Activation of glutamate receptors of NMDA subtype results in the influx of calcium which has many physiological functions as well as pathological implications. Modulations of glutamate neurotransmission have been implicated in several neurodegenerative disorders such as Alzheimer’s disease, ALS, Stroke, Epilepsy, Huntington disease etc. Nitric oxide synthase

Destruction of the medial preoptic area (mPOA) neurons of rat brain, induced by intracerebral injection of N-Methyl D-aspartic acid (NMDA), has been studied by employing the non-invasive Magnetic Resonance Imaging (MRI) technique. Changes in the MRI images are compared and correlated with the functional changes after the mPOA lesion. The Progress of the lesion at the injected site has been monitored (using MRI) from 15 min to one month after the stereotaxic microinfusion of NMDA (5 μg in 0.2 μl). This study shows that the localised hyperintense (bright) area starts appearing at the mPOA from 3 h after NMDA injection, and the brightness increases progressively for about 2 days. The size and brightness of the hyperintense area decrease thereafter. It has not been possible to locate the lesion site after three days, using MRI, except in one rat where a vacuole like area was seen at the NMDA injected site on postmortem histological examination.

The reduction in sleep after the mPOA lesion does not show any correlation with the changes in MRI, as it persists throughout the three weeks of recording. On the other hand, the initial drastic reduction in male sex behaviour and the increase in body temperature correlated to some extent with the increased brightness in MRI, at the site of lesion. The size and location of the hyperintense area, observed during the first two days, match with the lesioned area which was histologically identified after one month of NMDA administration. Control administration of normal saline into the mPOA did not produce any alteration in the brightness of the MRI image and practically no loss of neurons at the injected site. Though some functional changes have correlation with the alteration in MRI, this cannot be used to interpret the changes in all the physiological parameters. This study also demonstrates that the disappearance of the brightness in MRI should not be taken to indicate a positive prognosis. Though the lesion could not be seen in MRI within two hours, its detection after 3-4h (but within 3 days) after NMDA lesion would give very valuable information for long term studies.
CME: 03  RECEPTOR CONCEPT : VIS A VIS MECHANISM OF DRUG ACTION

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Drugs produce their action either in a non specific manner by altering a physicochemical property such as absorption, osmosis, surface tension, a simple chemical reaction, etc. or in a specific manner by interacting with specific receptors. Receptors are macro molecules present in the cell membrane, cytoplasm or the nucleus with which the drugs interact to produce their action. The last few years have witnessed significant advances in the identification and characterisation of receptors, secondary messengers and G proteins which form an important link between the receptor and the secondary messengers. Receptors have also undergone classification and sub classification which have helped in the development of specific agonists and antagonists. We are also now in a better position to appreciate the homeostasis and regulation of receptors. All these recent advances have gone a long way in understanding the molecular basis of drug action.

CME: 04  "NOREPINEPHRINE AS A CENTRAL NEUROTRANSMITTER" CONCERNED WITH CONTROL OF BLOOD PRESSURE

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Our study suggested the presence of opposing mechanisms in the hypothalamus i.e., pressor or depressor receptors controlling B.P. Both chemical and electrical stimulation before and after respective blockers provided evidence that the posterior and lateral hypothalamus contained alpha adrenoceptors resulting in a pressor response while anterior and dorsomedial hypothalamus contained both alpha and beta adrenoceptors producing a depressor response. Thus the response to intraventricular (ICV) Injection of norepinephrine (NE) may ultimately depend on the balance between the pressor and depressor areas in the CNS controlling B.P. and can explain the variable effects as observed by several workers. The effects of ICV injection of NE were not constant, there being either an elevation or a fall in B.P. Moreover
All the above measures aim at reduction of DBP by an average of 10 mm of Hg. and thus help several million mild hypertensives.

i. Control of over weight.

ii. Reduction of salt.

iii. Increased intake of potassium containing foods sufficiently.

iv. Stop/reduction in alcohol consumption

v. Stopping smoking or tobacco consumption in any form.

vi. Behavioural therapy - including a) Yoga b) Meditation and c) Biofeedback.

All the above measures aim at reduction of DBP by an average of 10 mm of Hg. and thus help several million mild hypertensives.
Antihypertensive drugs in mild hypertension may produce many side effects and thus make asymptomatic hypertensives into symptomatic ones. Several studies have shown that in 60% of the mild hypertension does not progress, in 20% the pressure tends to fall and in the remaining 20% the pressure progresses to higher grades of hypertension. It is therefore desirable that a person with mild hypertension should be observed on the time honoured hygienic measures such as diet, weight control, regular physical exercise and mental relaxation for longer periods.

About 30 centuries back (1000 B.C.) Ayurveda (Science of Life) texts of ancient Indian system of medicine described the role of mind and self control under promotive and preventive health care - RASAYANA. Thus "One can never attain the fruits of Rasayana if he has not undergone grossly the process of elimination of his physical as well as mental impurities. The formulations meant for providing longevity, alleviating senility and diseases, succeed only in patients having purified mind and body and controlled self" - CHARAKA - (1000 B.C.)

The ancient Indian physicians laid down basic principles in the maintenance of normal (positive) health and pronounced certain preventive measures against the cardiac diseases.

They laid stress on:
1. ACHAAR : Normal conduct
2. AHAAR : Diet
3. VYAVAHAAR : Business
4. VYAYAAM - Physical exercise
5. YOGA:

Charaka particularly mentioned to shun anxiety, tension, emotional stress, hatred and competitive haste to keep fit against cardiac ailments. Several centuries before, William Harvey described circulation and Heberden described angina pectoris. Charaka had forewarned thus -

"Therapeutics is of two types - (i) that which promotes strength in the healthy (Rasayana) and (ii) that which alleviates disorders (curative)" - (Charaka Samhita).

Thus the primary approach to health care in Ayurveda was the preventive one and then came the role of drugs etc.

Hypertension is not a disease. It is a risk factor like high cholesterol or high uric acid or blood sugar. An attempt is made to show that non-pharmacological methods are very effective in resetting the abnormal pressure system in the majority of mild to moderate hypertensives, who have an abnormal coping problem. Basic care is concerned with the sleep, arousal, breathing pattern, rest, effort and self esteem.
OR: 01: METABOLIC ADAPTATION IN CHRONIC UNDERNUTRITION

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It is universally assumed that the physiological and metabolic responses of the human body to chronic undernutrition are similar to and can be explained on the basis of changes that occur during acute energy restriction. A reduction in oxygen consumption of the active tissues of the body seen during energy restriction has been considered as being indicative of enhanced cellular metabolic efficiency and as a sign of the existence of metabolic adaptation. These changes have been attributed to alterations in the activity of the three key thermogenic hormones: insulin, catecholamines and thyroid hormone metabolism in response to complete or partial energy restriction in human subjects. The reduced activity of these hormones along with the associated shift in substrate utilisation have been shown to be contributing to the likely increase in cellular metabolic efficiency.

It has been assumed that similar phenomenon occurs in chronic undernutrition in adults and may contribute to a beneficial, metabolic adaptive response. Careful investigations have, however, failed to demonstrate a reduced oxygen consumption of the active tissue mass of undernourished adults, hitherto considered to be a definitive index of cellular metabolic efficiency. It is likely that many of the changes demonstrated are the result of marked body composition changes that accompany the chronically undernourished state. Physiological responses in the other components of total energy expenditure such as thermogenesis and energy cost of physical activity do not seem to confer any energy saving or enhanced efficiency. Hence it is highly unlikely that metabolic adaptation occurs in chronic undernutrition. The inability to demonstrate metabolic adaptation in the chronically undernourished state in the adult is not surprising since more of these responses are likely to confer significant benefit to the individual.

OR: 02 PHARMACOEPIDEMIOLOGY OF ADVERSE DRUG REACTION MONITORING IN NATIONAL CONTEXT

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Until the recognition of chloramphenicol induced aplastic anemia and thalidomide-associated phocomelia, adverse drug reaction (ADR) monitoring was almost entirely anecdotal. These incidences led many countries to set up agencies to collect and evaluate information on spontaneously reported ADR's. This system, mainly intended to produce signals about potential new ADR's, has inherent disadvantages as all reactions are not reported and that the proportion which is reported in any specific situation is hard to estimate. Further under-reporting which may not be random but selective may introduce serious bias.

To overcome these, short intensive hospital based cohort studies were aimed with the objectives: a) To obtain details of acute adverse events attributable to drugs and to determine whether particular subgroups of patients are at greater risk than others, b) To
obtain information on the frequency of certain major life-threatening events and c) To identify association between prehospital drug use and disease or ADR causing hospital admissions. Some specific type of studies in this broad context such as Drug Oriented and Disease Oriented ADR Monitoring Programmes do provide specific information.

In most developed countries, there are elaborate ADR monitoring systems for collecting, analysing and feeding back the data to health professionals so that they take adequate preventive and remedial measures. ADR’s may be influenced by a large number of socio-economic, genetic, environmental, nutritional and ethnic factors. In India, these elements might induce a pattern of adverse effects quite diverse from those seen in other countries and it is unfortunate that we are entirely dependent on ADR data generated abroad. Problem in India is compounded by more than 8000 pharmaceutical houses and over 65000 formulations of which a very large proportion are irrational.

The rapid detection of ADR’s has far reaching public health implication. It is estimated that acute adverse effects occur in nearly 5% of patients while most of these are mild and reversible (nausea, rashes, drowsiness), a significant number are serious and represent a potentially preventable source of morbidity and mortality. In addition ADR need to be detected, validated and reported, so that clinicians can base a decision to a drug on known risks and benefits.

Prior to marketing, new drugs are subjected to preclinical animal studies followed by three phases of clinical trials. However, premarketing trials are limited in their ability to identify drug effects. These limitations include (I) less than 3000 participants, so rare drug effects can not be reliably detected (incidence less than 1 per 10000) (II) limited duration-long term effects can not be detected (III) Study population is not representative as children, elderly, pregnant women and those with associated other ailments than for which the drug is intended are excluded.

ICMR collaborative study was initiated in 1989 at six centres in the country including Delhi (2 centres), Meerut, Jhansi, Vellore and Aligarh as the coordinating centre. A report on nearly 58000 patients was submitted in 1993. Incidence reported was 5.81% with antimicrobials; 32.21% with antiamoebics, 3.147% with drugs used for cardiovascular diseases; 8.01% with bronchodilators; 4.65% with drugs for GIT; 3.9% with hypnotics and sedatives; 21.34% with anticonvulsants; and 14.64% with NSAIDs to name a few.

Encouraged by the successful completion of this multicentric project, ICMR established a task force in 1994 with functional centres at Jammu, Delhi, Bhopal, Baroda, Bombay, Hyderabad, Madras, Thiruvananthpuram, Vellore, Bangalore and Aligarh as the coordinating centre. This multicentric cohort study Task Force is observing International norms outlined by WHO. Common computer Compatible proforma and coded drug, disease, signs, symptoms, and investigation lists are being used. ADR monitoring on a National scale, would bridge a major gap in our public health programme, including health education.
Wound-healing, a complex process, has coagulation, inflammation, cell-migration, proliferation, cell-products and co-ordinated organization of these, as participating substrates. This complexity makes healing susceptible to drug-action and prompts pharmacologist to have tryst.

Advent of growth factors and an amazing finding of scarless-healing of fetal wounds have generated interest in "wound pharmacology" (Ann. Surg. 1992).

The present author and his colleagues have, over last two decades investigated wound-drug interaction from different angles. A comprehensive review of their findings forms the core of this presentation.

