion time during supramaximal exercise averaged 8.70±2.87 min; and the work output on supramaximal exercise averaged 69.40±15.31 watts. Oxygen debt of 7.77 ± 0.96 L was incurred in the exercising subjects.

On statistical analysis the work done had a highly significant (p<0.001) relationship with the oxygen debt incurred. (Coefficient of correlation r=0.98). On the other hand exhaustion time could not be significantly (p>0.05) correlated with oxygen debt (coefficient of correlation r= -0.32). It was concluded that oxygen debt increases linearly with the work done during supramaximal exercise. The present study however could not establish such relationship between exhaustion time and oxygen debt incurred.

RES - 13 A COMPERATIVE STUDY OF PULMONARY FUNCTIONS IN COMPETITIVE SWIMMERS & HEALTHY BOYS

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GIT-01 Effect of α-Lipoic Acid (LA) on Carbon Tetrachloride & Paracetamol induced Hepatotoxicity in Rats

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The natural cofactor α-LA as well as its reduced form dihydrolipoic acid (D1HLA) exhibit antiox-
dant, free radical scavenger & cytoprotective properties. In the present study α-LA was tested for its hepatoprotective activity in CCL 4 & PCM induced hepatotoxicity.

Male albino rats (180-200g) of either sex with free access to standard diet and tap water were used. Animals were divided into 6 groups of 7 each. GP-I Control (olive oil 2ml/Kg/ip), GP-II-mixt. of CCL 4 + olive oil (1:1) 2 ml/kg., ip) 3 inj. At 1, 4 & 7d), GP III-α-LA (100mg/Kg, po) 5 days prior & continued for 10 consecutive days + CCL4, GP-IV Control (0.2% gum tragacanth Susp. po.) GP-V-Paracetamol (2g/Kg, po) Single dose. GP-VI-α-LA (100mg/kg, po) 5 days prior to PCM & continued for 5 days. After 48 Hrs., of CCL4 and PCM bloor was withdrawn for aspartate aminotransferase (AST), alanine aminotransferase (ALT), gamma glutamyl traspeptidase (r-GT) & Serum alkaline phosphatase. After gross Examination of liver, biopsy was taken for histopathology.

In CCL 4 & PCM induced hepatotoxicity in rats α-LA significantly (P<0.01) reduced the elevated levels of AST, ALT, r-GT and serum alkaline phosphatase. CCL 4 & PCM induced liver necrosis was also found to be reduced as observed macros copically & histologically.

**GIT-02**
Enhancement of Iron Polymaltose Complex Absorption by Concomitant Administration of Vitamin C in Human Volunteers.

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**Physiology, Govt Medical College, Chandigarh**

Iron polymaltose complex (IPC) is a recently marketed preparation with questionable bioavailability, since iron from IPC is in ferric form, the adequacy of its absorption profile has been doubted. We hypothesized that concomitant administration of Vitamin C would lead to increase in the absorption of iron from IPC. The study was conducted in eight healthy, non-smoking, non-alcoholic volunteers after obtaining their written informed consent and after Institutional Ethical Committee approval. The study was conducted in two phases; volunteers received 100mg IPC or 100mg IPC with 500mg Vitamin C in a randomized, two-way, complete cross-over design. After a wash-out period of 1 week all the volunteers were crossed over. The blood samples were collected, iron levels estimated and the pharmacokinetic parameters calculated. Iron levels were significantly higher at all time points when IPC was given with Vit-C as compared to IPC alone; there was about 20% increase in Cmax (195.4 ± 34.5 mg/dl vs 165.1 ± 31.7mg/dl ; p<0.05); Tmax was not altered, there was significant increase in the AUC0-6 (45.26 ± 11.38µg/ml.h vs 1014.48 ± 84.39µg/ml.h; p<0.05) and AUC0-∞ (1642.15 ± 93.32 vs 1156.32 ± 86.32). In conclusion, the absorption of iron from IPC can be significantly enhanced if it is combined with Vit-C.

**GIT-03**
A SINGLE BLIND STUDY OF THE EFFECT OF CURCUMIN ON CHRONIC PANCREATITIS

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* Department of Pharmacology, ** Dept. of Gastroenterology,
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**Objectives:** To evaluate the efficacy of curcumin in chronic pancreatitis.

**Materials & methods:** Fifteen patients of chronic pancreatitis were enrolled for a period of 6 weeks
for the study. Eight patients received capsules of curcumin 500mg+ piperine 5 mg. The other seven were given placebo for the same period. Blood MDA and GSH levels were estimated before the study and at the end the study. Pain was analyzed using visual analogue scale.

**Results:** The results were analyzed using two-tailed paired 't' test. There was a significant decrease in the MDA levels, and increase in the GSH levels, in the group treated by curcumin when compared to placebo group treated by curcumin when compared to placebo group. There was no significant improvement in pain in both the groups.

**Conclusions:** Curcumin decreases the oxidative stress as indicated by decrease in the MDA levels & increase in the GSH levels, and improves antioxidant defense in these patients. There was no improvement in pain, and the overall clinical well being of these patients did not improve much. Probably there is a need to increase the dose and duration of treatment to show any clinical improvement in these patients; hence further studies are required in this regard.

**GIT-04** Effect of Fenugreek Extract on Hyperlipidemic subjects - A preliminary study.

SANJEEVA, NARENDRANATH, VASANTH KUMAR, RAO NAMITHA, *SHASTRY AK

DepartmentS: Pharmacology, *Medicine

Kasturba Medical College, Manipal, Karnataka

**Objectives:** To evaluate the efficacy of fenugreek capsules in hyperlipidemic subjects.

**Materials & Methods:** 10 subjects were enrolled for 8 weeks, after obtaining ethical committee clearance and their consent. Subjects in age group of 35-65 year were selected from medicine outpatient with following criteria - total cholesterol > 220 mg/dl, serum triglyceride > 140 mg/dl. Fenugreek capsules were procured from Brihans Pharmaceuticals, Thana. Each subject received 500mg three times daily. After overnight fasting, blood was collected for estimation of lipid profiles before and at the end of 8 weeks.

**Results:** The data was analyzed by students paired 't' test. The baseline values were; Total cholesterol - 262.79 ± 9.57, LDL - 146.31 ± 12.39, serum Triglyceride - 344.11 ± 75.38, HDL - 47.67 ± 4.07. After 8 week the values were; Total cholesterol - 228.56 ± 9.57, LDL - 137.96 ± 14.28, serum Triglyceride - 230.44 ± 45.04, HDL - 47.56 ± 3.74.

**Conclusion:** There was 13% decrease in total cholesterol level, 5% decrease in LDL level, serum triglyceride level was reduced by 33%. There was no change in HDL level. Thus there was significant reduction of serum triglyceride level. HDL/Total cholesterol ratio were 5.77 ± 0.57, 4.99 ± 0.4 before and after the treatment respectively (p < 0.01). Further comparative studies are going on to strengthen the results obtained in this preliminary study.

**H-01** A Comparative study of Blood Groups amongst the population of different states of North-East.

Dr. (Mrs.) Bonti Bora, Dr. B.P. Das

The study has been carried out on the medical, dental and para-medical students from different states of North-east studying in Gauhati Medical College. 50 (fifty) students from each state was selected and their blood-groups were determined. As there is prevalence of malignacies in the North-east region, particularly Assam and Meghalaya, this study has been carried out to find any co-relations between blood-groups and occurrence of malignency.
H-02 Correlation between theophylline clearance erythrocyte sedimentation rate and serum albumin in asthma

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Objective: To observe the correlation between theophylline clearance erythrocyte sedimentation rate and serum albumin in asthma patients.

Method: Twenty asthma patients (12 males; 8 females; age 28±9 years; weight 50±10 kg) were selected from medical out patient department of hospital. Blood hemoglobin, total leukocyte count, serum albumin and erythrocyte sedimentation rate (ESR) were measured for all patients. All patients were treated with theophylline tablet 300mg orally after 14 hours overnight fasting. Blood samples were collected after 2,4,6,8 and 10 hours of drug administration. Serum theophylline concentration was estimated by EMIT based Theophylline assay kit (Syva, San Jose) using Microanalyser (PCS Italy). Theophylline clearance was determined from half-life and volume of distribution obtained from log concentration time curve.

Results: Average values of serum albumin (4.6±0.7gm/dl) ESR (32±15 mm/hr) and clearance (103±22 ml/hr/kg) were observed. There was significant negative correlation (r = -0.62; p<0.01) between theophylline clearance and ESR. There was significant negative correlation (r = - 0.74; P < 0.01) between serum albumin and ESR. There was insignificant positive correlation (r = 0.39 ; P > 0.05) between theophylline clearance and serum albumin.

Conclusion: Asthma patients with high ESR and lower serum albumin may have lower theophylline elimination.

H-03 Study of Correlation between parity, age and the haemoglobin level of pregnant women of Sikkim with the birth weight of their new born babies.

Dr. L. Deben Singh, Dr. S. Agrawal, Dr. S.K. Saxena

Sikkim is a hilly station having about 5000ft height above the sea level which gives rise to mild polycythemia. During normal course of pregnancy, there is also mild polycythemia. The combination of these two effects might have some correlations with the birth weight of New Born babies. In our study, we tried to correlate with parity, age and Hb level of mothers and birth weight of their new born babies.

We have examined 30 nos. of primi and 30 nos. of multiparous women in the age group of 16-36 years of age. In 42 nos of pregnant women, the haemoglobin level were less than 12G% and 12 no. of pregnant women, haemoglobin level were more than 12G%. The mean birth weight (in kgs) delivered by Primi was 2.93 and the mean birth weight delivered by Multi was 3.01 being the mean difference of 0.08. The mean birth weight delivered by younger age group (<25 years) were 2.90 whereas it was 3.03 for higher age group (>25 years). The birth weight of babies delivered by women having less than 12G% of Hb were 2.90 but it is increased to 4.20 in case of women having more than 12G% Hb level.

In our studies, the birth weight is significantly correlated with these pregnant women having multiparous, having more than one child and older age group of pregnant women and having more than 25 years of age and having more than 12G% of Hb.

The reason for increase in birth weight of New born babies by multiparous might be related with the previous exposure to erythropoetin due to previous pregnancy. It is also clearly seen that these women having more than 12G% of Hb gives better weight child.
H-04  KINETICS OF TWO DIFFERENT IRON FORMULATIONS AND THEIR EFFECT ON DIURNAL VARIATION OF SERUM IRON LEVELS

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Iron polymaltose complex (IPC) is a recently marketed preparation with questionable bioavailability. We compared the absorption kinetics of IPC with ferrous sulfate. We also studied the effect of oral iron on diurnal variation. The study was conducted in eight healthy, non-smoking, non-alcoholic volunteers after obtaining their written informed consent and after Institutional Ethical Committee approval. The study was conducted in three phases: during the first phase no drugs were given whereas in the second and third phases, ferrous sulfate (66 mg elemental iron) and IPC (100mg) were given in a randomized, two-way, cross-over design, with a wash-out period of 1 week. The blood samples were collected, iron levels estimated and the pharmacokinetic parameters calculated. Circadian rhythm in iron levels was demonstrated by cosinor analysis with a mesor of 93.6 µg/dl, acrophase 10.40 h and amplitude of 26.4 µg/dl. Evening levels were higher as compared to morning levels. Drug treatment increased the mesor (115.7 µg/dl; P>0.05) delayed the acrophase (11.30 h; p < 0.05) and increased the amplitude (38.5 µg/dl; p < 0.05). The bioavailability of ferrous sulfate was significantly greater as compared to IPC with greater Cmax and AUC (p<0.05). In conclusion a clear cut circadian rhythm in iron concentrations was demonstrated. Ferrous sulfate has significantly higher bioavailability as compared to IPC.

H-05  A STUDY OF RACIAL VARIATION OF BLOOD GROUP

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According to recent studies it has been seen that there are racial and ethnic differences in blood type. All human population share the same blood system although they differ in the frequencies of specific type.