1) Of the herbal-remedies evaluated, only Tridax procumbens and Aloe vera demonstrated global pro-healing activity, prompting clinical trial.

2) Postsurgical use of NSAIDS can cause weak scars by suppressing collagen metabolism and maturation.

3) Denovo developed Zn-NSAID complexes promote wound healing, possess greater antiinflammatory and anaigesic actions with nil ulcerogenicity.

4) Anti-cancer agents globally suppress healing and co-administration of vitamin A prevents this.

5) Heparin & Warfarin promote epithelialization. Heparin but not warfarin suppresses wound strength. Pro-coagulants promote healing. Peri-surgical use of these agents merit review.

6) Histamine promotes healing probably via H1 receptors because H1-blockers but not H2 blockers suppress healing.

Hopefully, the presentation prompts critical comments, suggestions and entry of more workers into this promising research area.

Research is a serious and determined bid to answer questions. Experimental research is only one type of research. The reasons which motivate an individual to conduct research cover a wide spectrum ranging from gratification of curiosity to making a living. Society supports research efforts primarily because knowledge generated by research frequently
leads to improvement in the quality of life. In developing countries, research acquires special significance because of its favourable influence on the quality of teaching and on the scientific temper of the society.

According to Peter Medawar, research needs first, a mind prepared to grasp the truth, and second, a powerful imagination to perceive what truth might be like. Time is the most precious resource for a research worker. Inspiring leadership and a congenial atmosphere are much more critical for stimulating research than physical facilities.

Systematic research generally goes through a sequence of steps. The generation of a feasible and worthwhile idea is followed by the formulation of the problem and preparation of a formal project. The performance of the actual study leads to observations which have to be analysed for drawing valid conclusions. The conclusions are finally written up for publication. One study generates ideas for several more; thus the process is virtually endless.

PL: 03 PHOSPHOINOSITIDE DERIVED SECOND MESSENGERS AND CALCIUM HOMEOSTASIS IN NEURODEGENERATION.

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Phosphoinositide (PI) metabolism in cell membranes has been recognized as a source of several second messenger systems within neurons in response to a variety of hormones and neurotransmitters. Agonist activation of cell surface receptors causes the breakdown of membrane bound phosphatidylinositol bisphosphate (PIP$_2$) to diacylglycerol (DAG) and inositol 1,4,5-trisphosphate (IP$_3$) via the intervention of a specific G protein or G proteins. The IP$_3$ so released into the cytosol is instrumental in releasing calcium from intracellular stores via specific receptor sites on endoplasmic reticulum, and may also have a role in maintaining basal calcium levels. The calcium so released regulates many intracellular functions such as the activation of calcium/calmodulin-dependent protein kinases and translocation of protein kinase C(PKC) from the cytosol to the cell membrane where it is activated by the other arm of the messenger system, DAG.PKC is involved in the phosphorylation of several regulatory proteins. Further complexity occurs, since IP$_3$ can be either sequentially dephosphorylated to inositol, which serves as a fresh source for membrane PIP$_2$, or further phosphorylated to inositol 1,3,4,5-tetrakisphosphate (IP$_4$), which is known to facilitate calcium entry across plasma membrane. Abnormalities in the PI second messenger system can be the potential basis of cellular degeneration given the importance of this dual system on many intracellular functions.

The cerebellum is particularly enriched in the PI second messenger system. Therefore, we have examined this system in disorders associated with cerebellar degeneration such as in human dominantly inherited ataxia of the olivopontocerebellar atrophy(OPCA) type, as well as in a mouse model, the Lurcher. The data obtained clearly demonstrated that PI pathway is a potential mechanism for cerebellar degeneration.
AP: 01  SELF-STIMULATION REWARDING EXPERIENCE INDUCED ALTERATIONS IN DENDRITIC SPINE DENSITY IN CA3 HIPPOCAMPAL AND LAYER V MOTOR CORtical PYRAMIDAL NEURONS.

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Electrical self-stimulation (SS) rewarding experience results in an increase in the dendritic spine density in CA3 hippocampal and layer V motor cortical pyramidal neurons in adult male Wistar rats. SS experience was provided one hour daily over a period of 10 days through stereotaxically implanted bipolar stainless steel electrodes, bilaterally in lateral hypothalamus and substantia nigra-ventral tegmental area. After 10 days, rats were sacrificed and a total of 144 CA3 and 144 layer V motor cortical Golgi stained pyramidal neurons were examined. Dendritic spine densities were quantified in five successive segments of 15.2 mm length upto a total distance of 76 mm. Apical dendrites were classified as main shaft, sub branch, oblique shaft 1, oblique shaft 2, primary branch and basal dendrites as main shaft, primary branch and secondary branch. A grand total of 864 CA3 and 1008 layer V motor cortical pyramidal neuronal dendrites were analysed for spine counting. SS experienced group revealed a significant (ANOVA, F-test) increase (P < 0.001) in the numerical density of spines in all different categories belonging to both apical and basal dendrites in hippocampus and motor cortex. Such changes were not observed either in sham control, experimenter administered or normal control groups of rats. Our results demonstrate that the self-stimulation rewarding experience induces post-synaptic plasticity in hippocampal and motor cortical pyramidal neurons.

AP: 02  NEUROIMMUNOMODULATION - AN EXPERIMENTAL APPROACH.

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Nervous system can modulate the immune functions which has been termed as "Neuroimmunomodulation". This concept was experimentally analysed in Wistar strain male albino rats, prior/5th day after administration of T dependent antigen (Sheep red Blood Cells) intraperitoneal in physically & psychologically stressed rats (noise stress and cold water swimming stress) and stimulation (implanted bilateral electrode at dorso lateral hippocampus) and lesioning the discrete brain regions (Ventromedial hypotalamus, amygdaloid complex (AMGC), Ventral hippocampal formation (VHF) and dorsolateral hippocampus (DLH) by stereotoxic electrolytic lesioning techniques. 1. Neuroimmunomodulation of non-specific immunity is influenced by many CNS areas whereas the modulation of specific immunity by fewer distinct regions. 2. The architecture of lymphoid organs is maintained by AMGC under normal conditions and by hippocampus during an immune challenge. 3. Hippocampal regions (DLH & VHF) modulate the cell mediated immunity, humoral immunity and soluble
immune complex levels. (4) Regional specificity is also seen in neuroimmunomodulation. (5) Even the sham effect depends on the brain area involved in the electrode tract during neurosurgical procedures. Hence the present study strongly recommends a site-specific sham group whenever electrophysiological procedures are adapted to study neuroimmunomodulation. (6) These studies confirm the presence of neuroimmunomodulation by limbic regions.

AP: 03: MEDIAL PREOPTIC ALPHA-2 ADRENOCEPTORS IN THE REGULATION OF SLEEP-WAKEFULNESS

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(Physiology and Behaviour Vol. 57, No. 1, PP. 171-175, 1995)

The medial preoptic area (mPOA) plays a vital role in the regulation of sleep-wakefulness (SW). Previous studies have indicated the involvement of noradrenergic terminals in the mPOA in the regulation of SW. But the type of receptors involved in this regulation needs further investigations.

The objective of this study was to find out the changes in SW produced by the application of alpha-2 agonist and antagonist in the mPOA. This study was conducted on adult male Wistar rats (225-275g) with chronically implanted EEG, EMG and EOG electrodes and bilateral guide cannula in the mPOA. Small quantities (0.2ul) of yohimbine (1ug), clonidine (2ug), 25% dimethyl sulfoxide (vehicle of yohimbine) and saline (vehicle of clonidine) were administered into the mPOA of four different groups of rats. Drugs were administered at the flow rate of 0.1ul/min using 32 G injector cannulae. Recordings of EEG, EMG and EOG and behavioural observation were taken for 90 min before and 180 min after injection of the drugs. The polygraphic recordings were split into epochs of 30 sec and scored. The data was divided into bins of 5 min for final statistical analysis.

Clonidine administration induced significant increase in quiet wakefulness compared to its own preinjection record and saline injection readings. Behavioural arousal induced by injection of this drug was accompanied by EEG synchronization. These rats had wide open eyes with dilated pupils. On the other hand, yohimbine produced a significant increase in sleep when compared with its own preinjection record and the vehicle (dimethyl sulfoxide) injection.

Clonidine injection into the mPOA, results in the activation of alpha-2 receptors at the presynaptic membrane, causing decreased release of endogenous NE. Yohimbine, an alpha-2 antagonist, which blocks the presynaptic receptors and facilitates the release of NE, induces sleep in freely moving rats. We hypothesize that the normal function of NE terminals at the mPOA, is induction of sleep.
The influence of central and peripheral dopamine on immune system either directly through its receptors on the effector cells of the immune system or through the endocrine network has recently been indicated. The role of immune system during growth and progression of malignant tumors have also been recognised. Therefore in the present investigation, the significance if any, between central and peripheral dopamine and malignant tumor growth which was further strengthened by enhanced tumor growth following specified damage of central dopaminergic system with 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine. The underline mechanisms demonstrated significant depression of functional activities of different immune effector cells and serum immunoglobulin levels in the striatal dopamine depleted mice. In the peripheral system of normal mice, specific dopamine uptake were observed only in cells of bone marrow, spleen and lymph nodes both in vivo and in vitro, indicating its possible influence on immune system and hematopoiesis which showed functional disruptions during malignant neoplastic growth. Interestingly specific binding of dopamine to tumor tissue was insignificant. Thus it may be suggested that dopamine as both central and peripheral neurotransmitter can influence tumor growth through the immune network. The present findings are of importance to understand the host tumor interactions at the level of neurotransmitters and in addition it may help to develop new therapeutic strategies in future to combat this dreadful disease by using specific dopamine receptor agonists and antagonists.

SYM: 01:01 TOXIC INSULT OF SPERMATOCITIC CELLS UNDER THE EXPOSURE OF INDUSTRIAL CHEMICALS.

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Various types of testicular tissue injury may be caused after treatment with industrial chemicals at specific dose and duration to the laboratory animals. The assessment of these effects is essential to predict the risk assessment for germinal cell injury. Therefore, the data from animal may be useful to predict the unforeseen human health hazards. An attempt has been made to elucidate wide ranging industrial chemicals which cause male germinal cell injury at different morphological and biochemical levels. The results will be highlighted with a narrow mechanistic approach by defining essential target cell sites and cytotoxic consequences for germinal cell impairment after the treatment with industrial chemicals to laboratory animals.
Lead exposure causes sperm tail abnormality and recorded high lead concentration in plasma. Lead affects male germinal cell at the level of resting spermatocyte, whereas mercury affects the process of steroidogenesis. The feeding of hexavalent chromium at doses of 40 and 60 mg/kg caused cellular impairment in rat testicular tissue over a period of 90 days.

The above data exhibited that the mechanisms of testicular cell injury and gamatogenic cellular response after chemical exposure are very much different from one chemical to other. The selective sensitivity of chemicals and its reaction to a particular gametogenic cell is not well understood. However, several experimental approaches and model systems may give an answer hypothetically for testicular injury under the exposure of chemicals.