Group 'O' has been found to common among red Indian tribes of America, section of Australian and Africans. North West European and West Indian have a high frequency of Group A. Where as Group B in more common in Central South East Asia. Among Indians, Group B is highest in the North East and lesser in South India (Chaterjee CC. Human Physiology, Page 182-83).

Among the people of the Shompen tribe of Andaman and Nicobar Island and Red Indians of Peru are 100% 'O' Group. The other blood group are totally absent.

In the present study, an attempt was made to differentiate the different blood group of the first year medical students having different races and ethnic group. The result obtained in this study reveals that maximum percentage in the tribal and in the general medical students have 'O' blood group. And in the students of Ahom Community the incidence of blood group 'B' is more.

H-06  Effect of acute exhaustive swimming exercise on immune function in trained and untrained Wister rats.

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Deptt of Physiology. B.J.M.C., Pune, Maharashtra

The study consisted of three groups of female Wistar rats as follows:

- 'A' group : trained in swimming exercise for six weeks
- 'B' group : the untrained sedentary group
• 'C' group: the control group.

At the end of six weeks period, A and B groups were subjected to exhaustive swimming. Two hours after the termination of the exhaustive exercise bout, the immune competence was evaluated in all the three groups by determining:

- Absolute lymphocyte count
- Haemagglutination titre to sheep cell antigen and
- Delayed hypersensitive reaction to oxazalone.

In order to assess non specific and specific B and T cell immune functions respectively. The results were subjected to statistical analysis by Kruskal Wallis and Mann Whitney tests. Accordingly, the above immune parameters were found decreased significantly in:

- the trained A group and the untrained B group when compared to the control group.
- the untrained B group as compared to the trained A group.

The results suggest that acute exhaustive exercise causes immune suppression; however, this may be minimized by regular exercise training.

ROLE OF YOGA-ASANS OF BIOCHEMICAL PARAMETERS IN HYPERTENSIVE AND CAD PATIENTS

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The beneficial effect of yoga-asans in health and various diseases particularly in conditions having the element of stress (e.g. cardiovascular, endocrinal etc.) is being well recognized in western countries. But in Asian countries particularly in India the awareness is much less. The present study shows the effect of yogic exercises on lipid profile in hypertensive as well as in patients of CAD (coronary artery disease).

Subjects having hypertension and CAD having clinically and laboratory diagnosed and treatment, were called to cardio-respiratory lab. in the morning, from GTB Hospital medical OPD. The duration of disease ranged from 1-10 yrs. Patients having more complications (Cardiac, renal, retinal and cerebral) were not included. Yoga-asanas training was given for 20-30 mts. in the lab. by the trained expert, everyday for 40 days. It was made sure that the subjects were comfortable and did the stretch exercise without any exertion. Their basal biochemical, anthropometric, cardiac and lung parameters were recorded and repeated after 40 days.

The results showed a fall in blood glucose, total cholesterol, LDL, VLDL and Triglyceride level, which was statistically higher significant. The value of HDL increased in hypertensive significantly. This beneficial effect of yoga-asans were seen not only in biochemical but also on cardiac and pulmonary parameters. Slide showing the detailed results will be further shown in the conference.

COMPARATIVE EVALUATION OF IMPACT OF VARIOUS RELAXATION TECHNIQUES ON AUTONOMIC FUNCTIONS IN FIRST YEAR MBBS STUDENTS.


Department of Physiology, Government Medical College, Chandigarh.

** Brahmkumari Institute, Chandigarh
*** Yoga Institute, Chandigarh

Earlier studies conducted by Department of Physiology, GMCH, Chandigarh on medical students during the various phases of medical curriculum in the first year MBBS course evaluated through physi-
logical and psychological variables revealed significant stress in them. Various relaxation training programmes were conducted for students by the Department so as to reduce education related stress. Students were divided into groups of 15 students each. One group was administered Rajyoga way of meditation practice (stress management course) at Brahmakumari Institute, Chandigarh for a duration of 20 days, other group underwent Yoga technique of relaxation at Yoga Institute in Chandigarh for a duration of six weeks and one group was kept as control. Cardiovascular autonomic parameters (sympathetic and parasympathetic) were evaluated before and after the relaxation in both the groups. Significant improvement was found in parasympathetic parameters that is 30:15 ratio, E:I ratio with deep breathing and valsalva ratio after relaxation training programme in the students who did Rajyoga meditation practice. The students who underwent yoga training did not reveal any significant change in 30 : 15 ratio, E : I and valsalva ratio after the training. The improvement in parasympathetic cardiovascular parameters is beneficial to human body as it reflects better reflex vagal activity. Hence our study suggests that Rajyoga meditation is able to provide better relaxation.

Y - 03  OF HERBS AND NAMES: A STUDY OF HERBAL MEDICINES IN THE INDIAN MARKET
V. Roy, A. Bhatia
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Standardization of herbal remedies can be difficult because herbs contain complex mixtures of many chemicals and because the constituents responsible for the claimed effects are often unknown. Since herbal remedies are exempt from rigorous regulations there may be considerable variation in the composition of a herbal remedy, as well as discrepancies between label information and actual content. Common use of vernacular names for the constituents of herbal remedies on the drug product, as well as the fact that there may be more than one vernacular name or even more than one scientific name may increase the problem associated with identification and appropriate use of the herbal product.

Y - 04 Nature-Cure/Naturopathy- A Basic Medical Science
Dr. Sanjeev Kr. Pandey, Director
Sankalp Health Education & Research Institute (SHERI), Lko

Nature Cure / Naturopathy is a constructive drugless method of treatment & keeping the individuals health in normal state, which aim to removing the basic cause of disease through the rational use of the elements freely available in the nature, rather, it is not only a system healing but also a way of life, in tune with internal vital force or natural elements composing the human body. A simply a complete revolution in the Art & Science of healthy living.

The fundamental difference of Nature Cure with other system is that its theory and practice are bases on holistic viewpoint where as the later's approach is specific. Nature Cure does not believe in the specific cause of disease and its specific treatment bit takes into account the totality of factors responsible for disease such as unnatural life style, -ve thinking & also consider the environmental factors involved which on whole disturbe the normal functioning of the body & leads it to stress condition. For tratment, it primarily stresses to correct all the factors involved and allows the body to recover itself. The Nature Cure physian helps in Nature's efforts to overcome disease by applying natural modalities and controlling the natural force to work within safe limits.

Y - 05 Effect of yoga practice in reducing premenstrual stress in the healthy women.
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Premenstrual stress is a major clinical entity afflicting a large segment of the female population in
It is characterized by a constellation of physical, psychological and behavioral symptoms during premenstrual phase with complete absence in postmenstrual phase. The present study aims to evaluate the effectiveness of yoga practices, if any, in reducing premenstrual stress. Fifty young women between age group 18 to 22 years volunteered for the study. Their base line recording for following parameters were taken both during post menstrual and premenstrual phase of a menstrual cycle (initial menstural cycle) :- Body weight, sensory-motor functions (Auditory and visual reaction time), autonomic status (Resting HR, SBP, DBP, sympathetic reactivity test and parasympathetic reactivity tests) and psychological scores (Anxiety, depression, anger and sense of well being). Following the base line recordings, they were randomly divided into two groups having 25 subjects in each group. Group I practiced yogic exercises for a period of three menstrual cycles and group II served as control. The follow up recordings were taken both in post menstrual and premenstrual phases of second and third menstrual cycles in both the groups.

Yoga group depicted a significant decrease in premenstrual body weight, auditory and visual reaction time, resting HR, SBP, DBP & sympathetic reactivity with no change in parasympathetic reactivity, and improvement in psychological parameters in the second menstrual cycle. The changes persisted even in the third cycle. No such changes were found in the control group. The results indicated effectiveness of regular practice of yoga in reducing premenstrual stress.

YOGIC LIFE STYLE, SLEEP PATTERN AND HEALTH STATE IN UNIVERSITY STUDENTS

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It has been suggested that sleep quality and health state improve with adopting positive and Yogic life style comprising regular practice of Yoga and Preksha Meditation in elderly people. Life style may be one of the factors largely responsible for compromising the health of young people too. This study was aimed at examining the sleep quality and health state of in-house resident students of JVBI Deemed University, Ladnun. A total of 46 male students (aged 22-28 years) living in student’s hostel were incorporated in this study. Interventions by light health rejuvenating exercises, few selected asanas, and Preksha Meditation for 40 minutes were carried out in the morning for 4 weeks. The subjects physical activities were recorded using actigraphs for one week before and post-intervention. A questionnaire based on life style and sleep - health was also got filled before and post-intervention period. Actigraph data and questionnaire results were analysed to determine "Sleep" and "Wake" periods by applying a Cole’s validated algorithm to the portions of records indentified as sleep periods by the combination of sleep logs. Mental health was assessed in terms of General Health Score by using the distributed questionnaire mainly enquiring about subjects volition and physical health. The results demonstrate that life style was effective in bringing qualitative improvement in sleep quality, mental health and volition, along with their physical health. After intervention their academic performance was also improved. It also verified the reliability of the sleep-health risk index and the questionnaire.

EFFECT OF YOGA ON BLOOD PRESSURE RESPONSES IN STIMULUS INDUCED CONDITIONS IN HYPERTENSIVE PATIENTS

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Background and Objective : Yoga is useful in controlling blood pressure in hypertensives thus it
35.27% with medical rectus and 12.21% to 28.69% with lateral rectus muscle. The reflex fall in blood pressure was not affected by bilateral vagotomy. Thus oculodepressor reflex showed a graded response to progressive increasing stimulus strength.

CNS - 06 Relation Between Sympathetic Autonomic Dysfunction And Median Nerve Involvement In Patients Of NIDDM With Neuropathy.

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Autonomic and somatic (sensory as well as motor) nerve dysfunctions are progressive forms of diabetic neuropathies. Few studies have, however, compared the progression of autonomic dysfunction with somatic nerve dysfunction in diabetic patients. This study was undertaken to investigate the relationship between sympathetic autonomic dysfunction and somatic neurological involvement in patients of NIDDM with neuropathy.

20 patients of NIDDM with neuropathy were divided into 2 groups using isometric handgrip exercise test (as indicator of sympathetic autonomic dysfunction). 9 patients with borderline dysfunction having diastolic BP increase, between 11-15 mmHg (group I) and 11 patients with abnormal autonomic function having diastolic BP increase of <10 mmHg (Group II). The two groups were comparable with regards to age, sex, duration of diabetes and type of diabetic neuropathy (painful) or glycaemic control.

Median nerve conduction study (NCS) for both sensory and motor involvement were then performed on all patients. Amplitudes for motor (MAMPW, MAMPE) as well as sensory components (SAMP) were found to be significantly decreased in group II when compared to group I (p < 0.001). The distal latencies of the motor nerve (MDL) were also significantly raised (p<0.05) in the patients with abnormal autonomic function when compared to patients with borderline dysfunction. However, no significant difference was observed in distal latencies of the sensory NCS (SDL) or the velocities (both motor (MV) and sensory (SV)) between the two groups.

The data indicates that in cases of NIDDM, deterioration of sympathetic autonomic dysfunction is associated with increase in median nerve dysfunction and that the amplitudes of NCS are better indicator of this somatic nerve dysfunction than sensory or motor nerve velocities.

CNS - 07 Incidence Of Autonomic Neuropathy In Type II Diabetes Mellitus.

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Diabetes Mellitus is one of the most important metabolic disease, which afflicts nearly every organ system in the body. The autonomic dysfunctions often remain asymptomatic for a long period but it can be early detected by autonomic function test even before a symptoms of autonomic neuropathy develops. Sensitive and quantitative measure of Autonomic Nervous System function were made in 30 type II diabetic subjects and 25 age and sex matched controls were randomly selected from medical department of K.G's Medical College, Lucknow. Cardiac Autonomic Neuropathy was found in 18 patients (60%), Orthostatic Hypotension in 5 (17%), abnormal Valsalva Ratio in 9 (30%), abnormal Slow Respiration in 10 (30%), abnormal Heart rate response to standing in 8 (27%) and abnormal Blood Pressure response to Hand grip in 6 (20%) ... Incidence of parasympathetic neuropathy 60% in comparison to 20% sympathetic neuropathy was found.
Study Of Effects Of Mental Stress And Relaxation On Various Parameters In Normal Healthy Medical Students.

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- ANITA POWAR CHoudhury.
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Relaxation is known to enhance one's ability to combat the stress induced sympathetic response. The present study was planned to determine the effects of mental stress and relaxation on E.C.G, Blood Pressure, Pulse Rate, Respiratory Rate and E.E.G. in 100 normal healthy medical students. Statistically highly significant effects of mental stress were seen on E.C.G, Blood Pressure, Pulse Rate, Respiratory Rate, and E.E.G. Similarly statistically highly significant effects of mental relaxation were observed on all above parameters.

Key words: Mental stress Mental relaxation E.C.G E.E.G

ELECTRICAL FOOT SHOCK STRESS DURING POST WEANING PERIOD ALTERS THE DENDRITIC ARBORIZATION OF SUBSTANTIA NIGRAL NEURONS IN ALBINO MICE

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Stress is a known cause for a large number of psychosomatic disorders. It has been shown that stress affects the neuronal dendritic morphology of various brain regions, particularly hippocampal and substantia nigral neurons in adult rodents. Aim of the present experiment was to study the effect of electrical foot shock stress during postweaning age on the dendritic morphology of the substantia nigral (SN) neurons in albino mice. Albino mice of 21 days old were subjected to intermittent (at 5 min interval) electrical foot shock stress (60-70 Volts, 50 Hz), 3 hrs/day, in a foot shock apparatus for 5, 21 and 60 days. After the stress, mice were sacrificed along with age matched controls. Substantia nigra was dissected out and processed for Golgi staining. Camera Lucida tracings of the of SN neurons were analyzed for dendritic intersections (dendritic length), and branching points. In mice subjected to 5 days stress there was no change in dendritic intersections and branching points compared to control. In 21 days stress group there was a significant decrease in a) dendritic intersections at 20/-1 & 40/-1 concentric circles b) total number of dendritic branching points c) dendritic branching points at 20-40/-1 & 40-60/-1 concentric zones compared to control mice. In 60 days stress group there was a significant decrease in dendritic intersections at 40/-1, 60/-1 and 80/-1 concentric circles. In the same group of experimental animals there was a significant decrease in total number of dendritic branching points and dendritic branching points at 20-40/-1, 40-60/-1, 60-80/-1 concentric zones. In conclusion prolonged stress, but short duration stress, during post weaning period affects the SN neurons which may lead to behavioral changes in these animals.

STUDY OF LUNAR INFLUENCES IN NEURO-Psychiatric DISORDERS AN EEG BASED STUDY

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The phenomena of the moon and its phase are one having influence on human in health and illness.
is an accepted fact in the sciences of ayurveda, astrology and Religion.

120 individuals were considered where in 40 belonged to each group namely (i) Control group having no neuro psychiatric disorders (ii) Individuals who have disorder and also show lunar phase changes (iii) cases who have no lunar changes.

The patients in neuropsychiatry disorders, who have tendency to be influenced by lunar phase of new moon and full moon have:

1) Mere positive history of major medical or neurological illness.
2) These previous disturbances cause neuronal dysfunctioning as evidenced by EEG record.
3) This dysfunction causes pre-disposition to lunar phase fluctuations.

CNS - 11 GENDER SPECIFICITY OF SUCROSE INDUCED ANALGESIA IN ADULT HEALTHY VOLUNTEERS
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Sweet palatable substances are reported to immediately calm (upto 30 min) infants undergoing routine investigative procedures. Nociceptive response is reported to have a gender bias in human adults. The present study was designed to explore the effects of sucrose ingestion on the nociceptive status of adult volunteers as reflected by the pain threshold and nociceptive flexion reflex (RIII). The male subject (n=12) were randomly divided into control and experimental groups while the female subjects (n=6) served as their own controls. In all the subjects, RIII reflex was recorded, before and after either ingestion of sucrose solution (experimental group) or plain water (control group). Immediately after the intervention RIII reflex response was recorded which was repeated every 5 min. until 20 min. In control male subjects the amplitude of the RIII reflex was 21.49 ± 7.38 μV before water ingestion and 24.11 ± 9.34, 24.8 ± 5.46, 18.58 ± 4.03 and 17.12 ± 4.34 μV at 5, 10, 15 and 20 min respectively. In the female subjects the amplitude was 32.45 ± 8.51 μV before ingestion of water and 40.16 ± 12.33, 52.99 ± 27.26, 45.88 ± 16.55 and 41.93 ± 18.44μV at 5, 10, 15 and 20 mins respectively. In experimental male subjects there was a significant analgesia indicated by an attenuation of the RIII reflex uptill 15 min post sucrose ingestion. Whereas, in the female subjects, the RIII reflex was attenuated only uptill 5 min.

This is the first report of sucrose induced analgesia in adult humans, which is prolonged (0-15 min) in males than in female volunteers (0-5 min). The study suggests the existence of a gender dependent variation in sucrose induced analgesia.

CNS - 12 NEURAL REPAIR BY NERVE GROWTH FACTOR IN HEMIPARKINSONIAR RAT
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Parkinson's disease (PD) is a progressive neurological disorder characterized primarily in significant decrease of dopamine in the striatum. Review of literature indicates that none of the drugs so far studied for preventing the PD was found to be promising for use. Therefore the goal of present study is to find drug which could protect dopaminergic neurons from the degenerative process. In the present study, we investigated whether nerve growth factor injection into the striatum of 6-hydroxydopamine-induced hemiparkinsonian rats would result in a sustained functional recovery. The animals were injected unilateral with 8μg 6-OHDA into lateral striatum. The coordinates were chosen with reference to bregma : Anterior = 0mm, lateral 3.5mm, ventral to the dura 5.5mm, with the tooth bar set 3.3mm below the interaural line, according to the Paxinos and Watson atlas. The apomorphine-induced rotational behavior, stepping
test, initiation time, postural balance, disengage behavior and histological evauation revealed significant behavioral recovery in animals. Intrastriatal administration of nerve growth factor injection significantly changed apomorphine induced rotations from $258 \pm 25$ to $155 \pm 12$, staircase test from $80\%$ to $90\%$, stepping test from $6 \pm 1$ steps to $10 \pm 2$ steps, initiation time from $16 \pm 4$ s to $12 \pm 2$ s, postural balance test score $4 \pm 1$ to $10 \pm 2$ and disengage behaviour $120 \pm 21$ s to $60 \pm 8$s. Brain sections also demonstrate that administration of nerve growth factor reduced dopaminergic neurons damage mediated by 6-OHDA. These findings support a facilitator role for nerve growth factor in rat model of Parkinson's disease.

Key words: nerve growth factor, Parkinson's disease.

CNS - 13 EEG AND EPILEPSY
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Dr. (Mrs.) Sudipa Choudhury, Head of the Deptt.
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A study case carried out to observe changes during EEG with clinical history of Epilepsy. In all the individuals reactivity to eye opening and response to hyperventilation were present during awake state. Abnormalities like spikes and spike waves during sleep were present in patients with complex partial seizure, which were statistically significant compared with the other two groups (Generalized and partial). The subject with history of Nocturnal seizure with abnormal EEG changes during sleep were statistically than the other two groups.

CNS - 14 COGNITIVE PERFORMANCE AND EVENT RELATED BRAIN POTENTIALS AT HIGH ALTITUDE.
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High Altitude exposures have been found to diminish cognitive performance. It is the hypoxia at HA that becomes a limiting factor for physical and mental performance Substantial impairments, in a number of cognitive performances, in psychomotor performance, mental skill, reaction time vigilance, memory and logical reasoning have been observed altitude above 3000m.

Event related potentials (ERPs) are "small phasic potential elicited in conjunctions with sensory, cognitive and motor events" that can be detected by recording from scalp electrodes.

We have studied the effects of hypobaric hypoxia on cognitive processing on volunteers by recording event related potentials (ERPs) using standard auditory odd ball paradigm. The subjects were studied at sea level (SL) and then inducted to high altitude (HA) of 3200m (HA I) and 4300m (HA II) in eastern Himalayas and on return to sea level (RSL). The P2 latency and N1 latency were unaffected at HA I and HA II as compared to SL indicating no effect on sensory conduction at HA I and HA II. While at 4300m, most of the subjects showed an increase in latency of N2-P3 components reflecting sensory discrimination and evaluation process at 4300m. At 3200m, only 10 out of 20 subjects showed an increase in P3 wave latency and 3 subjects did not show any change in N2-P3 components. From these results, it may be concluded that P 300 wave latency increases with increasing altitude. N2 wave latency increases at HA II (4300m) was more than at HA I (3500m). The observations indicate that hypoxia causes showing of the perprocessing stage of stimulus evaluation at 4300m.

EN - 01 THE EFFECT OF SEMINAL LEUCOCYTE (LEUKOCYTOSPERMIA) ON SEMEN PARAMETERS AND SPERM FUNCTION TESTS
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As per Spencer et al more than 35 percent cases of infertility are because of male factors. The
important male factors contributing to male infertility include morphological and functional abnormalities of spermatoza. The leucocyte induced injury to the sperm structure and function secondary to the production of free radicals by the leucocytes is one of the important determinants of fertilizing potential of the spermatozoa. In this study, the subjects with the complaint of infertility were classified into three study groups according to their leucocyte count. Group 1 included subjects with seminal leucocyte count \( <10^5 \) wbc/ml, group 2 between \( 10^5 \) and \( 10^6 \) wbc/ml and group 3 > \( 10^6 \) wbc/ml. Their morphological, functional parameters and sperm function tests (hydro-osmotic swelling test, acrosome intactness test, nuclear chromatin decondensation test and sperm mitochondrial activity index) were compared and analyzed statistically. The results revealed that the morphological, functional parameters and the sperm function tests showed a declining trend from group 1 to group 3. Finally we concluded that the seminal leucocyte content is one of the important determinant of sperm fertilization potential and high leucocyte content in the semen sample may be one of the important cause of male infertility.

Key Words: Semen leucocytes sperm function tests

**EN - 02**  
SUB CLINICAL HYPOTHYROIDISM IN ELDERLY: CORRELATION WITH LABORATORY FINDINGS AND OBSERVATION OVER TWO YEARS PERIOD


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Sub clinical Hypothyroidism, because of paucity of positive Laboratory findings poses a great laboratory challenge. It is a very common clinical entity unless detected early leads to inappropriate treatment and multi organ system damage.

Age related physical Decline (ARPD) and depression in the elderlies do mimic sub clinical or mild Hypothyroidism unless meticulously observed, diagnosed and asked for minimum Laboratory Examination such as FT3, FT4, and TSH. Anto-thyroid Antibodies, Cholesterol Examination and Cytological Examination etc.

A multidisciplinary panel report (Published in JAMA 1996) and the Whickham study reported an incidence of 9.3% in elderly women and 1.3% in elderly men and opined that the cost effectiveness of screening for Hypothyroidism in elderlies was comparable to the screening strategies for Hypertension, Diabetes Mellitus and Breast Cancer.

Keeping theses facts in mind the present study was undertaken at S.C.B. Medical College Hospital, Cuttack. 63 elderlies (39 F & 24 M) with a mean of 64.7 years were subjected to TSH estimation and others in selected cases.

Six females and two males were picked up to have Hypothyroidism and 5 of them Depression. The data have been tabulated and compared in the light of those of other workers in India and Abroad.

Key Words: HYPOTHYROIDISM ELDERLY.