**SYM:01 :02 EFFECT OF ENVIRONMENTAL STRESS ON PHYSIOLOGY OF SMALL RUMINANTS**

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Small ruminants (Sheep & Goat) have not only to survive but also have to produce under stressful conditions of arid and semi-arid regions. High ambient temperature, lack of feed and fodder, lack of drinking water, saline nature of underground water and high concentrations of certain toxic elements in drinking water, are some of the environmental constraints in these regions. Longterm studies indicated that these regions are not suitable for introducing exotic blood for bringing improvement in small ruminants production. Some of the heavy and high producing indigenous breeds of sheep and goats from other regions of the country, which are well adapted to the stressful environment of these regions, can be used to upgrade local animals. Reduction in numbers and replacement of low producing animals by high producing animals seem to be the logical solution for solving constraint of feed and fodder scarcity. Raising of sheep and goat together can partially solve this problem. Sheep & goat in pregnancy and early lactation require atleast 3 watering per week and in rest of the stages these animals can be reared on 2 watering per week throughout their life time. These animals can be raised on moderately saline underground water containing upto 4.0 g/1 of total soluble salts throughout their life without any apparent adverse effect on their productive processes. Both of these species can tolerate nitrate in drinking waters upto the concentration of 1.0 g/l. The fluoride tolerance of small ruminant in drinking water is also reasonably high (10 ppm to 20 ppm) in comparison to tolerance of man (2 ppm).
Introduction of the new generation fighter aircraft has brought in its wake problems induced by a new type of environment, the high sustained Gz (HSG) environment, in which the Cardio respiratory systems are maximally affected.

An adequately functioning cardiovascular reflex mechanism is needed to support circulation during HSG. But sometimes even an apparently normal aviator may suffer from a cardiovascular syncope suggesting his inability to cope with HSG stress. Such individuals need to be vigorously assessed for the integrity of their orthostatic tolerance. As a part of this investigation we have found that the human nystagmus generator area function is disturbed by orthostatic stress given by lower body suction pressure in normal humans and on the basis of this, we have proposed that in apparently normal subjects who have suffered cardiovascular syncopal attacks, there may be a distinctive pattern in the characteristics of LBSP induced nystagmus.

Respiratory muscles come into use during anti G straining manoeuvres (AGSMs) which have to be performed when subjected to HSG, in order to support the cardiovascular system. We have shown in the Laboratory that high respiratory flow rates are generated during AGSM, and that while using breathing equipment similar to that used in the aircraft, the flow rates reduce significantly. On the basis of these findings, we have proposed that respiratory muscle training may be necessary for fighter pilots if they are to do an effective AGSM during HSG.

The Biological clock of the mammals, the Suprachiasmatic nuclei (SCN), situated in the anterior part of the hypothalamus controls the day to day rhythms in most, if not all of the physiological, biochemical and behavioral parameters. However, the clock is important not only for the day to day activities but also for the prediction and preadaptation of the organism / individual. Our knowledge about this clock is still incomplete. The clock, though endogenous in nature can be entrained by the environmental time cues. Necessary photic input signals / information for the entrainment of the clock reaches it by way of two projections. These are the retinohypothalamic tract (RHT) and the geniculo hypothalamic tract (GHT). Though RHT is only essential for the circadian function of SCN, it is likely that both RHT and GHT could function together in the entrainment process. The SCN have two important functions namely internal generation of circadian rhythms and entrainment of these rhythms with time.
cues provided by the environmental Light Dark (LD) cycles. In addition to the most important zeitgeber in mammals namely the LD cycle other non-photic zeitgebers can also have entrainment properties. Chemical entrainment is one among them. Neurotransmitters form an integral part in the working of the clock and a large number of them have been identified in the clock as well as in its afferent and efferent projections. Lesion of this clock in experimental animals leads to abnormalities in circadian rhythms since the function of the clock is to integrate the various afferent inputs to have a unified integrated output. Knowledge about the working of this clock along with its manipulation has been of immense help in therapeutic field as well as in combating the complications of modern day travel-jet lag.

SYM : 02 : 01  
PLANNING OF MEDICAL EDUCATION  
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There is a growing concern over the efficiency, effectiveness and more importantly the relevance of education of health personnel. The ultimate purpose of medical education is to contribute towards the maintenance and improvement of the health of the population by facilitating training of health personnel and ensuring the relevance of the course to the health needs of the community. The medical colleges have the responsibility of: (1) Giving direction to the educational programme, (2) Facilitating educational planning and (3) Improving the evaluation of the programme. It is necessary that the medical colleges must frame the objectives for which the institute has been established. These must be based on the health needs of the community and the desired change in the behaviour of the learner. In most of the institutions, planning of medical education has been unfortunately equated to framing the time-table, covering the syllabus and conducting the examination. Medical education must be based on scientific planning. It involves defining the instructional objectives and devising appropriate evaluation methods based on the skills to be acquired by the student. The educational objectives have to be specified at three levels. 1) Primary - Institutional objectives (2) Intermediate - Departmental objectives and (3) Tertiary - Specific instructional objectives. However, it is to be kept in mind that these objectives must be learner oriented and not teacher oriented. It would be pertinent to recollect that one can learn without being taught, but one cannot teach without learning. Defining the objectives alone, without specifying the expected level of performance of the learner for certifying his/her competence at the end of the course will not achieve the desired behavioural change. Planning the educational programme is not the responsibility of the head of the institution/department alone, but rather should involve a continuous interaction between the learner, the teacher and the community. The teacher should act as an interface to satisfy the health needs of the community as well as the aspirations of the student. Another major issue which needs to be addressed is the enormous explosion of scientific knowledge. Medical Education, which started with only four disciplines has now got compartmentalised into over thirty specialities. The duration of the course, however has remained more or less the same, thereby imposing
a heavy burden on the learner. It is mandatory for every department to conduct regular meetings for the planning of the curriculum. Lesson planning should be based on specifying the learning objective, the course content and the methodology of instruction. Defining the educational objectives would go a long way in individualising the learning and enable the teacher to play the role of an inducer and facilitator.

**SYM : 02 : 02 PHYSIOLOGY AND PHARMACOLOGY AS PART OF AN INTEGRATED CURRICULUM**

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For the past two decades there has been a growing concern about the quality of doctors graduating from traditional Medical Colleges in India. The Government of India has from time to time appointed a large number of Committees to look into the process of medical education. Most of these reports conclude that in view of the information explosion, limitation of time, stereotyped teaching methodology, the graduates coming out of medical colleges do not possess the attributes of a good clinician who can meet the community needs. Teaching is done in a fragmented, discipline based manner while the real life situation demands a holistic approach. Many innovative schools in other parts of the world have implemented problem based learning (PBL). However, India has its own problems with regard to selection criteria, faculty development and it may not be possible to institute PBL in traditional schools. The key, therefore, lies in evolving an integrated approach, demolishing departmental barriers, making connections across disciplines and communicating to the students a holistic organ based programme. This would lead to contextual learning and its application to solve the problems of the community. The paper proposes to discuss the possibility of integration between pre and para clinical sciences in the backdrop of community needs.

**SYM : 02 : 03 SCOPE FOR RESEARCH IN CLINICAL PHYSIOLOGY**

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Recently it was reported in Journal of Association of Physicians of India that only 15% of what physicians do is based on hard data and the rest 85% is based on data which is questionable. This led us to examine the question as to how many physiologists pursue research in clinical physiology. To get answer, we scanned IJPP for a decade (1985-94). We classified all human studies (applied physiology) into 4 subgroups: normative (N), physiologic intervention/interaction (P), illness study/intervention (I) and methods to, study human function (M) using a well defined criteria. It was found that the articles in first half of decade were too less to be classified. In later half of decade (1990-94) out of 308 articles only 54 (17.53%)
belonged to applied physiology group. The distribution of 54 articles among subgroups was like this: N, 27 (8.76% of total 308); P, 10 (3.2%); I, 12 (3.8%) and M, 5 (1.6%) of articles, the largest contribution came from normative data collection (50%). Study of function during illness intervention constitute only 22%. Although these figures represent single journal, nevertheless the results suggest that less number of physiologists are engaged in research in clinical physiology. The two facts (from JAPI and IUPP) indicate a wide gap, that justifies the scope of clinical physiology. The scope of clinical physiology is definable on the basis of absolute/universal needs, local needs or it could be 'constraint limited'. Considering patient and time availability is not a problem for physiologists the research is limited by resource availability. Thus, under 'constraint limited' definition one can widen the scope by using simpler techniques, large number of patients, physiological tests, and interventions. For generating a problem one needs to be realistic, that is one should find out whether the problem (of investigation/intervention) is encountered by clinician or not. Solving such problems leads to a viable research continuum.


SYM: 02 : 04 THE PHYSIOLOGY TEACHERS IN FUTURE

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Preclinical sciences are the foundation of Medical Science. The failure of the former to draw talents for teaching and research is posing a problem for their smooth functioning. A survey on the status of the department of physiology in North Indian states of UP, MP, Himachal, Punjab, Rajasthan, Delhi and Jammu and Kashmir was conducted. Only 15 of the colleges responded. The data was analysed for this presentation. The data shows poor enrollment for MD programmes in these colleges. Some of the colleges have not produced a single MD in last 5 years. Thus physiology in the current classical form remains a poor choice for the medical graduates. The presentation discusses and asks (1) Who will teach physiology? The life scientist in the university or the clinician in the medical college or both in case of extinction of the teaching departments of classical physiology. In the event of nonavailability of trained manpower how should a medical college organize the teaching of physiology? (2) Will the deletion of a department of classical physiology (this does not mean integrative physiology itself) be beneficial or harmful for the medical education and pedagogy? (3). Should we alter the physiology training to make it clearly clinical so that medical graduates are attracted.
The interest in electromagnetic field effects on biological system has been to a large extent stimulated by the worker and public concerns and pressures regarding safety of proliferating technologies. The main effort has concentrated in two frequency ranges: power line frequencies (50 - 60 Hz), and radio frequencies (RF) including microwaves. Considerable progress has been made in understanding the interactions of RF fields with living systems. This has led to laying down of recommendations for limits of safe exposure levels in many developed countries. The part of the electromagnetic spectrum which is of greatest concern, is the microwaves (300 MHz - 300 GHz). The most useful action in medicine is the thermal effect of microwaves radiation with the intensity of 10 mw/cm² or more. It is preferred because microwave hyperthermia allows to control precisely the temperature of the radiated site in comparison with other ways of heating. This characteristic feature invites a detailed study of underlying biophysical mechanism of their action. Probably the whole body exposure expresses the entire spectrum of microwave effects on the sub cellular, cellular and organismal levels.

The ability to enhance bone healing using biophysical input such as non-invasive method of electromagnetic field application offers a potential for development of therapeutic devices for fracture healing, implant fixation, and osteoporosis. The hypothesis of the proposed research is that growth factors (GF) mediate the biophysical stimulation of bone formation and consequently the healing process. These are some but by no means an exhaustive list of beneficial uses of electromagnetic energy.

The late Nobel Laureate Werner Heisenberg stated "The Magnetic Energy is that elementary energy upon which depends the whole life of an organism". In his days the relationship between magnetic field and biological processes was regarded as a gray area. today it is widely believed that electromagnetic fields can affect biological systems, including man, although the evidence remains equivocal. It has been well established that even very small alterations in fields can affect chemical reactions, those that involve free radicals. Role of free radicals in the development of cardiac diseases is rapidly gaining interest. A study was conducted on the members of Xth Indian Antarctic Scientific Expedition in Antarctica where the geomagnetic fields are high. The results have clearly indicated significant correlation between ECG abnormalities in the form of rate, rhythm, conduction and ST segment and geomagnetic perturbations. The probable mechanism by which GMF interact with cardiac tissue is not understood but partial ischemia and reoxygenation by free radicals cannot be ruled out.
**SYM: 03: 03 BEHAVIOURAL PATTERN IN EMF EXPOSED RATS**

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Recent reports have revealed the direct athermal effects of microwave radiation mediated by activation of corticotropin releasing factor. It decreases the cholinergic activity in the hippocampus and frontal cortex. These effects are mediated by endogenous opioids. This neurochemical change is reflected in the nociceptive behaviour of the rats exposed to low level, amplitude modulated radiofrequency fields (73.5 MHz, 16 Hz modulating frequency, power density 1.33 Mw/cm², SAR 1.85 W / Kg) 2 hrs a day for forty five days. On the contrary exposure to extremely low frequency field (ELF 50 Hz, 30 KV, 3 hrs a day for 45 days), does not affect the nociceptive behaviour of the rats. The latency to lick hind paws and to flick tail in response to the thermal noxious stimulus were not statistically different in the two groups. The threshold current strength for elicitation of tail flick and vocalization after-discharge were altered in exposed rats. The threshold for tail flick increased from 0.09 ± 0.01 to 0.12 ± 0.04 mA whereas, that for vocalization after discharge was significantly (P < 0.05) decreased to 0.58 ± 0.23 from 0.86 ± 0.53 mA in exposed rats. However, the tonic pain induced by the chemical (5% formalin subcutaneously) initiated almost similar nociceptive behavioural repertoire as the control ones. Surprisingly, pain induced (foot shock) aggressive behavioural patterns were dissimilar in the experimental and control groups of rats. Their immediate response was directed towards the avoidance of the shocks, rather than engagement in fighting behaviour. However, the control group of rats engaged in actual fighting behaviour. The results suggests different neural mechanisms for microwaves and extremely low frequency field interaction with biological system.

**SYM: 03: 04 ELECTROMAGNETIC FIELD AND CIRCULATING SEX HORMONES IN RATS**

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Electromagnetic (EMF) field has been reported to be a potential health hazard, a chronic stressor and an environmental pollutant. It damages the gametes, increases foetal mortality rate, suppresses ovarian functions and retards physical growth. It has been reported that the reproductive functions of the mice, exposed to 25-500 cw/cm for 4 hours/day for 48 weeks, were affected. It decreased fecundity, litter size and induced premature menopause. Extremely low frequency (ELF 50/60 Hz) also has effects on neuroendocrine system. In rats, exposed to 0.002 - 0.1 Kv/m of 45 Hz for 40 days, alterations in plasma corticosteroid and pineal hormone concentration have been reported. A still greater field intensity of 100 Kv/m 50 Hz exposure in rats for only 6-12 days induced alterations in thyroid and adrenal ketosteroid metabolism in rats whereas exposure to 60Hz electric fields for 120 days, significantly reduced plasma testosterone levels.
We have investigated the relationship between EMF and mammalian endocrine system with special reference to sex hormones viz. circulatory testosterone levels in male and oestradiol and progesterone levels in female rats. Chronic exposure (23 hr/day for 30 days to female and 60 days to male rats) of extremely low frequency (50 Hz) was applied to these rats. There was no difference in the levels of oestradiol and progesterone in control and treated female groups of rats whereas a significant decrease in testosterone levels was observed in treated group. The study suggests a specific effect of ELF on circulating levels of testosterone.

**SYM : 03 : 05 ELECTROMAGNETIC FIELDS AND CANCER**

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EMFs are ecological factors produced by telecommunication devices as well as by domestic appliances. They are environmental pollutants encountered daily which affect almost all organs of the body and thus pose to be a health hazard. We have studied the effects of extremely low frequency (ELF) and microwaves (MW) on a spectrum of biological responses affecting the metabolism of the body in male Wistar rats with respect to some organs such as liver, kidneys, testis, brain, spleen and thymocytes. Insight into the mechanism responsible for the interaction of ELF and MW with these biological systems were studied. Long term exposure to MW led to an epigenetic mechanism of modulation of gene expression by poly ADP-ribosylation, more so in liver and testis. However, long term exposure to ELF led to decrease in poly ADP-ribosylation in liver, kidneys and testis whereas, brain splenocytes and thymocytes showed an increase. Cooperativity appeared to play an important role in this phenomenon. Morphological characteristics of cell death by apoptosis was seen in thymocytes and splenocytes of ELF exposed animals.

**SYM : 03 : 06 EMF EXPOSURE AND IMMUNOLOGICAL STATUS**

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With the introduction of more and more sophisticated electromagnetic equipments day by day, the quality of life has definitely improved no doubt but has become a matter of concern due to the possible risk of emanating Electromagnetic radiation thus causing electro pollution of the environment. Such equipments include the VDTs, microwave ovens, police radars, electrical blankets and even the high power transmission lines. All these electromagnetic sources emit or emanate electromagnetic signals at varying frequencies of the electromagnetic spectrum. The spectrum extends from the lowest - Extremely Low Frequency (ELF) fields of 30-300 Hz frequency to the highest frequency of the gamma rays 10^{20} hertz. Recently a great deal of concern and research interest has been generated regarding
possibility of risk by exposure to extremely low frequency fields especially around 50-60 Hz following research reports of cases of leukaemia after public exposure to these fields. ELF Fields are generated in the vicinity of high power distribution networks, public transportation systems, electrical appliances like Motors, Electrical beds, Blankets etc. With the popularity of Computers and Videos which generate ELF and VLF fields, public concern arose regarding deleterious effects of VDTs. The electromagnetic pollution of the environment is entirely man-made through usage of sophisticated equipments like long distance telephone equipment, earth to satellite television broadcast systems, medical diathermy devices, police & military radar, air traffic control systems, and the above mentioned sources. Though the quality of life has definitely improved after introduction of these equipments, they have been added to the already existing list of environmental pollutants.

PD : 01  
HORMONE REPLACEMENT THERAPY IN WOMEN AT MENOPAUSE  
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Hormones are natural secretions of endocrine glands and exert important functional effects upon target tissues. Whenever an endogenous endocrine secretion becomes deficient due to any cause and is to be replaced exogenously for smooth functioning of target tissues, it is called as Hormone Replacement Therapy (HRT). One of the naturally occurring conditions is menopause, where the secretion of oestrogen by the ovary declines resulting in hypoestrogenic state. This results in vasomotor symptoms, atrophic changes, osteoporosis and increased incidence of cardiovascular disorders. Most women tolerate menopause well.

In order to improve the quality of life HRT is gaining more popularity. About 25 percent of women really feel miserable and require HRT. The extreme mood fluctuations, of vigour and initiative and loss of bone matrix are slowed considerably with HRT.

Though the solution (HRT) appears to be simple, it is not without hazards. Lowest possible dose for shortest possible time should be the goal.

Indefinite systemic replacement in all patients is certainly not necessary.

Women should be motivated and counselled to adopt active life style with a positive attitude. Age-old myths of menopause should be replaced with better understanding of this phase of life.
Anthropometric measurements are accepted criteria for assessment of Nutritional status of individuals. Triceps skin folds thickness (T, Skf.) is a measure of body fat and mid-arm circumference (MAC) an indicator of muscle mass and somatic proteins. Haemoglobin content of blood is a good chemical criterion for evaluation of nutritional status. In present study T. Skf. and MAC were measured by skin fold calipers and Hb estimated by Cyanmethaemoglobin method on spectrophotometer in 57 young females (18-25 years). On statistical analysis a moderate degree of correlation (r=0.28) was observed between Hb and T. Skf. From regression analysis it was evident that Hb is one of the factors influencing T. Skf. and its value can be predicted if T. Skf. Is known. There is a need to extend study in more number of subjects and in anaemic individuals to test the validity of T. Skf. In predicting haemoglobin levels.

In this study, the pulmonary functions of young swimmers of K.D. Singh Babu Stadium, Lucknow, India were studied. The parameters included in the study were height, weight, age, sex, chest expansion, breath holding time, FVC, FEV1, PEFR, FEFR and MVV. The objective of this study was to assess that swimming could be a good exercise to strengthen lung functions.

Two readings of the above parameters were recorded. The first reading was taken when the swimmers were out of practice for about one year. The second reading was taken just before the selections of the National team. At this time their practice was at its peak.

The readings indicate that, even when they were out of practice, the swimmers have higher values of pulmonary function tests and lung expansion, compared to the normal values. The difference was statistically significant. The readings taken, at the peak practicing time were also found to be significantly higher than the values obtained when they were out of practice. From the results obtained, it can be concluded that swimming can prove to be a good exercise for improving lung functions.
SELF-STIMULATION REWARDING EXPERIENCE INDUCED ALTERATIONS IN THE LEVELS OF GLUTAMATE, GABA AND ACHE ACTIVITY IN HIPPOCAMPUS AND MOTOR CORTEX.

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The Glutamatergic and Cholinergic neurotransmission have been implicated to play a role in a variety of important behavioral functions including learning and memory, and locomotor activity. Accordingly, the present study was carried out to identify the effect of electrical self-stimulation (which involves learning, memory and motor activity) on the levels of Glutamate, GABA and the activity of acetylcholine esterase (ACHE) in hippocampus and motor cortex in adult male Wistar rats. Self-Stimulation (SS) experience was provided daily for one hour over a period of 10 days through stereotaxically implanted bipolar stainless steel electrodes, bilaterally in lateral hypothalamus (LH) and substantia nigra-Ventral tegmental area (SN-VTA). At the end of 10 days, rats were sacrificed, Glutamate and GABA levels were estimated chromatographically and ACHE activity was measured spectrophotometrically in hippocampus and motor cortex. Results revealed a significant increase in Glutamate (ANOVA, F-test) in SS experienced rats in hippocampus (43%, F=17.28, P<0.001) and in motor cortex (37%, F=8.92, P<0.005) compared to normal control (NC) group of rats. GABA levels were not significantly altered in both the regions. The activity of ACHE were found significantly increased in hippocampus by 64% (F=16.29, P<0.001) and in motor cortex by 48% (F=13.52, P<0.001) in SS group. Such changes were not observed either in Sham Control or Experiment administered electrical stimulation group compared to SS or NC group of rats. The results indicate that self-stimulation of LH and SN-VTA increases the glutamatergic and cholinergic transmission in the hippocampus and motor cortex.

EFFECTS OF SHORT-TERM CIGARETTE SMOKING ON AUTONOMIC FUNCTION TESTS

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Cigarette smoking has been widely hypothesized to be associated with the dysfunction of the autonomic nervous system. Hence effects of smoking on the autonomic nervous system may be of interest in understanding possible deleterious effects of cigarette smoking on the cardio-vascular system. Five standard cardio-vascular autonomic function tests were conducted on healthy male cigarette smokers of age group 20-30 years, and also on age and sex matched controls for comparison. There is high incidence of cardio-vascular autonomic (parasympathetic) dysfunction even in cigarette smokers of relatively short-duration of 1-5 years. It was found that smoking a cigarette accentuates the already existing autonomic (Parasympathetic) dysfunction. However tests for sympathetic system were normal in smokers. Decreased vagal cardiac control...
and blunted postural responses in smokers especially after smoking a cigarette could be attributable causes for an increase in the parasympathetic test abnormality.

Key words: autonomic function tests, cigarette smokers, acute effects of smoking, parasympathetic dysfunction.