**EN - 03**  
EFFECT OF RECOMBINANT BOVINE SOMSTOTROPIN (BOOSTIN-250) ON MILK YIELD AND SOMATOTROPIN LEVEL IN SERUM AND MILK OF LACTATING BUFFALOES

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Now, India is the leading milk producer of world and the contribution of buffaloes are more than 50% of total milk production. With the ever-growing human population the demand for food is increasing
while there is no such increase in livestock productivity. Efforts are recorded to increase the milk production at reduced costs to ensure greater nutritional security, as Indians are traditionally milk consumers. Somatotropin is considered to be the most important hormone for regulation and maintenance of lactation. The genetically engineered bovine somatotropin, produced by recombinant DNA technology is biochemically similar to pituitary derived somatotropin. The use of recombinant bovine somatotropin (rbST) to increase milk yield is accepted in 50 countries including the most developed country like US. However, so far its not in use in India. So in order to investigate the effect of rbST on milk yield and somatotropin level in serum and milk of lactating buffaloes, 30 buffaloes after acclimatization for 30 days were divided into 2 groups as control (n = 10) and experimental (n = 20). Animals were injected 250 mg of rbST (Boostin 250) on 0, 14th and 28th day subcutaneously at ischioretal fosse. Where as control animals were given placebo of 2ml normal saline. fortnightly blood samples were collected from 15 days before injection to 60 days post injection. Sera were separated to estimate the somatotropin level. Somatotropin in serum and milk was estimated by a double antibody indirect sandwich ELISA. From the observations it was evident that the mean serum somatotropin level in rbST treated group was significantly (P<0.001) higher compared to the control. Where as there was no significant change in somatotropin level in milk due to rbST treatment. There was maximum 2 folds increase in serum somatotropin after third rbST injection., which supported the previous funding of 2-10 folds increase. To find the effect of rbST on milk yield, daily milk yield was recorded and weekly average yield of each animal was calculated. The mean of weekly average milk yield in two groups showed a significant (P<0.001) increase in an average of 25% (8-39%) in rbST treated group over control group. This significant increase in milk yield persisted up to one week after the third injection and then reduced to become comparable with the control group average.

From this study it is indicated that increase in milk production by rbST is beneficial and can be used as a lactation enhancer to ensure nutritional security.

Key words :- Somatotropin, rbST, Milk yield, Serum, Milk, Buffaloes

EN - 04 EFFECTS OF FETAL SEX AND NUMBER OF OLDER CHILD ON THE MATERNAL PLASMA TESTOSTERONE CONCENTRATION

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In human pregnancy, the testosterone level in the maternal blood is associated with the sex of the fetus. Current research on homosexual orientation all over the world suggests that homosexuals have older brothers and are exposed to more prenatal androgens than eldest sons. We measured maternal plasma concentration of testosterone on the 8th week of gestation of 30 pregnant women (pregnant women carrying with male fetus 14 and female fetus 16) by ELISA method. Sex of the fetus was determined after the delivery.

Results: The mean plasma testosterone concentration of all pregnant women was 2.31 ± 0.84 ng/ml. The computed (F-ratio), the mean of the 2 types of pregnant women (one type carrying male fetus the other carrying female) differ significantly (p<0.05). The means of the plasma testosterone concentration among the non-homogenous pregnant women in the control group (pregnant women who had neither elder sons or daughters), group A (pregnant women who had only one elder son no elder daughter), group B (preg-
perform by the athlete. With this study an attempt is made to determine whether the long term physical stress develop any adaptive mechanism in the athletes heart and to compare the results with the normal subject. The cardiovascular changes were studied in athletes performing isotonic exercise (n = 30) and they were compared with the normal subjects (n = 30) of same age group. They were evaluated for structural and functional changes by analysing their ECG and ECHO. Increased PR interval, QRS complex duration and resting bradycardia were highly significant important features in ECG of athletes involving isotonic exercise whereas increased QRS complex duration and left ventricular hypertrophy by voltage criteria were highly significant in athletes involving isometric exercise. In ECHO study highly significant increase in left ventricular diameter during diastole, end diastolic volume, stroke volume and ejection fraction was reported in isotonic group of athletes whereas posterior wall thickness, intraventricular thickness, left ventricular mass was highly significant in isometric group of athletes.

The present study concluded that the adaptive changes taking place in the athlete’s heart are responsible for increasing the cardiovascular efficiency and works with the economy of energy expenditure during exercise and rest.

Key words: Exercise Left ventricular mass Athletes

PS - 04 METHODS FOR ESTROGEN RECEPTOR ALPHA ESTIMATION IN BREAST CARCINOMA

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A large number of methods are employed for the qualitative and quantitative estimations of estrogen receptor \( \alpha \) in breast carcinoma. ER \( \alpha \) being an important predictive marker for clinical response to endocrine therapy. Some of the important methods are biochemical radioreceptor assay (DCC method), cytochemical, immunochemical, immunohistochemical method and assay based on receptor gene construct. Biochemical and immunohistochemical (IHC) methods being the most extensively applied receptor assay techniques. Both have specific qualities and produce original information which is useful for the therapeutic decisions. While DCC gives a true quantitative measure of the receptor level, IHC locates the positive cells and gives a semi-quantitative measure. More than 55% (55-65%) of primary breast tumors and >45% (45-55%) of metastatic breast tumors contain more than 10 femtomols/mg ER in cytosol protein. Post menopausal women have higher number of ER positive tumors as compared with those of premenopausal women. Only 3% of women with ER negative tumors respond objectively to hormone therapy. ER negative breast tumors respond better to cytotoxic chemotherapy. More than 55% of women with ER positive breast tumors respond to the hormone therapy. The result of both the DCC and IHC method are comparable having significant correlation.

PS - 05 EXERCISE INDUCED HYPERTHERMIA AND FITNESS INDEX IN TRAINED AND UNTRAINED INDIVIDUALS

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74 adult healthy male subjects were taken for this study. Of these 37 trained military personnel while 37 were untrained first MBBS male students. Their height, weight and radial pulse rate were recorded. Then their oral temperature was noted B.P. was measured by auscultatory method. Then the subjects were asked to do exercise on the ‘master step’ running up and down the step at the rate of 24 times per minute maximum for 5 minutes or till the subject get exhausted. Immediately after exercise their blood pressure and oral temperature were recorded. Pulse was recorded for duration of half minute between 1 to 1½ minute (a), 2 to 2½ minute (b) and 3 to 3½ minute (c) after exercise. Finally fitness index was calculated by using following formula.
Fitness Index = \( \frac{\text{Duration of exercise in seconds} \times 100}{2 \times (a+b+c)} \)

It was seen that the exercise increases oral temperature pulse and systolic B.P. This increase is more in untrained individuals than in trained individuals. Also fitness index is less in untrained individuals than in trained individuals.

**PS - 06**

**EXERCISE PRESCRIPTION FOR HEALTHY LIFE**

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Due to technological advances, level of routine physical activity has gone down considerably. People have to pay price for this idleness in the form of various diseases like hypertension, diabetes mellitus, ischaemic heart disease etc. Hence in the recent years exercise science as a branch of medicine is making a rapid progress. The exercise prescription has both preventive as well as therapeutic aspects. In the present poster various factors, that affect formulation of exercise regimen for a normal individual, are depicted.

The poster shows the prerequisite before prescribing an exercise programme like history, clinical examination, investigations and determination of body types along with the exercises to increase muscle strength to improve cardio-respiratory endurance and to improve flexibility.

Key words :- exercise prescription, body types, types of exercises.

**PS - 07**

**CORRELATION BETWEEN WAIST HIP RATIO AND WAIST CIRCUMFERENCE AS A RISK FACTOR FOR THE DEVELOPMENT OF TYPE 2 DIABETES MELLITUS IN MALES AND FEMALES OF PUNJAB.**

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The present study was done on 300 known type 2 diabetics attending the medicine O.P.D of Rajindra hospital, Patiala after taking their written consent. There were 150 males and 150 females, all over 40 years of age. Anthropometric parameters, like waist hip ratio and waist circumferences were measured in them. It was found that the mean value of WHR in males was 1.006 (SD = 0.071) and in females was 1.005 (SD = 0.070). Statistical significance of means was not significant \( p = 0.9013 \). The mean Waist circumference was 93.12 cms, (SD = 12.218) in males and 97.9 cms, (SD = 11.516) in females. Henceforth it was calculated that whereas 84.67% males were above the risk value of WHR [0.95], 99.33% of females were above the risk value of WHR [0.80] for developing type 2 diabetes. On the other hand in case of waist circumference only 20% of males were above the cut off value 102 cms but 82% of females were above the risk factor value of 88 cms for the development of type 2 diabetes. The inference drawn was that though in maturity onset diabetes mellitus WHR was higher than the risk value in both the sexes, WC was found to be significantly higher in females. This suggested that WC alone is a fairly good predictor for the development of type 2 diabetes mellitus in women and central obesity or android pattern of obesity was more strongly associated with the incidence of type 2 diabetes in women than in men.
PS - 08 PRELIMINARY STUDY TO SEE THE SIGNIFICANCE OF LIPID PROFILE IN ISCHAEMIC HEART DISEASE AND DIABETES MELLITUS IN COMPARISON TO CONTROL GROUP

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Serum cholesterol is the major component of causal pathway of atherosclerosis and hyperlipidemia has been recognized as an important risk factor in the development of atherosclerotic vascular disease. In countries with a mean serum cholesterol level around 4 mmol/l Ischaemic heart disease (IHD) is rare, while those with means of 5.2 or more invariably have high rates of IHD.

The patient with diabetes mellitus (DM) have more incidence of IHD than the non diabetic population of similar age group.

This study suggest that there is increase of serum cholesterol level in both diseased groups P<0.01 compared with control group.

There is rise of triglyceride level in IHD and DM when compared with control group P<0.01 in both the diseased group.

The both diseased groups show decrease level of highdensity lipoprotein P<0.01 in comparison to control whereas there is increase level of lowdensity lipoprotein and very lowdensity lipoprotein P<0.01 when compared with control.

From this study it is seen that though control group represents common population has normal serum cholesterol level, some isolated groups of people have hyperlipidemia including patient of diabetes mellitus which leads to increase incidence of IHD in this groups. However a large and longer study is required to verify this.

PS - 09 A COMPARATIVE STUDY OF BLOOD SUGAR LEVELS IN NORMAL AND HYPERTENSIVE DISORDERS OF PREGNANCY

Dr. (Mrs.) Bonti Bora

Pregnancy is a condition where the body is in urgent need of various utilisable materials among which carbohydrate is an important constituent for the maintenance of not only the normal functions of the pregnant women but also that of her growing foetus. The human foetus has been at time described as a glucose dependent parasite since the glucose is the principal blood sugar of the human foetus and probably its main source of energy. A study was carried out in the department of O & G, G.M.C., among 50 cases of normal term pregnant women and so cases of women presenting with hypertensive disorders of pregnancy at term in the age group of 20-40 yrs. The outcome of the study was that the post prandial blood sugar levels in normal pregnant women showed less value than the women with hypertensive disorders of pregnancy. Fasting blood sugar estimation is not done because due to persistent removal of glucose by the foetus irrespective to mother metabollic condition there is persistently low blood sugar in fasting stat. But after the meal there is both prolonged hyperglycemia and hyper insulinaemia in pregnant women to ensure a sustained and post prandial supply of glucose to foetus.

PS - 10 VARIATION OF THYROID PROFILE IN RELATION TO AGE AND SEX

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Variation of thyroid hormonal status changes in different age and sex is mainly due to reduced peripheral conversion of T_4 into T_3 due to suppresses 5' monodefondenase activity. Serum TRH is the most sensitive thyroid function test.

Parameters of thyroid hormonal status was investigated among different age groups (15-25 yrs, 26-35 yrs and 36 - 45 yrs) in both the sexes among 75 medical and paramedical persons of different socio-economical status of Gauhati Medical College. Total T_3 & T_4 was estimated by RIA (RIA K 5/5A) and TSH (30)
by IRMA (IRMAK - 9). The Mean value of \( T_3 \) was altered but TSH was significantly high towards elderly age group \( t = 4.8 \) and in between 36 - 46 yrs Male & Female it was significantly high \( t = 2.19 \).