PG:03  CHRONIC RESTRAINT STRESS CAUSES IMPAIRMENT OF SPATIAL MEMORY TASK IN RATS.
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Chronic stress produces adverse effects on the brain especially the hippocampus. It is well known that hippocampus plays a major role in mediating cognitive functions such as learning and memory. We have previously shown that CA3 pyramidal neurons of the hippocampus are vulnerable to chronic restraint stress. In the present study we have found that degenerative changes in the hippocampus are accompanied by spatial memory deficit in rats subjected to chronic stress. Male Wistar rats of 45 days old were restrained 6 hours/day for 21 days in a wire mesh restrainer. Following the stress period, control and stressed rats were tested in T-maze which involves left-right discrimination for the food reward, a spatial memory task.

Stressed animals committed more errors during learning (0.30 ± 0.46 Vs 2.60 ± 0.3 errors/session respectively in stressed and control rats, P < 0.001) indicating an impairment in learning. The memory retention test which was conducted 24 hours after the last learning session, also showed a significant deficit in the performance of T-maze task. (3.16 ± 1.7 Vs 1.33 ± 0.84 errors/session P < 0.01). The observed impairment in learning and memory retention may be due to atrophic changes in the dendritic arborization of the CA3 pyramidal neurons produced by restraint stress. Although there was an increase in the number of dendritic spines, this compensatory plastic change may not be sufficient to overcome this functional deficit. Preliminary studies to determine the neurochemical correlates of the memory deficit have been carried out.

PG:04  EFFECT OF VMH LESIONS ON THE INTERACTION OF OPERANT RESPONSES WITH A PRE-REWARD STIMULUS.
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The altered emotional response to sensory stimuli typically displayed by VMH lesioned animals has suggested a role for the VMH in affective reactions. However, most of the studies have stressed on the changes in reactivity in response to aversive stimuli. In order to assess the positive affective reactions in lesioned animals, interaction of positively reinforced operant responding with a prereward stimulus was examined. Experimental animals engaged in food-reinforced operant behaviour were presented with a cue light and buzzer (CS) for 30 seconds, which were followed by a 5 minute period during which bar presses were rewarded with...
sweetened milk in addition to the food-pellet. In control animals, the time since the last bar press to the one following the presentation of the CS was increased as compared to the time interval between the last two bar presses prior to the presentation of CS. Preliminary results from the VMH lesioned animals indicate a change in this trend.

PG : 05  SELECTIVE REDUCTION OF MONOAMINE OXIDASE ACTIVITY IN THE FRONTAL CORTEX INDUCED BY SUBORDINATION.

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We have previously shown that subordination stress of the worker in the 'worker-parasite paradigm' causes a reduction in the levels of 5-hydroxytryptamine (5-HT) and dopamine (DA) but not norepinephrine (NE), selectively in the frontal cortex. The activity of monoamine oxidase (MAO), the enzyme responsible for the degradation of 5-HT and DA, is considered to be a direct indicator of the metabolism of these neurotransmitters. Accordingly, the present study was carried out to compare and evaluate the effect of dominant-subordinate (D-S) relationship on the total MAO activity. The model of D-S relationship selected was a worker-parasite paradigm in adult male Wistar rats. The total MAO activity was measured based on a previously published method using kynurenine as the substrate. The brain regions selected were frontal cortex (FCx), entorhinal cortex (ECx), hippocampus (HIP), hypothalamus (HYP) and Striatum (STR). It was found that the MAO activity was significantly (F2, 15 = 24.38; p<0.001) reduced in the FCx of the subordinate (worker) as compared to that of the dominant (parasite) or the control animals. There were no significant alterations in the enzyme activity in other four brain regions. These results along with our previous finding of reduced 5-HT and DA in the FCx suggest that subordination stress reduces the neurotransmitter turnover of the serotonergic and dopaminergic neurons in the frontal cortex selectively.

PG : 06  MEMORY IMPAIRMENT AND DEGENERATION OF CA 1 PYRAMIDAL NEURONS OF HIPPOCAMPUS FOLLOWING SUBICULAR LESION

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The hippocampal formation (HF) plays a major role in learning and memory. Subiculum a part of HF which connects the archicortex to the neocortex by its efferent pathways and its lesion impairs the spatial memory in rats. In the present study, male Wistar rats of 30 days age were tested for acquisition and retention of operant conditioning behaviour before and after the bilateral ventral subicular lesions using stereotaxy either chemically (ibotenic acid) or electrolytically. The study involves two sets of experiments. In the first set, subiculum was lesioned prior to the operant learning and the acquisition of operant behaviour was studied. In second set, the rats were first trained to acquire operant behaviour, to assess the effect of lesion on the retention of the operant task. In addition, the cell densities were quantified in cresyl violet stained
sections at different subfields of hippocampus namely CA1, CA2, CA3 and CA4. The results revealed that the acquisition of pedal press operant behaviour was delayed significantly (P<0.01) in both type of lesioned rats compared to normal and Sham Control rats. However, the retention of learnt behaviour after lesioning was found unaltered. The cell density study revealed that the lesioning of subiculum resulted in a significant loss of CA1 pyramidal cells (P <0.001) while sparing the other subfields of hippocampus. The degeneration of CA1 cells might be due to the loss of target (subiculum), which in turn might cause behavioral deficits. Our results suggest that subiculum is involved in acquisition of operant task but not in retention.

PG: 07  CORRELATES OF INSULIN RESISTANCE IN NON INSULIN DEPENDENT DIABETICS

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Insulin resistance is a cardinal feature of NIDDM. In order to determine the degree and correlates of insulin resistance (IR) in NIDDM, we measured insulin sensitivity by the Hyperinsulinemic euglycemic clamp study (HECS) after physical examination and anthropometry in subjects with NIDDM (n=14), impaired glucose tolerance (IGT, n=4) and normal glucose tolerance (NGT, n = 17). HECS was performed at an insulin infusion rate of 40 mU/sq.m/min to achieve hyperinsulinemia of 100 uU/ml, the mean coefficient of variation (± SD) for blood glucose was 5.4± 0.65. The M value in NIDDM patients was 4.70 ± 2.95 mg/(kg.min) compared with 7.69 ± 4.3 mg / (Kg.min) in IGT and 9.52 ± 3.0 mg/ (kg.min) in NGT (p = 0.0009). Though the BMI of the three groups of subjects was not different (27.2 ± 4.5, 26.1 ± 0.9 and 24.7 ± 4.4 in NIDDM, IGT and NGT respectively, P = 0.27), patients with NIDDM and IGT had a higher waist hip ratio (0.98 ± 0.09 and 0.99 ± 0.04 respectively) than NGT (0.91 ± 0.07, p = 0.02). M value correlated negatively with BMI (r = 0.48, 95% CI = -0.7 to -0.17), SUBSCAPULAR : TRICEPS SKIN FOLD RATIO (r = 0.35, 95% CI = -0.61 to -0.02), waist circumference (r = -0.52, 95% CI = -0.73 to -0.23) and most significantly with waist hip ratio (r=-0.61, 95% CI = -0.78 to -0.34). Further, patients with a higher glycemic response to oral glucose load (area under 2h. OGT curve) had a higher IR as evidenced by a lesser M value (r = -0.51, 95% CI = -0.73 to -0.21). M values did not correlate with body surface area or total (triceps + subscapular) subcutaneous fat. This first report of HECS from India shows IR in NIDDM, and that IR correlated with markers of trunkal and generalized obesity.
GLIAL FIBRILLARY ACIDIC PROTEIN (GFAP) IS EXPRESSED IN RADIAL GLIA OF NEONATAL RAT SPINAL CORD FOLLOWING EXPOSURE TO CEREBROSPINAL FLUID FROM PATIENTS WITH AMYOTROPHIC LATERAL SCLEROSIS.

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Amyotrophic lateral sclerosis (ALS) is a progressive degenerative disorder involving the motor neurons in spinal cord, brain stem and cerebral cortex. Aberrant neurofilament phosphorylation has been observed in neonatal rat ventral horn spinal cord when exposed to cerebrospinal fluid (CSF) from patients with ALS. Hyperphosphorylation suggests an initial stage of degenerative changes occurring in ventral horn motor neurons. These studies proposed about the circulating toxic factor(s) in the ALS CSF. Any type of insult to CNS can also induce astrogliosis which is characterised by the extensive synthesis of intermediate filaments, comprised of GFAP. In the present study, CSF samples from the ALS patients were injected into the spinal subarachnoid space of four day old rat pups. After 48 hours, 30 micron sections of the spinal cord at lumbar level were stained for GFAP, the cytoskeletal protein in glial cells, using specific antibody. Positive staining for GFAP was observed in the radial glia in the ALS CSF exposed rats. The normal and the saline control rats showed negative staining for GFAP. The present study shows that the initial degenerative changes due to the putative circulating factor(s) in the ALS CSF is also characterised by the expression of GFAP in the radial glial cells in the neonatal rat spinal cord. GFAP is not normally expressed by the radial glial cells in the neonatal rats, hence the present finding provides a clear evidence for the pathological response of glia to the putative circulating toxic factor(s) in the CSF of ALS patients.

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RETINAL NEURAL NETWORKS INVITRO - CHARACTERISATION OF CELL TYPES AND DETERMINATION OF FUNCTIONAL CONNECTIVITY.

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A Neural network is an ensemble of neurons which are simple processing elements that function to perform a specific computation. Dissociated rat retinal neurons grown in cultures can be used as a biological model to understand information processing. Retinal cells were dissociated from zero day old pups and seeded at different densities to obtain neural networks ranging from a few neurons to several neurons. Initially aggregates of cells were seen in the culture, but later after 6-8 days individual neurons differentiated on the monolayer of glial cells. Cells with 2-3 processes dominate the network comprising of 80% of total neurons. A few neurons have four or more processes and about 10% of the neurons have a single process. The neuronal cell type characterisation was determined immunocytochemically using specific antibodies. Photoreceptors and bipolar cells were identified using the antibody against glutamate and...
morophological criteria, a group of amacrine cells by anti-GABA and retinal ganglion cells by anti-Thy1. The synaptic organisation invitro was studied by electron microscopy where gap junction like structures of varying sizes and chemical synapses with well defined presynaptic vesicles were observed. Functional studies on cultured neurons are carried out with intracellular electrophysiological techniques. The above study has enabled us to establish a biological model of neural networks which can be used for functional analysis.

**PG: 10**

**SPINAL CORD ISCHEMIA AND NEUROPROTECTION BY (-)DEPRENYL - A BEHAVIORAL AND MORPHOLOGICAL EVALUATION**

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Spinal Cord (SC) compression and ischemic damage leading to severe motor deficits are of high prevalence. Understanding the pathophysiology of SC injuries and treatment require animal models to correlate the trauma / ischemia related motor abnormalities and morphological changes in SC motor neurons. Accordingly, we have developed an animal model to study the effect of SC ischemia by occluding abdominal aorta just below the renal artery in unanesthetised adult male rats. The motor deficits in ischemized rats were assessed by a "staircase" maze. Quantitative and qualitative changes in spinal motor neurons were carried out in 20 alternative Cresyl violet stained sections (per animal) at mid lumbar level. In addition, the putative neuroprotective role of (-) deprenyl (MAO-B Inhibitor) in ischemic rats was studied at two different doses (0.1 and 1 mg/kg b.w.)

The results revealed a significant motor deficit in ischemized rats, has assessed by the performance in staircase maze test (ANOVA; F=43.72, P < 0.01). The motor neurons were in different phases of degeneration and there was a reduction in the number of motor neurons (43% $F = 3.48$ P < 0.025.) However, the ischemized rats, treated with (-) deprenyl did not show any motor impairment, and the motor neurons were healthy as observed in the case of control rats. The neurodegeneration in ischemized rats may be due to excitotoxicity, as ischemia induces excess glutamate release and formation of free radicals, while (-) deprenyl may bring neuroprotection by increasing the activity of antioxidant enzymes or glutathione.

**PG: 11**

**INFLUENCE OF ACE INHIBITORS ON WOUND HEALING IN ALBINO RATS.**

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Bradykinin (BK), an inflammmogen, is known to proliferate fibroblasts, stimulate angiogenesis and release histamine. As ACE inhibitors are known to increase the activity of Bradykinin by inhibiting its breakdown, they could be expected to enhance the above actions of BK and there by promote wound healing.
The present study was undertaken to investigate whether commonly used ACE inhibitors have any effect on wound healing since there is paucity of such information. Captopril (CPL) and Enalapril (EPL) in their clinical equivalent doses have been investigated in three wound models viz. excision, resutured incision and dead space wounds. Drugs were administered once daily orally till completion of study.

In excision wound (Mortan & Malone 1972) study percentage closure at different time intervals, scar features, time required for complete epithelization were monitored. In resutured incision wound (Erlich & Hunt) study tensile strength was measured on 10th day. Granulation tissue obtained from dead space wounds (modified D'Arcy technique) on 10th day were monitored for their dry weight, histology and hydroxyproline content.

In excision wounds both CPL and EPL significantly (P<0.01) enhanced wound closure at all intervals of observation. The time for complete epithelization was 17.33 ± 0.2 days for CPL, 17.5 ± 0.22 for EPL in contrast with 19.83 ± 0.4 days in controls. Scar area on complete epithelization was significantly (P < 0.001) less in both the treated groups.

Wound breaking strength 288.33 ± 10.53 gms in CPL, 282.50 ± 9.97 gms in EPL were significantly (P < 0.001) more than 203.33 ± 8.13 of controls. Granuloma dry weight was 63.28 ± 2.63 mg % in CPL, 60.52 ± 2.27 mg% in EPL and 43.33 ± 1.59 mg % in control indicating significant (P < 0.001) increase in treated groups. Similarly hydroxyproline content was significantly increased in both the treated groups (1.47 mg/gm in CPL and 1.37 mg/gm in EPL in contrast to 0.95 mg/gm of control). These observations were supported by histological findings. Granuloma breaking strength was also significantly (P < 0.001) increased in CPL (434.166 ± 11.64 gms) and EPL (422.5 ± 8.33 gm) as compared to controls (328.166 ± 9.26 gm).

Both captopril and enalapril enhanced healing of all the three types of wounds.

PG: 12 MEDIAL PREOPTIC ADRENERGIC RECEPTORS IN THE REGULATION OF BODY TEMPERATURE

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Several evidences confirm the role of norepinephrine (NE) system at the medial preoptic area (mPOA) in the regulation of body temperature (Tb). The type of adrenergic receptors involved in this regulation is not clear as all types of adrenergic agonists produce dose dependent hypothermia, when administered intracerebrally at or near the mPOA. In this study an attempt was made to find out the type and location of NE receptors in the mPOA involved in altering the Tb. In order to achieve this objective, the changes in Tb produced by alpha-2 agonist and its antagonist, when administered at the mPOA were studied in normal and ventral noradrenergic bundle (VNA) lesioned rats.

Thirty six adult male Wistar rats were trained to accept rectal probe. All experiments were conducted in the thermoneutral zone (26 ± 1°C). Alpha-2 agonist clonidine (2 ug), its antagonist
yohimbine (1 ug) and their vehicles (saline and 25% dimethyl sulfoxide) were injected at the mPOA in four different groups of rats. Two other groups of rats received clonidine and yohimbine at the mPOA after destruction of the NE fibres. 6-hydroxydopamine (8ug/1ul) was bilaterally injected at the VNA to destroy the NE fibres projecting to the mPOA.

The administration of vehicles did not produce any change in Tb. Administration of low dose of clonidine (2ug), in normal rats, also did not produce any change in Tb, whereas it produced hypothermia in VNA lesioned rats. There was no significant change in Tb after application of yohimbine in both normal and the VNA lesioned rats.

The results indicate that the alpha-2 receptors, which are primarily situated in the presynaptic terminals, do not play a role in the temperature regulation as administration of alpha-2 agonist and antagonist produced no change in Tb. On the other hand, hypothermia induced by clonidine in the VNA lesioned rats (in which presynaptic terminals are destroyed) would have resulted from a direct action of this drug on the postsynaptic hypersensitive alpha-1 receptors. So it could be concluded that the postsynaptic alpha-1 receptors are sites of action of adrenergic agents.

EFFECT OF CYCLOSPORINE - A ON XENOTRANSPLANTATION OF MONKEY PANCREATIC ISLETS TO RAT

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The objectives of the study is to see the effect of cyclosporine-A on the xenographic transplantation of monkey pancreatic islets into rats. The islets were isolated from monkey pancreas by the collagenase digestion method. Dextran density gradient was used to separate the islets from the acinar tissue and they were hand picked. These isletstook up the Dithizone stain indicating that they are alive. About 1000 islets freshly handpicked were transplanted under the left renal capsule of rats. Cyclosporine-A (30mg/kg / i.m.) was given daily into the treated rats. The control rats did not get cyclosporine injection. The rats were sacrificed after 3, 4, 7 and 14 days after transplantation. The monkey islets with the rat kidney were removed and processed for light microscopic study. Then the grafts were examined histologically in both cyclosporine treated and untreated control rats. In the control rats the islets were disintegrated and infiltrated with lymphocytes. But in the cyclosporine treated rats the islets were intact maintaining their structural integrity. It is concluded that monkey islets can survive in rats under cyclosporine cover.
PULMONARY CHANGES DUE TO THE EXPOSURE OF IRON ORE DUST AS EVALUATED BY LUNG FUNCTION TESTS AND SOME BLOOD PARAMETERS.

Ramesh Bhat
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Forty steel foundry workers and forty controls belonging to comparable age groups, sex, body surface area and Socio-economic status were subjected to lung function tests. Their Absolute eosinophil count and serum estimation of Alpha 1 - Antitrypsin and Alpha 1 - Antichymotrypsin were done. Only non-smokers were selected to avoid the effect of smoking on lungs. According to the duration of exposure the steel foundry workers were grouped into Upto 10 Years (16) and Above 10 Years (24) Groups.

FEV₁ showed a highly significant decrease even within 10 years of exposure whereas FVC and PEFR/Min showed decrease only after 10 years of exposure indicating that obstructive changes appear earlier than restrictive changes. This may be due to allergic hypersensitivity leading to bronchospasm as evidenced by a highly significant increase in Absolute eosinophil count.

Even though highly significant reduction in Alpha 1 - Antitrypsin and Alpha 1 - Antichymotrypsin was seen within 10 years of exposure, indicating uninhibited elastolytic activity, remarkable restrictive changes were only seen after 10 years of exposure which may cause permanent lung diseases like emphysema if not controlled.

PEAK EXPIRATORY FLOW RATE IN ATHLETES AND NON-ATHLETES

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147 male and 137 female athletes of the age group between 17 to 22 years were selected to find peak flow rate with the help of a mini peak flow meter. 126 males and 142 females of the same age group who were not involved in any athletic activity were chosen as a control group. After a thorough Medical examination, the test was demonstrated and explained and three readings were taken and maximum finding was chosen.

It was observed that peak flow rate is significantly high in both male and female athletes inspite of significantly high age and less height. Peak flow rate in athlete male was 575 (± 96.30) L/min & in females 443.78 (± 75.65) L/min. In control group it was 454.52 (± 67.68) L/min in males & 344.54 (± 56.08) L/min. Weight did not affect the results. In both groups the PEFR was found within normal limits according to Indian standards. It was less according to western standards.

Regular exercise increases the strength & elasticity of the respiratory muscles. It enhances the blood supply to the lungs & respiratory muscles & opens dormant alveoli. All these changes increase the peak expiratory flow rate. The test is useful to identify exercise induced asthma.

30
F: IA: 03  PULMONARY FUNCTION AND EXERCISE TOLERANCE FOLLOWING CESSATION OF SMOKING

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A total of 50 subjects, who had history of smoking 20 or more cigarettes daily for over 10 years were studied after they had stopped smoking for 1-4 years.

Forced vital capacity (FVC) and Forced expiratory volume at one second (FEV₁) and Exercise tolerance test were performed at least one week apart on each of these subjects, while they were still smoking. After cessation of smoking, ventilatory pulmonary function tests and exercise tolerance test were repeated twice a year for four years and results were compared before and after cessation of smoking.

There was improvement in FVC, FEV₁ and exercise tolerance in 94.9% of subjects studied after they ceased smoking. Significant improvement was noted in FVC, FEV₁ in the first two years after cessation of smoking. Exercise tolerance continued to improve up to four years. The mean improvement in FVC was 15.1%, and FEV1 8.5%. Mean exercise tolerance test improved by two minutes at four years.

F: IA: 04  DYNAMIC VENTILATORY FUNCTION TESTS IN RICE MILL WORKERS

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Dynamic Ventilatory function tests were performed on one hundred male subjects working in rice mills, by using computerised electronic dry spirometer (MED-SPIROM). The results showed that 18% rice mill workers had obstructive type of ventilatory disorders, whereas only 4% rice mill workers had restrictive type of ventilatory defects. This could be attributed to allergic or inflammatory reactions of broncho-pulmonary tissues and probable cause could be rice mill dust endotoxin. Majority of workers having obstructive type of ventilatory disorders had small airway obstructive defects, whereas only few have large airway obstructive disorders.

F: IA: 05  A STUDY OF OXIDANT LEVELS IN BRONCHIAL ASTHMA PATIENTS

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Reactive species of oxygen have been implicated in the pathogenesis of number of lung disorders. The production of oxidants also plays a central role in the tissue damage associated with activated inflammatory cells. The actual physiopathogenesis of respiratory airway obstructive diseases is still not very clearly known. The aim of present study was to find out the influence of free radicals in Bronchial Asthma patients. The patients were selected from out door of K. C. Hospital of K. G. M. C. Lucknow. The pulmonary function tests of these patients were also performed to assess the level of asthma. Total 25 patients were studied.
The level of lipid peroxidase enzyme, which gives indirect level of free radicals was measured. The results show statistically significant high level of lipid peroxidase enzyme. It has been suggested that these free radicals cause rapid decrease in ciliary activities which could play a role in pathogenesis of airway diseases. Thus by investigating the level of free radicals the prophylaxis and management of asthma can be influenced.

F : 1A : 06 A STUDY OF EFFECT OF BREATHING EXERCISES AND SWIMMING ON LUNG FUNCTIONS IN SOME PATIENTS OF PULMONARY TUBERCULOSIS

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The present study was undertaken to know whether breathing exercises and swimming add some beneficial effect on the lung functions in the patients of tuberculosis along with antitubercular treatment (ATT) or not. In this study, 20 patients of pleural effusion, cause Koch's Pathology, were selected from Kasturba Chest Hospital, K. G. Medical College, Lucknow. These patients were trained for different breathing exercises like breath holding, purse lip breathing, pranayama. Eight of them were also advised to do swimming daily. These exercises were started after about 2 months of beginning ATT and getting response and continued till the full course of ATT (6-8 months). The control group comprised 10 patients of pleural effusion who were kept only on ATT. The pulmonary functions were recorded with the help of MEDSPIROR at two months interval in both groups. The result indicates that there is serial and statistically more significant improvement in lung functions in patients who did breathing exercises in comparison to the control group. The increase was more pronounced in those who did swimming too. So, we can conclude that if breathing exercises and swimming are advised along with ATT to the patients of pulmonary tuberculosis, there will be early and complete recovery of lung functions.