**PS - 11 AIRFLOW AND VENTILATORY IN ESTABLISHED BRONCHIAL ASTHMA PATIENTS RECEIVING INHALATION OF BRONCHODILATOR FOLLOWED BY COMBINATION OF BRONCHODILATOR AND CORTICOSTEROID.**

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Twenty-five clinically confirmed bronchial asthma patients (a) chest tightness (b) shortness of breath and (c) wheezing in the age group of 13-65 years attending the Department of Tuberculosis and Respiratory Medicine (Chest Medicine), Regional Institute of Medical (RIMS), Hospital, Imphal, were taken in the study group. Forced Expiratory Volume in 1 sec (FEV1), Peak Expiratory Flow Rate (PEER), Maximum Voluntary ventilation (MVV), were recorded by Medspiror-Computarised Spirometer, Recorders and Medi-care Systems* in the Department of Physiology, RIMS - Hospital, Imphal. The patients were then subjected in a stepwise pattern of measurements (1) premedication (without any medication) (2) 15 minutes after administering 200 \( \mu \)g of inhaled salbutamol (bronchodilator) and (3) 15 minutes after administration of 6 \( \mu \)g and 200 \( \mu \)g of inhaled formoterol fumarate (bronchodilator) and budesonide (corticosteroid). The results of prebronchodilator, postbronchodilator and postbronchodilator with corticosteroid will be statistically analyzed and compared.

**M - 01 PHYSIOLOGICAL CHANGES DUE TO ACADEMIC STRESS.**

Dr. Jwalit Jatinkumar Mehta, Dr. Daxina J. Mehta

Tutor in Physiology, B.J.M.C. Ahmedabad.

Professional course like M.B.B.S., requires lot of hard work for busy schedule, lectures, practical, viva exams, etc. These factors cause psychological and physical stress on students during their academic career. Psychological stress affects the disturbances in physiological functioning. The present study was conducted to find out the physiological changes during examination which is considered as teress provoking situation for the students of M.B.B.S. course. Physiological parameters like, pulse rate and blood pressure (SBP & DBP) are increased while respiratory rate, tidal volume forced vital capacity (FVC), forced expiratory volume in 1 seconds (FEV1), MEP, and peak expiratory flow rate (PEFR) were taken one day prior to examination and 2 days after examination in 42 (23 male + 19 female) 1 year medical students. Data were compared by applying students 't' test (paired) and the statistical significance was found. All the parameters showed significant increase in their values prior to examination. As the situation is over all of them come to normal values. Details of such study and results would be discussed later on.

**M - 02 DETOXICATE YOURSELF FOR RESTORING AND ENHANCING YOUR HEALTH**

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Abstract: Medication generally results into more problems especially due to suppressing the symptoms. Recovery from diseases can easily be possible through detoxicating lifestyle based on natural methods such as cleansing the body daily and controlling the body inputs for least production on new toxins. Also body exercise and rest can be well planned in a natural manner. As body and mind can be trained to deburden itself through promoting its positive trends while reducing the negative ones through thoughts and actions. Man indulges into toxin inputs usually in three ways namely:

1) For enjoyments through tempting over doses of foods and drinks
2) Enjoying the stimulations of toxic materials from tea, coffee, tobacco, wines to smack and crack.

3) Toxic medication to apparently cure the disease which ultimately rebounces in new forms. The author can support the thesis through some convincing demonstrations.

M - 03 EFFECT OF HELMET ON FIELD OF VISION & HEARING ACUITY.

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Although helmets are important for personal safety; it is often complained by riders that helmet restricts the field of vision and reduces hearing ability. In the present study field of vision was charted by using Listers perimeter and air conduction threshold was found out by modified pure tone audiometry in normal individual (n=37) with and without wearing helmet.

It was found out that the temporal and inferior fields of vision decreases significantly after wearing helmet. Also use of helmet produces mild to moderate conductive deafness at high frequencies. Since helmet is indispensable to prevent head injury, important of its use cannot be refuted, but some structural changes have to be made in the equipment to make it more comfortable and convenient to the riders.

M - 04 MEMORY IN SEARCH OF MARKS

Dr. Bhutkar M.V. **, Ms Bhadane P.R. *, Dr. Baji P.S.**, Dr. Borade N.G.***

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Memory is the ability to store and recall past events. Memory can be classified into short term memory and long term memory. Weschler memory scale is considered as a standard test for short term memory.

The aim of present study was to find out whether there is any correlation between short term memory and Multiple Choice Questions (MCQ's) and Long Answer Questions (LAQ's) marks in the internal assessment examination. In the present study 120 first MBBS students were tested with Weschler memory scale and there Memory Quotient (MQ) was found out. It was observed that coefficient of correlation between MQ and MCQ marks was higher than that between MQ and LAQ marks. Hence it can be inferred that contrary to their purpose the MCQ's test the short term memory i.e. factual information only.

M - 05 EFFECT OF VAGOTOMY ON IMMOBILIZATION STRESS INDUCED ALTERATIONS IN BODY WEIGHT AND OXIDATIVE STRESS IN RATS.

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Vagus nerve is known to influence the effects of stress on the body. However, the role of vagus nerve on stress-induced alteration in body weight and oxidative stress has not been studied yet. Therefore
in the present study, we have assessed the effect of vagotomy on immobilization stress induced alteration in body weight and oxidative stress in male Wistar rats. Twelve animals were taken for the study and were divided equally into two groups control group (non-vagotomized group) and experimental group (vagotomized group). Bilateral truncal vagotomy was performed in all animals of experimental group. The effects of forced immobilization stress (30 minutes per day) on body weight and oxidative stress were studied for 21 days. In control animals, there was a significant decrease in the body weight initially for 5 days, after which it slowly regained to basal level on 14th day and then increased throughout the period. In experimental animals, following vagotomy there was a significant decrease in post-vagotomy basal body weight. The decrease in body weight and increase in oxidative-stress was more pronounced and sustained and remained significantly altered even after 21 days. It was concluded that the recovery of body weight and oxidative-stress in stress situations is mediated by vagus nerves, as truncal vagotomy suppresses there recovery response.

M - 06 CAN WAIST-HIP RATIO BE A PREDICTOR OF PHYSICAL FITNESS AMONG FEMALE MEDICAL STUDENTS?

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In different forms of sports and games the type of movement are variable and body posture is also quite different. The aspects of physical functioning is mostly affected by bending, kneeling, stopping, running and jumping. Compared to normal-weight subjects (BMI : 18.5-24.9 kg/m²), and waist hip ratio > 0.95, waist circumference > 88 cm. in women is considered as obese. This could play an important role in determining the physical fitness of the subject.

M - 07 PHYSIOLOGICAL BASIS FOR APPLICATION OF ERGONOMICS IN INDUSTRY FOR ENSURING SAFETY, HEALTH AND PRODUCTIVITY OF INDUSTRIAL POPULATION

Sri P C Ghosh

Ministry of Labour

Abstract: In an automobile ancillary unit three different jobs such as the inspection of seta, repairing of damage seat, & forklift drivers operation for storing the materials in ARS system have been evaluated for ergonomics mismatching if any on the request of the management. Majority of the auto industry will have continuous nature of operation with limited breaks. Ergonomics evaluation was carried out with the help of various physiological parameters measured in shop floor during the actual operation throughout the shift period. The basal physiological states of the working population. After basal recording the subjects were allowed to commence tasks as per their normal schedule. The jobs are evaluated during the morning shift from 0600 hrs to 1400 hrs daily. The physiological parameters used for evaluation are working heart rate, O₂ uptake, energy expenditure, and the working oral temperature in °C was used before the intervention programs as well as after the implementation of suggested recommendations. The total numbers of the subjects were twenty four males who were doing the operation. The oxygen uptake was computed from working heart rate in lit. min⁻¹ with the help of. The oral temperature was recorded with the help of a clinical thermometer pre-placed under the tongue for three minutes immediately after the cessation of work. The personal data with their job experience was also recorded and presented in various tables. The same parameters were used for evaluation of jobs after the implementation of intervention program to ascertain the effect of physiological benefit gained from intervention program on human comfort, safety, and productivity at work during the follow up study. This was the main aims and objectives of the study as it was a request from management. The findings are presented in tables and other forms to make the
working situation more comfortable, safe, and productive.

The experimental values have clearly demonstrated the beneficial effect among the workers. The management has implemented the suggestion based on our results. The working heart rate, energy expenditure, and $O_2$ uptake have shown reduction after implementation of suggestion suggesting the convincing observation for the management. However, the oral temperature did not show any appreciable change as the nature of jobs was low average in intensity. As far as the productivity was concerned the operation has shown a definite increased with less physiological cost. The endurance time was also shown a decreased from their pre-to-post implementation stage. The physiological relief has convinced to the management to implement the suggestion given to them for improvement. This is a successful case studied from industrial physiology & ergonomics department from the institute to show that the physiological observations will be the key factor for the management for improving the working situation, work, work station etc. If it is evaluated through the physiological techniques rather than the engineering processes. It is superior, accurate, and convincing to management for implementation. Author acknowledges with thanks the technical services of many officers during the period of field collection of data preparation of the study paper and all the employees and the management for cooperation during the study.

M - 08 ETHICAL AND LEGAL ISSUES IN GENETICS
Dr. L. Kalavathi

Genetic counselling is an educational process that seeks to assist affected and/or at risk individuals to understand the nature of the genetic disorder, its transmission and the options open to them in management and family planning.

Ethical and legal issues faced by the patients and doctors concerned are many.

Legal issues about confidentiality and informed consent may arise. Right to Privacy of a woman may be threatened.

Ethical issues in obstetrics may be regarding stigmatization, discrimination, increase in family conflicts, disclosures to relatives, employers and insurers and misattributed paternity.

Ethical issues in paediatric genetics regarding children's autonomy and their role in consent process especially for carrier testing is important. Other ethical issues like stigmatization, disturbance of parent-child bonding, long term privacy of genetic information, parental misunderstanding of test results in treating a carrier child as an ill or potentially ill child have to be carefully handled.

A genetic counsellor should provide to the consultand:
* the medical diagnosis, prognosis, possible treatment,
* the mode of inheritance of the disorder and the risk of developing and/or transmitting it,
* the options available for dealing with the risks.

The consultand should reach their own fully informed decisions without undue pressure or stress.

M - 09 A STUDY OF AWARENESS ON HUMAN SEXUALITY AND AIDS AMONG NEWLY ADMITTED MBBS STUDENTS
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Associate Professor
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The aim of the present study was to know the awareness about human sexuality and AIDS among
100 newly admitted MBBS students (54 males and 46 females), RIMS, Imphal. The survey was done by a pre-designed and self-administered questionnaire comprising of 50 questions. After analysis of these data, it is found that 76% students believed menstrual cycle is the first sign of puberty in female. 21 students thought that contraceptive methods are applicable only to females. 30% students understood corpus luteum releases ovum and 34% knew that lactation strats at the beginning of pregnancy.

93% students could write the full form of AIDS and 11% thought that AIDS is curable. 11% believe that mosquitoes/flies can transmit AIDS. 47% thought that hospitalization is must for all AIDS victim. 58% of them did not attend any lecture/seminar/workshop about sex education/AIDS, 95% desired to have sex education at school level and 98% wanted to know more about AIDS.

This study showed that more sex education and knowledge of AIDS are required to be given at school level, so as to have the awareness of the sex-linked diseases since school life and also will be helpful to prevent AIDS as well.

**M - 10 A NOVEL METHOD OF TEACHING AND LEARNING**

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To inspire the self learning in students and to make teaching-learning process more interesting, quiz competitions were conducted in physiology. Students' views were assessed about the "QUIZ COMPETITIONS AS A TOOL OF TEACHING AND LEARNING".

Results indicate quiz competitions definitely help the students in making learning an interesting experience, in creating interest in the subject, in developing team spirit, in developing keenness in participating in the learning process, to refer more number of textbooks, to read the topic in depth and to increase desire for learning more and more about the subject.