F : 1A : 07 ASSESSMENT OF PULMONARY FUNCTION IN HANDLOOM WORKERS

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Although cotton fibre related obstructive airway disease - Byssinosis - has been known to medical science for centuries, detailed analysis about the pathogenesis, progress and morbidity has been undertaken over the last few decades only. The present study was performed to ascertain the prevalence of obstructive airway disease related to cotton textile fibres in handloom workers of Belgaum and its suburbs. The pulmonary function parameters viz. F.V.C., FEV1 and PEFR were measured, in 30 textile workers and 30 age-matched healthy subjects, using computerised electronic dry spirometer (MED-SPIROR). While the textile workers had significant reduction in all the spirometric norms compared with the control group, the reduction in FEV1 and PEFR were considerably greater than the reduction observed in FVC. The results indicate that exposure to air pollutants is a major causative factor in the development of obstructive airway disease. In view of the influence of cotton fibres on pulmonary function,
efforts should be made to minimize the incidence, progression and morbidity of respiratory impairment. Rescheduling of the working hours and deployment of the personnel in different sections of the textile industry may help in reducing the concentration of cotton fibres to which the textile workers are exposed as well as shorten the duration of exposure. Upgrading the working environment by provision of adequate ventilation and use of protective masks may further improve the working efficiency.

**F: IA: 08**  
**IMPROVED CARDIOVASCULAR AND RESPIRATORY FUNCTIONS AFTER SHORT TERM PREKSHA MEDITATION EXERCISE.**  
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Nine healthy male subjects were incorporated in a group experimental study to evaluate the positive effects of Preksha Meditation. Heart rate and Breath rate were recorded at the onset and after two weeks of regular exercise (2 sessions of 45 min. each) of Preksha Meditation (Perception of breathing - Deergha Shwasa Preksha). These parameters were taken before, during and after the meditation. Breath rate decreased significantly along with similar decrease in heart rate, both during and after exercise. These results indicate a much relaxed state of heart and nervous system. It is presumed that long term exercise of Preksha Meditation will bring about improved and long lasting beneficial effects on cardiovascular and respiratory functions.

**F: IA: 09**  
**CAN AN ASANA BE CONFUSED WITH AN EXERCISE**  
**K. J. Thaker**  
Freedom Fighter, Prakruti Mandir, Borsad

An asana being distinctly different from an exercise in its objectives / targets, performance characteristics and end effects, need not at all be confused with the latter though sometimes, Asanas are to be performed vigorously and quickly with no rest periods feeling of comfort, forced breathing and transitory postures as in exercises. Kalimanthan Nauli, Uddiyan bandh are examples of Asan poses along with no ease of performance, fast actions and heavily taxed breath. This group can improve the of performance excretory track of digestion. Kapal bhati and kumbhaka with similar features are useful for cleansing respiratory track can be called vigorous exercises.

The circulation of Prana Shakti and actions of Panch Vayus the concepts based on specific effects / properties on the body and mind make it highly essential that the two terms Asana and exercise are neither mixed up nor confused.
ALTERATIONS IN SENSORY INFORMATION PROCESSING DURING KUNDALINI (CHAKRA) MEDITATION

B.L. Metli, S. Venkatesh, Ramachandra, T. R. Raju and *Yogini Shivani, *George Tomkins

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Computer averaged human auditory evoked potential (AEP), LED simulated visual evoked potentials (VEP) and somato-sensory medial nerve evoked potentials (SEP) have been elicited during meditation as well as control sessions in senior chakra meditators. The session data was analyzed in epochs of 5 minutes duration. Each session consists of 5 minutes eyes open and eyes closed states before as well as after 20 minutes of either meditation or control period. During meditation or control two epochs of evoked responses were generated.

A preliminary analysis of the data revealed a decrease in N40 middle latency AEP during the second epoch of meditation session when compared to the epoch of control session, while other peak latencies were found to be unaltered. On VEP, surfacing of P100 were observed during the meditative states. In the SEPs no significant change has been observed. The possible neurophysiological mechanisms underlying the above change might be increase in the speed of the processing of the sensory signal at cortico-cortical areas for the auditory stimuli.

Efficacy of Naturopathy and Yoga in Bronchial Asthma
A Self-Controlled Matched Scientific Study


Dept of Physiology, St John’s Medical College, Bangalore - 34

Asthma is one of the common psychosomatic illnesses influenced by factor of allergy. Bronchodilators give temporary relief and have side effects. The present study is aimed at studying the efficacy of a non-pharmacological approach of naturopathy & yoga in bronchial asthma.

A total of 25 patients (14 male & 11 female) with mean age 28.2 yrs (male), 34.6 yrs (female) admitted to INYS, Bangalore during the year of 1993-94 for the period of 21 days were studied.

The treatment included (1) Dietary therapy in three phases (eliminative, soothing and constructive), (2) Nature cure treatments including general (enema, steam, sauna etc.) and specific treatments (hot foot and arm bath, back massage, fomentation and chest pack, asthma bath) (3) Yoga therapy including kriyas, pranayama, asanas and Yoganiidra. Various parameters including lung function tests were measured on admission and once a week. Results showed significant improvement in PEFR, VC, FVC, FEV1, FEV/FVC%, MVV, FEV 25-75% Frequency distribution of subjective and objective scores was also significant. Patients reported a feeling of well being, freshness and comfortable breathing. Naturopathy and yoga helps inducing positive health, alleviating the symptoms of the disease by acting at physical and mental levels.
25 patients with chronic rheumatic mitral stenosis, during their stay in the hospital were investigated to find out changes in pulmonary function in mitral stenosis. 10 normal subjects served as control.

All cases were subjected to assessment of pulmonary function tests like vital capacity, FEV₁, % FEV₁, and peak expiratory flow rate. The lung volumes were measured by conventional water sealed spirometer and PEFR by Wright’s peak flow meter.

The data were reviewed and it was found out that, there was significant decrease in vital capacity, FEV₁, & PEFR.

Our result might be due to increased pulmonary pressure or pulmonary congestion which are important complications of mitral stenosis.

Among the haemostatic factors, calcium and platelets play a major role in the pathogenesis of AMI. Moreover, calcium also has a vital role in the excitation-contraction coupling.

The present study was undertaken to find out the variations in the serum calcium and blood platelet count in AMI, which was conducted in 20 male patients of ICCU between the age group of 40-65 years.

The serum Calcium was estimated by o-cresolphthalein in complexone method. The platelet count was done by using Coulter counter model T-540.

It was observed that the serum calcium shows slight decrease after myocardial ischemia. But platelet count remain at the borderline before thrombolytic therapy (Streptokinase and Aspirin were used) and increase in count after the therapy, although both the values remain within the physiological limits.

The author is of the opinion that the decrease in calcium may be attributed to the thrombus formation and intracellular accumulation of calcium secondary to ischemia. The variation in the platelet count before and after therapy may be attributed to anti-aggregability property of aspirin.
CARIDIOVASCULAR EFFECTS OF ABANA AN Ayurvedic Preparation and Its In-Vitro Platelet Function.


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Abana is an ayurvedic preparation compounded from 47 ingredients obtained from plant and animal sources. It was studied to evaluate its effects on Cardiovascular haemodynamics and platelet function on six volunteers. H.R., B.P., E.C.G. were recorded before drug (2 tab BD X 9 days) and immediately after exercise. Blood was drawn to study platelet adhesiveness, clot retraction, PF-3 availability and platelet aggregation in response to ADP, epinephrine and collagen. No change was observed in the resting HR or BP. Platelet function was found to be inhibited with a reduction in Peak aggregation to each of the three agonists used. PF-3 availability was also reduced (P<0.01). It is concluded that treatment with Abana has an inhibitory effect on platelet aggregation and PF-3 availability without affecting platelet adhesiveness or clot retraction. Our findings do not support the contention of an inhibitory effect of Abana on Cardiovascular haemodynamics after nine days treatment.

DETREMINAL EFFECT OF HYPOTHERMIA, DURING ACUTE NORMOVOLAEMIC HAEMODILUTION

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Haemodynamic responses to hypothermia were studied at normal haematocrit (HCT) and following induction of acute normovolaemic haemodilution. Experiments were performed on 20 cats anaesthetized with a mixture of chloralose and urethane in two groups. In one group (n=10) effects of hypothermia on various haemodynamic variables were studied at normal HCT (HCT-41.0 ± 1.0%) and in second group (n = 10) effects of hypothermia on various haemodynamic variables were studied after induction of acute normovolaemic haemodilution (HCT 14.0 ± 1.0%). Left ventricular pressure (LVP), left ventricular contractility (LVdP/dt max), arterial blood pressure (ABP), heart rate (HR), right atrial pressure (RAP) were recorded on a polygraph. Cardiac output was measured by thermodilution technique using a cardiac output computer. In both the groups of animals, hypothermia was induced by surface cooling with ice. Cardiovascular variables were recorded at each 1°C fall in body temperature. Hypothermia produced significant (P < 0.05) fall in HR, CO, ABP and LVdP/dt max in both the groups. However, percent fall in HR, CO, ABP and LVdP/dt max in response to hypothermia was significantly (P < 0.05) higher in cats with low HCT as compared to cats having normal HCT. Severity of hypothermia induced cardiovascular effects in cats with low HCT is also evident from frequent arrhythmias and drastic fall in HR, ABP and LVdP/dt max indicating higher risk of circulatory disorders on exposure to low temperatures in anaemic conditions.
PULSE WAVE VELOCITY AND LIPID PROFILE IN VARICOSE VEIN PATIENTS

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Pulse wave velocity (PWV) of the femoral - dorsalis pedis artery of the lower limbs of twenty varicose vein patients, aged 25 to 45 years suffering for more than two years, were taken and compared with twenty age matched normal subjects. Blood pressure and fasting serum total cholesterol level, triglyceride, high density lipoprotein (HDL), low density lipoprotein (LDL), very low density lipoprotein (VLDL) were also estimated from these subjects. PWV showed a significant increase ($P < 0.001$) in varicose vein patients as compared to control subjects. There was no significant difference either in the blood pressure or lipid profile. It appears that neither hypertension nor atherosclerosis is responsible for the increase in PWV in varicosties. It may be suggested on the basis of the present study that arteries are also involved in the pathogenesis of varicose veins. The involvement of the arterial tree in the pathogenesis of varicose veins, if given due consideration, may add new dimension to the understanding of many ill defined facets of this disease.

EFFECT OF MICROCLIMATIC COOLING SYSTEM ON HEAT INDUCED PHYSIOLOGICAL STRAIN

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Prolonged exposure to high temperatures in places like boiler and engine rooms of naval ships, tank crew compartment and in certain industries leads to physical discomfort and loss of working efficiency. The feasibility of providing conditioned (cooled) air during heat exposure on reducing physiological strain using an assembly of vortex tube-air ventilated suit has been examined. The miniature vortex tube when supplied with compressed air gives out two streams of air, cold and hot. The cold air generated is distributed over the body through air ventilated garments consisted of an outer semipermeable overcoat, an inner ventilated jacket and an air ventilated mask and jacket. Six subjects were exposed to simulated hot and humid environment ($T_{db}$ - 50 $^\circ$C, $RH$-50% & wind velocity - 17 m/min). Subjects wore air ventilated suit immediately next to the skin. They underwent heat exposure for 1 hr wearing air ventilated garments in association with vortex tube on different days: In one of the exposures subjects were not provided with microclimatic cooling, while cool air at 15 $^\circ$C at 450 lpm were supplied to them during later half of the exposure. Heat strain indices such as heart rate, heat accumulation and sweat loss were measured. The results indicate a significant reduction in heart rate, heat accumulation and sweat loss on applying microclimatic cooling. Microclimatic cooling produced by vortex tube air ventilated suit can be very effective in reducing heat induced physiological strain.
EFFECTS OF SULPHURDIOXIDE AND CHLORINE ON PULMONARY FUNCTIONS.