Such competitions help in developing MCQ banks & their validation & getting feedbacks to improve teaching.

**M - 11 "A COMPARATIVE STUDY ON AUTONOMIC FUNCTIONS IN NORMAL AND OBESE YOUNG INDIAN FEMALES"**

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The study was conducted on M.B.B.S. students of Lady Hardinge Medical College, New Delhi. A total of 16 subjects were selected, which included 10 normal weight (BMI=20-25kg/m²) & 6 obese students (BMI>30 kg/m²). None of them was suffering from any medical/psychiatric disorder and was not taking any medication which can influence autonomic system. Autonomic nervous system was evaluated for parasympathetic functions using Deep breathing (E : I ratio), Valsalva maneuver (R-R ratio) and sympathetic function tests using Cold pressor test (BP, PR), Handgrip dynamometer endurance (BP, PR). The raw data was analyzed using paired t test and ANOVA. The study revealed the following facts. The mean basal systolic and diastolic pressures were higher in obese as compared to normal weight subjects. On being subjected to sympathetic tests viz handgrip and cold pressor test the percentage change in cardiovascular parameters were comparable in obese and normal subjects. The record taken after the completion of the test showed the same trend in both the groups as seen in the basal state. It was inferred that the sympathetic activity was not any different in obese as compared to the subjects with normal body mass index during the tests. As for the parasympathetic functions the R-R ratio during Valsalva was significantly higher in obese as compared to normal weight subjects. However the E : I ratio calculated for Slow breath-
ing test was not significantly different in two groups. These observations suggest a possibility of different parasympathetic activity and reactivity in normal weight and obese subjects in view of altered cardiovascular haemodynamics and respiratory physiology in obese state. The analysis and discussion of the complexities of autonomic profile in normal and obese subjects shall be presented in detail.

M-12 ‘COMPUTER- AIDED INTEGRATED LEARNING: POSSIBILITIES OF DISTANCE EDUCATION IN MEDICINE’

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In the new millenium, computers have become an inseparable part of our day to day life. The world wide web and information superhighway - offers us enormous scope and potential. It is a powerful medium and a tool which can be used effectively to create interesting teaching-learning modules for students who often are more computer savvy than their teachers.

Considering the fact that the I MBBS course has become a 1 year stint, it is the need of the hour for the Basic Science teachers to make the teaching of the 3 basic sciences an integrated affair and prepare teaching material that is user friendly, and is available on CDs or on the net.

On the internet, such material exists, and it is an inspiration for us as teachers. We can use this freely available material, add on to it, and prepare our own material. This would be a challenging and creative endeavour and also improve our computer skills.

Distance Education is a concept that allows a medical student sitting in a remote area of the country with access to the internet, to study materials prepared by experts of any institution around the world. It can also be used as a tool to provide Continuing Medical Education for Medical Practitioners.

Students these days should be encouraged to be self and life long learners and if we encourage them to use the computer as a learning tool - they can do their learning at flexible hours and as per their learning needs.

Of course, in the present day scenario, this cannot be the only mode of learning but as the climate of the times is changing towards innovations in medical education, this is an exciting and relevant proposition.

PG - 01 STUDY OF BODY COMPOSITION OF SOCCER PLAYERS: MANIPUR PLAYERS VS REST OF INDIA

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Regional Institute of Medical Science, Imphal

Optimum Body Composition is of paramount importance which determines the performance of soccer players. A study was undertaken among the players of the semi-finalists of L G Santosh Trophy held at Imphal from 17th October to 5th November, 2002. Analysis of body composition of 18 Manipur soccer players and 56 soccer players from Kerala, Goa and Services was done by using Tanita's Body Composition Analyzer based on Bioelectrical-impedance method. It was found that body composition variables like fat%, fat mass and higher fat free mass have added advantages for the Manipur players over the other players of India.

PG - 02 PEAK EXPIRATORY FLOW RATE (PEFR) IN RELATION TO BODY SURFACE AREA (BSA) IN HEALTHY MALES

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The measurement of peak expiratory flow rate is useful in the clinical assessment of airway obstruction. A wide range of geographical variation, climatic conditions and anthropometric parameters are associated with difference in lung functions in various parts of the world. The present study was under-
taken to assess the PEFR and to determine the relationship between PEFR and body surface area. The measurement was carried out in 100 normal healthy respiratory symptom free medical students (both male and female) in the age group of 18 to 21 years, by a Wright peak flow meter. The data were statistically analysed to obtain the mean, standard deviation values and the correlation of PEFR with body surface area was made.

The mean PEFR recorded in male subjects was found to be 5921/min (± 88.7) and for female subjects 4141/min (± 45), and correlation coefficient analysis showed a positive correlation of PEFR with body surface area in both male and female. In male the increase was highly statistically significant (p < 0.001) while in female the increase was not statistically significant (p>0.05).

**PG - 03** SURVEY ON ANTIPYRETIC USE - A QUESTIONNAIRE STUDY; AT MANIPAL GROUP OF HOSPITALS

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**Objective**: To study the choice of antipyretics based on the experience of the consultants in different specialties. This is imperative in view of the ongoing nimesulide controversy.

**Methods**: A structured questionnaire was presented in person to 104 consultants in departments of Medicine, Paediatrics, Surgery, Obstetrics & Gynaecology, Urology, ENT, Orthopedics and Dermatology at Manipal group of hospitals located at Manipal, Udupi, Bangalore, Mangalore and Sikkim. Questions were related to the choice, effectiveness, side effects, safety of the drug and the temperature at which it is prescribed.

**Results**: Paracetamol was most commonly (93%) prescribed, is most effective (73%) and the safest (96%) antipyretic. Commonest side effect with Paracetamol was gastritis (17%). Side effects attributed to Nimesulide included; Elevated liver enzymes (15%), followed by hypothermia (12%), gastritis (10%) hepatic failure (6%), rarely skin rashes (3%), edema (2%), oral ulcers (1%), renal failure (1%), and arrhythmia (1%). 19% of consultants were not using Nimesulide at all. Almost all (93%) do not estimate liver enzymes when antipyretics were prescribed for short duration. Majority (61%) prescribed antipyretic at temperature > 101°F and 32% at temperature > 99°F.

**Conclusion**: This preliminary study may help us to promote rational use of antipyretics, which could be facilitated by periodic feedback from prescribers.

**PG - 04** EFFECT OF IRON DEFICIENCY ANAEMIA ON AUDITORY BRAINSTEM RESPONSE

Dr. Madhulika Monga, Dr. Veena Walia, Dr. Asha Gandhi
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Iron deficiency is a common nutritional deficiency in children. Iron plays an important role in neurotransmitter synthesis and myelination. Thus iron deficiency at a time when the brain maturation and myelination is ongoing would affect the brain functions. In this preliminary study the effect of iron deficiency anaemia on auditory brainstem response is investigated. The study includes 8 inch deficient anaemic children between six to twenty-four months of age (group I) and 4 healthy age matched controls (group II). Iron deficiency anaemic was taken as Hb<10.5g/dl; MCV<70fl; MCH < 23pg; MCHC < 30g/dl and peripheral blood smear showing microcytic hypochromic RBC. The statistical analysis was done using Student's t test and Mann Whitting U test. We found that the absolute latency of wave I and wave III was longer in group I (p<0.001). The absolute latency of wave V, wave I-III IPL and Wave III-V IPL showed significant increase in group I (p<0.01). The preliminary findings could be due to an increased conduction time between cochlear nerve and superior olivary nucleus (wave I-III IPL); and between superior olivary nucleus and inferior colliculus (wave III-V IPL) in iron deficient anaemic children. The increased conduction time suggests altered myelination in group I i.e. iron deficient anaemic children. Our findings thus support the
hypothesis that iron deficiency anaemia in infancy alters myelination and effects transmission through auditory system (C. Algarin 2003).

Key words: Iron deficiency anaemia Myelination Auditory Brainstem Response Conduction time

PG - 05 ROLE OF ACADEMIC/PHARMACEUTICAL COMPANIES/GOVERNMENT IN DRUG DEVELOPMENT

Dr. Sumedh Gaikwad

Drug development is a highly complex operation involving multi-disciplinary project teams, engaged in discovery & development activities over a number of years. It is usual for a discovery project to take several years before finding a compound regarded as suitable for years before finding a compound regarded as suitable for development as a new pharmaceutical product, after which it takes many years to steer the compound around many obstacles to commercial relaisation. The standards that are acceptable in terms of quality, safety and efficacy as seen by manufactures, the medical profession, the govt. regulatory authorities and the patients are very demanding and constantly rising. The complexity of medical problems is increasing and the cost and time required to discover and develop a new product continue to escalate.

In the whole of this process of drug development Academic, Pharma houses and Govt. has their own key roles. Looking at today's reality about Indian scenario and drug development in Western countries; it is high time to realise our strength and collective abilities for successful research programme. For this partnership and collaboration are the keys. This only can lead to successful road map to the clinical research and drug development.

PG - 06 IMPAIRMENT OF BETA-2 ADRENOCEPTOR RESPONSES BY REACTIVE OXYGEN SPECIES IN GUINEA PIGS.

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Reactive oxygen species (ROS) have been proposed to play an important role in the pathogenesis of asthma. We carried out a study to examine the effect of in vivo generation of ROS on airway responses to β2 adrenoceptor agonists. After baseline measurement of specific airways conductance (SGaw) in 9 nonsensitized, spontaneously breathing guinea pigs in a body plethysmograph aerosolized salbutamol (0.25 mg/kg) was given for 30 sec and airway response was measured continuously for 20 min. The increase in SGaw from the baseline SGaw was computed to assess the degree of bronchodilation. In the same animals the next day successive inhalations of xanthine (0.1 %) for 3 min and xanthine oxidase (1U/ml) for 5 min was given to generate ROS in vivo. After 30 min, bronchial response to inhaled salbutamol was again monitored in these animals. The bronchodilator responses to inhaled salbutamol on 2 days, one prior to xanthine - xanthine oxidase exposure and one after the exposure were compared. Increase in SGaw in response to inhaled salbutamol before and after xanthine-xanthine oxidase exposure was significantly different. Before xanthine-xanthine oxidase exposure, inhalation of salbutamol produced a 35.5% increase in SGaw i.e. 0.054 ± 0.003 cm H2O while after xanthine-xanthine oxidase exposure the increase was only 13.46% i.e. 0.02 ± 0.002 cm H2O (p<0.0001). These results provide evidence that generation of ROS impairs β2 adrenoceptor function. This is likely to be of pathogenetic significance in asthma.

PG - 07 EFFECT OF IRBESARTAN IN STZ-INDUCED DIABETIC NEPHROPATHY IN RATS.

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Diabetic nephropathy (DN), a tragic illness is the commonest cause of end-stage renal failure in the developed world. Despite considerable research we still do not have comprehensive explanation for the
In the present study effect of Irbesartan-an angiotensin-II receptor antagonist was evaluated in streptozotocin (STZ) induced DN in rats.

Albino rats (250-300g) of either sex were used. DN was induced by injecting STZ (50mg/kg, i.v. single dose). Animals were divided into 4 groups of 10 each: GP-I control, GP-II-diabetic (STZ), GP-III-Irbesartan (20mg/kg p.o) daily, 5 days prior to STZ and continued for 16 weeks + STZ. GP-IV-Insulin (6U/day, s.c.) + STZ. Routine blood and urine tests (Blood sugar, Blood urea, Blood creatinine, urine volume and protein, urine creatinine and urine electrolytes) were performed every month for 4 months.

Results of present study revealed marked hyperglycemia, polyuria, proteinuria, elevated serum creatinine and blood urea levels in STZ rats. Irbesartan pretreated diabetic animals showed a significant reduction in proteinuria, blood urea and serum creatinine, as well as a significant natriuretic effect. Similar observations were also observed with insulin. The study thus suggests that irbesartan prevents progressive nephropathic changes in diabetic rats.

**PG - 08**

HEPATOPROTECTIVE ACTIVITY OF ALCOHOLIC EXTRACT AND THE RESIDUAL PART (ALCOHOLIC EXTRACT FREE) OR CURCUMA LONGA LINN (TURMERIC) IN ALBINO RAT.

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**Study place :** The present work was conducted in Pharmacology, Department, Assam Medical College, Dibrugarh, Assam in the year 2002-2003.

**Objective :** The objective of the study was to evaluate the hepatoprotective effect of Alcoholic extract and Residual part of commonly used spice Curcuma longa linn (Turmeric) on Paracetamol induced hepatotoxicity in Albino rat.

**Materials and Methods :** Healthy Albino rats of either sex were taken and divided into five groups. Group - A was kept untreated for control, Group-B received a single dose of Paracetamol 2 gm/kg, Group-C received Alcoholic extract of Turmeric (AET) in the dose of 150mg/kg/day and a single dose of Paracetamol 2gm/kg. Group - D received Residual part (Alcoholic extract free) of Turmeric (RT), 150 mg/kg/day and a single dose of Paracetamol 2 gm/kg and Group - E received Silymarin 100 mg/kg/day and a single dose of Paracetamol 2 gm/kg. Liver function tests and the histopathological examination of the liver was done in all the five groups of rats at a gap of 15 days for total 45 days. The function of liver was judged from serum bilirubin, plasma protein, serum marker enzymes (SGOT, SGPT, Serum alkaline phosphatase), gross appearance and histopathological examination of liver.

**Results and observations :** Results were analysed by student t-test, Group - B containing Paracetamol shows significant (P<0.05) increased level of all enzymes and decrease in plasma protein level as the time progresses in comparison to Group - A. Group - C and Group - E showed hepatoprotective activity, confirmed by almost normalization of the level of protein and enzymes. On the other hand in Group-D showed significant (P<0.05) increase in the level of all enzymes other than serum alkaline phosphates and decrease proteins level. The results were confirmed by histopathological examination of liver sections, which shows regenerative areas in Group - C and E. As compared to Group - E, Group - C showed more hepatoprotective activity.

**Conclusive :** To conclude, AET gave significant protection but not the RT against Paracetamol induced hepatotoxicity. Though with AET the values did not reached normal level and that it is better hepatoprotective than Silymarin.

**Keywords :** Curcuma longa linn, Turmeric, Alcoholic extract, Hepatotoxicity, Hepatoprotective activity, Paracetamol, Albino rat.
PHYSICAL FITNESS: A COMPARATIVE STUDY BETWEEN FIRST YEAR MBBS STUDENTS OF URBAN AND RURAL AREAS.

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Fitness index of total 142 First year MBBS students of our college were carried out by Harvard Step Test, in which there were 80 students from urban areas and 62 students from rural areas. Depending upon the scores of fitness index, they were categorized as poor (<50), average (50-80), and good (>80). Results showed that students of rural area had poor fitness index with less fitness index score (Mean ± SD 59 ± 17.90) as compared to urban students (Mean ± SD 80 ± 19.30). Improper nutritional status and unawareness about balanced diet may be the responsible factor for poor physical fitness in the rural students. Further study with a large sample size may reveal more information.

Key Word: fitness index, urban students, rural students

HAEMATOLOGICAL PROFILE IN NORMAL AND TOXAEMIA OF PREGNANCY IN MANIPURI WOMEN

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The present study was conducted on 90 Manipuri women of 18-35 years age group to see the haematological changes in normal and Toxaemia of pregnancy. Out of these, 30 cases were of normal pregnancy in 3rd trimester, 30 cases were of Toxaemia of pregnancy and the remaining 30 cases were of non-pregnant women who served as control.

Hb% (9.888 ± 0.44) in 3rd trimester decreased significantly (P < 0.001) as compared to the control group (11.2968 ± 0.477) and again decreased in PET cases (9.400 ± 0.465). The prothrombin time in control was 11.716 ± 0.641 sec. In the normal pregnancy, prothrombin time (10.312 ± 0.976) was decreased significantly (P < 0.001) but increased (11.596 ± 0.843) in PET groups. There is significant (P < 0.001) decrease in platelet count/cu mm from control group (265680 ± 40289.29) to 3rd trimester (206560 ± 48858.71) and again decreased in PET group (174720 ± 36895.71). There is significant decrease in haematocrit and increase in total leukocyte count in normal pregnancy and PET cases.

ANTIMITOTIC ACTIVITY OF LATEX OF CALOTROPIS PROCERA IN ALLIUM CEPA MODEL.

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Calotropis procera a wild growing plant is well known for its many medicinal properties. We have studied the antimitotic activity of the dried latex (DL) of the plant and compared it with cyclophosphamide, an alkylating agent with known antimitotic activity. The Allium cepa bulbs were placed in water till roots...
attained a length of 2 cm. Bulbs were then divided into 3 groups and kept in water (control), 0.01 mg/ml solution of DL, 0.01 mg/ml solution of cyclophosphamide. Mitotic cell count and root length were measured at 0, 24, 48, 72, 96h. C. procera decreased the mitotic cell count in a time dependent manner while the antimitotic effect of cyclophosphamide was not time dependent. Treatment of roots with DL led to mitotic arrest in prophase and inhibition of mitotic activity by 48% at 72 h. In the cyclophosphamide treated group all the stages of mitosis were observed but the count was significantly less as compared to the control. The percent inhibition by 0.01 mg/ml of cyclophosphamide was 32% at 72h. Thus our study indicates that both DL and cyclophosphamide inhibit mitosis by different mechanism.

PG - 12 EFFECT OF INDIAN RED SCORPION VENOM ON VASOSENSORY REFLEXES IN ANAESTHETIZED RATS
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Indian red scorpion (Buthus tamulus; BT) venom produces severe cardio-respiratory alterations which are mediated through the actions directly or indirectly via the reflex mechanisms. The involvement of vasoconstrictor reflexes for the above actions of BT venom is not known. The present investigation was conducted to examine the effects of BT venom on the vasoconstrictor reflexes. These reflexes were elicited by injecting venom in the peripheral end of femoral artery in anaesthesitized rats. The effect on blood pressure (MAP), heart rate (HR), and respiration rate (RR) were recorded. BT venom-induced changes on MAP, RR and HR began immediately and continued up to 60 min. BT Venom produced immediate decrease, followed by sustained increase in MAP with little fluctuations lasting for 60 min at different concentrations (0.50-2 mg/kg body weight). In case of RR there was instantaneous (<2 sec) increase, then a transient decrease and finally a sustained increase up to 60 min was seen after envenomation. Whereas no immediate changes in HR was observed but, a delayed bradycardia was seen after 5-10 min. The responses on all these parameters were maximal at 1mg/kg of BT venom. As no changes were seen after the injection of equal volume of saline, the effects of BT venom were not due to the volume/stretch of the blood vessels. The data provide evidences for the excitation of peripheral sensory receptors governing the systemic cardiorespiratory changes by venom. These sensory receptors are postulated to exist around the peripheral vessels and are excited by nociceptive stimuli. This work demonstrate the involvement of vasoconstrictor reflexes in the toxicity of BT venom.

PG - 13 POST PRADIAL STATE DOES NOT ALTER AUTONOMIC STATE
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Bangalore

PG - 14 USE OF ADVANCED COMPUTER SOFTWARE FOR PREPARATION OF EDUCATIONAL CD'S
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The computer has literally invaded all walks of life and education is no exception to it. It is a well accepted educational principle that demonstrate of experiments or mechanisms improves the understand-
ing of subject and clarity of concepts in the student fraternity. To take advantages of this fact a few computer aided teaching systems are available in the market. However they suffer from certain drawbacks like most of them cover the subject only superficially and the teacher cannot make changes in the data even if he desires so. In present study we have demonstrated the use of an advanced animation software called Flash 5.0. To prepare educational CD’s in physiology the biggest advantage of its use is that the CD’s can be tailor-made as per the requirements of the teachers and the students. This not only helps the teacher to explain intricacies of the subject but also enables him to modify the data when need may arise.

PG - 15  ANTIDIARRHOEAL ACTIVITY OF LATEX OF CALOTROPSIS PROCERA

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The dry latex (DL) of Calotropis procera, a potent anti-inflammatory agent has evaluated for its anti-diarrhoeal activity against castor oil induced diarrhoea and enteropooling. The effect of DL on small intestinal transit was also recorded. A single oral dose of DL (500mg/kg) produced a statistically significant reduction in the frequency and severity of diarrhoea. DL delayed the onset of diarrhoea and afforded protection from diarrhoea in 80 rats at fourth hour and the results were comparable with atropine and phenylbutazone (PBZ). Further, DL significantly inhibited the castor oil induced enteropooling by 50% and produced 37% decrease in intestinal transit but did not alter the electrolyte concentration in the intestinal fluid. The results indicate that DL of C.procera possesses significant anti-diarrhoeal activity due to its inhibitory effect both on gastrointestinal propulsion and fluid secretion. (SA is a Senior Research Fellow of CSIR, New Delhi).

PG - 16  STUDY OF BODY MASS INDEX AND WAIST HIP RATIO AMONG CORONARY ARTERY DISEASE PATIENTS

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Study of BMI and WHR profile of subjects suffering from coronary artery disease in the age group of 30 yrs and above, attending dept of cardiology, Gauhati Medical College & Hospital, was carried out. A total of 35 subjects were assessed. For each subject, height, weight, waist and hip circumferences were measured and recorded. BMI and WHR were thus calculated for each subject. 25.7% (n=35) of subjects had their BMI values in the overweight category while 51.4% (n=35) of subjects had their WHR raised above the acceptable limit. The data obtained were compared with other studies elsewhere. The results point towards the existence of a possible relation between coronary artery disease and raised BMI & WHR, in this part of the country as well. More studies need to be undertaken to substantiate this hypothesis.

PG - 17  VISUAL EVOKED RESPONSES DURING FOLLICULAR AND LUTEAL PHASES OF MENSTRUAL CYCLE


The VEP is a gross electrical response, which reflects processing of visual information from the macular area of the retina through the optic nerve to the occipital cortex. Many workers have reported consistent differences in VEP latencies in healthy males and female subjects. Most of them have studied P100 latency exclusively. The reason behind these differences has always haunted us and various variables like hormones, body temperature, skin thickness have been blamed from time to time. In our study we have tried to study the latencies and amplitudes of all the three waves N70, P100 and N135 of VEP.
recording during follicular and luteal phases of menstrual cycle. We picked up 40 healthy female medical students from our university, the particular phases of menstrual cycle were determined by regressive counts. Latencies for all the three waves were found to be significantly longer during the luteal phase. Amplitude of N 70 wave was higher during the luteal phase but that of P 100 and N 135 was although higher during the luteal phase but the difference was not statistically significant. These differences during the two phases of menstrual cycle are largely attributed to the estrogen and progesterone. These hormones have profound effect on neuronal excitability and conduction velocity. They exert these effects mainly through their action on ionic channels and protein as GABA-A and NMDA receptors. The results emphasize that the menstrual phase is an important variable to be considered while performing neurophysiological studies on women.

Introduction -

The reproductive system of the female, unlike that of the male, shows regular cyclic changes that may be regarded as periodic preparations for fertilization and pregnancy. The sexual cycle in female is characterised by rhythmic changes in the rates of secretion of the female hormones and corresponding changes in the ovaries and sexual organs as well. The ovarian cycle can be further divided into follicular and luteal phases, whereas the uterine cycle is divided into corresponding proliferative and secretory phases. During Follicular phase the hormonal feedback promoted the orderly development of a single dominant follicle, which should be mature at midcycle and prepared for ovulation. The length

**PG - 18** EFFECT OF ACUTE EXERCISE STRESS ON COLD INDUCED PAIN


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**Aims and objectives**: Pain is the most common medical problem in the world. It is a well-documented fact that exercise causes modulation of pain perception, but there are controversial reports regarding this modulatory effect. In this context, our study aim to determine the effect of exercise stress on acute cold induced pain.

**Materials and methods**: Normal healthy adult male volunteers (n = 7) were selected to perform the standard cold pressor pain test (immersion of right hand in 2-4°C water) before and after exercise stress test (60% of maximum heart rate with bicycly ergometry) and pain threshold and pain tolerance times were noted.

**Results**: The trend shows a slight increase in pain threshold (9.22 ± 4.379.23 sec vs. 10.43 ± 4.24 sec) and a marked increase in pain tolerance time (23.6 ± 9.33 sec vs. 33.15 ± 8.51 sec) and therefore, pain duration (15.72 ± 5.35 sec vs. 21.00 ± 6.6 sec) in all subjects except one, just after exercise.

**Conclusion**: It can be concluded that acute exercise induced stress modulates cold induced pain, the perception of which decreases markedly just after exercise.

**PG - 19** EFFECT OF GENDER OF HEART RATE VARIABILITY OF LOCAL HEALTHY ADULT POPULATION

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**Objectives**: The objectives of the study was to investigate the effect of gender on parameters of Heart Rate Variability (HRV, oscillation in the consecutive cardiac cycle length) in local healthy adult population.

**Material and methods**: The study was conducted on volunteers of both sexes (n = 85). They were
grouped age-wise: 17-24 (group I), 25-34 (group II), 35-44 (group III) years. After 15 min rest, continuous 5-min long ECG was recorded. After removing ectopic beats/artifacts, successive R-R intervals were measured. Different HRV parameters mean R-R intervals and their standard deviation (NNSD), successive R-R interval differences and their standard deviation, root mean of squared successive R-R interval differences (RMSSD), successive R-R interval differences ≥ 50msec (NN50) (Count) and its percentage (pNN50) (%) were calculated.

**Results:** RMSSD showed increasing trend in females of group I and II (49.5 ± 21 vs. 59 ± 23.5 ms and 39 ± 18 vs. 43 ± 12.5 ms respectively), NN50 in group I and III (99 ± 77 vs 130 ± 65.3 and 46.1 ± 47 vs 57.1 ± 43 respectively) and pNN50 in group I (29 ± 22 vs. 39 ± 21).

**Conclusion:** The trend shows greater HRV parameters in females which indicate greater vagal modulation in them as compared to their male counterparts. This higher vagal modulation has been suggested to be cardio-protective in females.

**Key words:** heart rate variability, males, females, cardio-protective

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**PG - 20 EVALUATION OF ADAPTOGENIC ACTIVITY OF GLYCYRRHIZA GLABRA (GB) EMPLOYING BIOCHEMICAL APPROACH IN RATS.**

S. Satyanarayana, B. Krishna Murthy, K. Eswar Kumar, A. Ramesh and J. Raja Sekhar.

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Glycyrrhiza Glabra (GB) is widely used as a traditional ayurvedic medicine to treat stress related disorders. In the case of stress corticosteroid synthesis which is dependent on adrenal ascorbic acid excretion, similarly catecholamine levels change with changes in their urinary metabolite like vanillyl mandelic acid (VMA). The present work was conducted to find the influence of swim test (stress) on urinary ascorbic acid and VMA before and after treatment with and without the treatment of aqueous extract of GB. The stress was induced to rats by making them in fresh water until exhausted. The 24 hrs urinary AA and VMA were estimated by Roe & Kuther and Pisanos methods respectively. GB was administered to rats at a dose of 50, 100 and 200 mg/kg body weight to find its dose response relationship in inhibiting stress induced changes in urinary ascorbic acid and VMA. The normal levels of ascorbic acid and VMA in 24 hr urine sample by each group were 140.1-190.5 μg/hr/24 hr and 120.5-200.8 μg/kg/24 hr respectively. In stress conditions the ascorbic acid levels decreased to 80.1-90.4 μg/kg/24h while VMA levels increased to 240.6-310.9 μg/kg/24. It was observed that prior treatment with GB extract produced dose dependent blockade of the urinary AA and VMA changes seen in stress. On cessation of treatment, they returned back to normal, indicating reversible nature of the blockade with GB extract. The GB extract showed antioxidant activity in in-vitro tests and such activity appears to be responsible for the antistress (adaptogenic) activity.

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**PG - 21 CORRELATION BETWEEN OF ECG CHANGES SPIROMETRIC PARAMETERS IN OBSTRUCTIVE RESPIRATORY DISORDERS IN ASSAMESE POPULATION.**

Rituparna Barooah

The ongoing study was conducted in the Gauhati Medical College during the pa year. Spirometric
examination was done in 40 no of cases known cases of obstructive pulmonary disorders both reversible and irreversible, and simultaneous electrocardiographic changes were noted and of which 28 were male and 12 females along with 80 normal subjects of which 42 were male and 38 were female. The smoking habit was taken into account.

The concurrent changes in ECG were noted in respect to P-wave morphology and I wave axis, QRS voltage And axis, T-wave inversion, flattening and axis, right ventricular atrophy and other associated findings.

The spirometric parameters included in the study were measurement of vital capacity FEV1, FEV1/FVC, PEFR, MMEF. Residual volume an the total lung capacity carried out with the help of computerized flexi flow spirometer.

The subjects were both indoor and outdoor patients and three types of subject were included.

• Those with reversible obstruction
• Those with irreversible obstructive disorders e.g. chronic bronchitis and emphysem without failure
• Emphysematous cases who have developed chronic cor pulmonale and right ventricular hypertrophy

The following positive changes were noted.

• Increase severity of COPD with increasing deteriorating lung function associated with progressive right axis deviation of the P-wave and progressive right QRS deviation.
• Low voltage of QRS with lateral "fall off" in voltage.
• Increased amplitude of T-wave rightward deviation of the axis.

PG - 22 EFFECT OF HERBAL COMBINATION ‘UNIBONE’ IN LOW BONE MASS DENSITY PATIENTS.

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1 MBBS, Post Graduate student in Pharmacology, Government Medical College, Nagpur.

Primary: To study the efficacy of herbal combination of Cissus Quadrangularis, Withania Somnifera and Ocimum Sanctum on bone mineral density (BMD) and biochemical parameters in low BMD patients. Secondly to see the tolerability of herbal combination.

Method: In a prospective, double blind, randomized, placebo controlled trial, 30 low BMD patients were randomly entered to receive either active drug or placebo, in a dose of three capsules daily for six months. Bone density by DEXA scan, biochemical estimation of serum alkaline phosphatase, calcium and phosphorus were done pre-treatment and after six months run-in. The drugs were decoded at the end of the trial.

Results: There was a significant improvement in bone density parameters viz BMD, T score and Z score in active drug treated patients while reduction in bone density was noted in those receiving placebo. There was significant reduction in serum alkaline phosphatase in drug treated group.

Conclusion: The herbal combination had statistically significant beneficial effect on BMD without any ADRs. It can be used as an alternative to established therapies of osteoporosis with advantages of being indigenous, natural economical and safe.
PG - 23  THE EFFECT OF NIGELLA SATIVA LINN (BLACK CUMIN) ON BLOOD LIPIDS IN HYPERCHOLESTEROLEMIC RABBITS.

Kakaty. P¹, Bezbaruah. B.K², Lahkar M³, Ojha P.K⁴

Nigella Sativa is a Ranunculaceae family plant which has been used as a herbal medicine for more than 2000 years. Recently, the volatile oils of nigella sativa are used therapeutically and claimed many benefits. This study is done to observe the effect of nigella sativa Linn (black cumin) on blood lipids in hypercholesterolemic rabbits in the Department of Pharmacology, Gauhati Medical College, Guwahati, Assam. Rabbits are randomly selected and divided into 3 groups - group-A, B and C. Group-A is given standard diet, Group-B is given atherogenic diet, Group-C is given atherogenic diet and nigella sativa extract. Atherogenic diet is prepared by adding 2% cholesterol and 3% coconut oil to standard diet and average amount of diet given per rabbit per day is 100gm. Blood samples are collected from marginal ear vein and lipid parameters are estimated by kit method at weekly intervals for 6 weeks. Lipid parameters are not changes in group-A but group-B shows a significant increase except HDL. Group-C shows no change in blood lipid parameters except triglycerides (TG) at 1st week of study. In the rest weeks of study Group-C shows reducing effect on lipid parameters. It is concluded in our study that nigella sativa has hypocholesterolemia as well as reducing effect on triglycerides, HDL and LDL.

PG - 24  THE EFFECT OF FENUGREEK (TRIGONELLA FOENUM GRAECUM) SEEDS ON THE BLOOD GLUCOSE LEVEL IN RABBITS.

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Fenugreek (Trigonella foenum graecum) seeds a plant of leguminous family have been known for many years to exert anti diabetic activity. In this study the effects of ethanol extract of the Fenugreek (Trigonella foenum graecum) seeds was seen on the blood glucose level of alloxan treated diabetic rabbits. Rabbits were randomly selected (Average Wt. 1.5 kg) and were divided into 3 groups. Group-A was given standard diet, Group-B was made diabetic with Alloxan, aqueous solution of alloxan was injected intravenously, at a dose of 80mg/kg body weight. And Group-C Fenugreek was given in alloxan induced diabetic rabbits. Blood samples obtains from marginal vein of the ear, and blood glucose estimated at 1 hour interval for four hours, on the first day and subsequently at 7 days interval for 4 weeks. Group-A shows no change in blood glucose level but group-B shows a significant increase. Group-C shows significant lowering effect of Trigonella foenum graecum in blood glucose level. The findings of the present investigation clearly indicate that the seeds of Trigonella foenum graecum possess potential anti diabetic activity.

PG - 25  COMPARATIVE STUDY OF SERUM ZINC LEVEL IN MATERNAL AND UMBILICAL CORD BLOOD AND PREGNANCY OUTCOME.

Dr. Kakoli Oas

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This study is conducted in our region (greater Guwahati area) where estimation of maternal as well
Estimations were made under very stringent conditions in atomic absorption spectrophotometer. A total of 100 serum zinc estimations were made in singleton uncomplicated pregnancy. A large number of studies are being done where zinc is said to have a direct relation with fetal maturity, intellectual development, etc.

**PG - 26 EFFECT OF EXCOGENOUS GASTRIC INHIBITORY POLYPEPTIDE ON INSULIN SENSITIVITY IN FIRST-DEGREE RELATIVES OF TYPE II DIABETIC PATIENTS.**

Waghamare LS, Kaore SB, Mishra VP, Mishra NV, Barokar JR

Exogenous Human Synthetic Gastric Inhibitory Polypeptide (GIP) was infused intravenously to a total of 21 first degree relatives of patients with type 2 diabetes, 10 patients of type 2 diabetes and 10 healthy control subjects. With GIP, patients with type 2 diabetes responded with a lower increment in insulin (p = 0.0003) and C-peptide concentrations (p < 0.0001) than control subjects. The GIP effects in first degree relatives were diminished compared with controls but significantly higher in patients with type 2 diabetes (p 0.05). The responses over the time course were below the 95% CI derives from control subjects in 7 (insulin) and 11 (C-peptide) of 21 first degree relatives. In conclusion, a reduced insulinotropic activity of GIP is typical for a substantial subgroup of normoglycemic first degree relatives of patients with type 2 diabetes, pointing to an early, possibly genetic defect.

Keywords: Gastric Inhibitory Polypeptide, Insulin Sensitivity, First Degree Relatives, Type 2 Diabetes.
It is a fact that a larger volume of food stimulates the myenteric nerve plexus in the gastric wall and stimulates gastric emptying, i.e., larger the volume, faster the emptying.

I carried out a simple study on 20 healthy individuals divided into two groups, where after overnight fasting, gastric juice was aspirated by Endoscopy under direct vision in all the individuals. The gastric volume was studied after feeding them with varying volume of food, and repeating Endoscopy and aspiration of gastric contents and measuring the volume at regular intervals.