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In modern industrialized world man is exposed to an increasing number of chemicals and physical irritants.

Sulphur dioxide presents one of the important air pollution problems in industry. It has been found that typical exposure levels during pollution episodes are near or below 1.43 mg/m$^3$. Chlorine is another air pollutant. Exposure to chlorine mainly occurs as a result of plant malfunction or through accidental release. The exposure limits for chlorine in air varies in different countries from 0.998 to 2.99 mg/m$^3$.

The study was conducted on 500 male workers of Jayshree Chemicals, age group of 20-60 years. The lung functions comprising of VC, FEV1, PVC, MVV & PEFR were recorded including haematological examinations. Measurement of the concentration of these gases in the factory was done at regular intervals by using the Dragers multigas detector model 21/31. A follow up study of the same workers was undertaken after one year and the results were compared with the initial observations.

In our observations the average concentrations of Sulphurdioxide measured in the factory was found to be 1.87 mg/m$^3$ and that of Chlorine 4.06 mg/m$^3$. Workers exposed to gases of such concentration showed significant reduction in pulmonary functions.

Reviewing the available informations on the biological effects of these gases and correlating with our observations it can be concluded that there is definite health risk associated with certain critical levels of these gases.

AGE RELATED VARIATIONS IN RETICULOCYTE RESPONSE IN SUMMER

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Determination of the Reticulocyte count in fifty medical students during the different months of the year for many successive years has shown a very characteristic increase in the reticulocyte count during the early summer months (March-June). In the present study the reticulocyte count was done in fifteen laboratory and teaching staff (mean age 36 years) in the same way. The mean reticulocyte counts were 0.65, 0.74, 1.01, 1.27, 1.18, 1.54 and 0.77 in December, January, February, March, April, May, June & July, respectively. In the medical students (mean age 18 years), the mean reticulocyte counts were 0.57, 0.69, 0.78, 1.18, 1.33 & 0.69 in the corresponding months in one session. Thus there was a significant increase in the reticulocyte count in summer in the present series also, but no significant age related variation was found, when compared to the (younger) medical students.
F:IIA:20 PHYSIOLOGICAL PROPERTIES OF RAT HIND LIMB MUSCLES AFTER 15 DAYS OF SIMULATED WEIGHTLESS ENVIRONMENT

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Weightlessness during space mission results in atrophic changes in those muscles which have maximum weight bearing function and consist primarily of slow twitch fibres. The present study was designed to evaluate the effects of 15 days of hindlimb unloading (HU) by tail suspension on (1) weight of gastrocnemius (G), plantaris (P), both predominantly having fast twitch fibres and soleus (S) muscle, predominantly with slow twitch fibres and (2) contractile properties viz. peak twitch tension (Pt) and peak tetanic tension (Po) of GPS muscle. HU rats showed significant weight reductions of G (-18.3%), P (-17.7%) and S (-42.2%) muscles, Pt and Po were also reduced in HU group but when these were expressed per gm of GPS muscle, no significant changes in Pt and Po were observed. These findings indicate that HU in rats results in maximum atrophic change in those muscles which have predominantly slow twitch fibres and reductions in contractile properties of muscles are in proportion to reduction in muscle weight. HU by tail suspension offers a good ground based model for developing the deconditioning of muscles as applicable to weightlessness of space and offers a scope for studying various counter meausres to prevent these.

F:IIA:21 ENTRAINMENT OF CIRCADIAN RHYTHMS OF HUMAN SUBJECTS IN ANTARCTIC WINTERS

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Perturbations of light, temperature, chemicals and feeding habits can bring about alterations in the state of entrainment of circadian rhythms (CR). Antarctica due to its geographic location has a unique cycle of light and darkness. This study was conducted to evaluate the CR entrainment on 4 male healthy members of XII Indian scientific expedition to Antarctica during their 14 months stay at "Maitri station". The records were obtained in Delhi, winter start, mid winter, end winter & during return. The acrophase of oral temperature (OT), heart rate (HR), systolic and diastolic blood pressure (SBP and DBP) were determined by 4 hourly recording. The OT & DBP exhibited significant acrophase delay during winter stay from 1728 to 1935 hrs and 1918 to 0226 hrs respectively. Whereas HR and SBP showed phase advance from 1932 to 1722 hrs and 2140 to 0004 hrs respectively. The mean 24 hr value of DBP and HR increased significantly (P < 0.01) during Antarctic winters while OT and SBP, did not alter. Our findings thus suggest that the light dark signals at antarctica is the cause for phase shifting of circadian rhythms, while the magnitude and direction of these phase shifts depends on input signals from non-photic cardio-vascular and metabolic events of the body.

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Motor nerve conduction velocities were determined in 25 patients, clinically diagnosed as Guillain-Barre Syndrome. The nerves include ulnar and median of the upper extremity and lateral popliteal and posterior tibial nerves of the lower extremity by using MDM 30 electromyograph. The study showed a significant decrease in motor nerve conduction velocities (MNCV) in one or more nerves. Some revealed conduction block as evidenced by complete absence of compound muscle action potentials (CMAP). The decrease in MNCV showed correlation between progress of the disease to it’s severity. It is interesting to observe decrease in the amplitude of CMAP well before the actual fall in MNCV and before any evidence of paralysis. Further the observations showed that the prognosis was better in patients who showed either decreased amplitude of CMAP or decreased MNCV than those with conduction block.

F: III A: 23 MOTOR NERVE CONDUCTION VELOCITIES IN HEALTH AND DIABETES MELLITUS

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Neuropathy is one of the most common complications of Diabetes mellitus. Often the diagnosis becomes difficult and subtle. Nerve conduction studies form an integral part of the assessment of Motor nerve function.

Motor nerve conduction velocities were determined in 60 normal healthy subjects and in 120 insulin dependent and in 120 non insulin dependent diabetic patients in two age groups viz. 15 to 30 and 31 to 50 years with and without clinical signs of neuropathy. The nerves chosen were ulnar and median of upper extremity and posterior tibial and lateral popliteal nerves of lower extremity.

The results of the study revealed a significant decrease in MNCV in all diabetic patients as compared to age matched controls. The decrease was significant even in the absence of any clinical signs of neuropathy. There was no significant deviation in reduction of MNCV between IDDM and NIDDM. Decrease in MNCV was more or less similar in both upper and lower extremities.

The study infers that clinical evidence of neuropathy is not a pre-requisite for reduction of MNCV in diabetics. Thus the determination of MNCV not only helps in early diagnosis of Neuropathy but is also useful in prognosis of the disease.
EFFECT OF PRENATAL AND POSTNATAL PCPA (P - CHLOROPHENYL ALANINE) ON LEARNING AND MEMORY IN ALBINO RATS

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Brain 5-HT is known to be involved in learning and memory. In the present experiment we studied the effect of depletion of 5-HT by injecting PCPA 150 mg/kg intraperitoneally. Albino rats were divided into three groups in which group I was saline injected control, whereas in Group II and Group III PCPA was injected at 40th to 42nd day of postnatal life and 11th to 13th day of prenatal life respectively. All the 3 groups were then tested for shuttle box avoidance conditioning which is an indicator of learning capacity. When results were analysed by 2-way ANOVA, the performance of Group II was significantly decreased (P < 0.001) when compared to Group I and when Group III was compared with Group I there was still more significant decrease (P < 0.0001). But when Group II was compared with Group III there was less significant decrease in performance (P < 0.05). Therefore, we conclude that depletion of 5-HT during prenatal life has much more deleterious effects than during postnatal life.

POSSIBLE ROLE OF GLUTATHIONE IN THE MAINTENANCE OF BLOOD - BRAIN BARRIER FUNCTION

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Glutathione (GSH) is known to play a variety of physiological roles in the biological system. The present investigation was carried out to understand the role of this tripeptide in the blood-brain barrier (BBB) function. The i.p. administration of GSH - depleting agents viz. diethylmaleate (1-4 mmol/kg) and phorone (1.8-2.7 mmol/kg) to male A rats was found to increase the BBB permeability of sodium fluorescein dye and decrease the concentration of brain GSH in dose dependent manner. The administration of certain sulfhydryl agents like N-acetyl cysteine, methionine and GSH did not produce any significant change in the BBB function of the control rats. However the treatment of GSH - depleted rats with N-acetyl cysteine and methionine was found to partially protect the BBB damage induced by the depletion. The i. v. injection of GSH completely normalized the BBB permeability in GSH-depleted rats with a partial recovery of microvessel GSH levels. It is suggested from the data that GSH plays an important role in the maintenance of BBB function and possible depletion of this tripeptide in the brain and microvessels under certain pathological conditions or following a xenobiotic exposure may lead to BBB dysfunction.
F: III A: 26: EFFECT OF IMMOBILIZATION STRESS ON LIPID PROFILE

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This is the well known fact that the cause of atherosclerosis is hypercholestraemia. In the present era of stress and strain, mental stress leads to hypercholestraemia.

In the present study it was tried to ascertain if stress due to forced immobilization will cause hypercholestraemia, any change in lipid profile and hemogram.

The study was conducted on six albino rabbits which were kept in ideal condition of L : D ratio (14:10) and fed with soaked bengal gram and water ad lib. Blood samples were taken from rabbits before stress and these were treated as control. Each rabbit was given 2 hrs. immobilization stress daily for one week. Blood samples of rabbits were taken out after 1 day, 3rd day and 7th day during the period of stress. Again blood samples were taken after 1 week and 10 days after relaxation. Blood was analysed for lipid profile, total differential WBC counts and absolute eosinophil count.

Results of the study showed that during stress there was significant decrease in serum cholesterol, serum triglycerides, total lipids and absolute eosinophil count, while value of HDL was significantly increased. But after relaxation of one week and 10 days, the blood samples showed reversal of above results.

F: III A: 27 THE EFFECT OF NMDA - AGONISTS AND ANTAGONISTS ON NOCICEPTION IN MIDBRAIN REGIONS

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Experiments were conducted on 11 rats who were treated with L - Aspartic Acid (10 ug) & (25ug) doses & MK-801 (10 ug doses) through stereotaxically implanted cannulae in the central grey region in chronic animals. All animals were allowed post-operative recovery for seven days. Pain thresholds were assessed by measuring the tail flick latency (TFL) with the hot water method. All animals served as their own controls and effect of drugs was seen by measuring TFL 30 minutes after the drug microinjection through cannulae inserted into PAG. At the end of the experiment animals were sacrificed and brain sections were stained with haematoxylin and eosin and the electrode tract identified. Results showed a hyperalgesic effect with l - aspartic acid in 25 ug dose, TFL (4.0 - 5.5 1.03 - 1.06) compared to control TFL values (9.1 - 9.5 secs ± 1.0 ± 1.22) P < 0.05 for mean area under curve. MK - 801 in 10 ug doses showed a TFL ranging from (1.8-4.1 secs ± 0.3 - 3.9) compared to control TFL (9.2-9. 6 secs ± 0.5 - 0.8) P < 0.05 for mean area under curve, producing a significant hyperalgesic response. (significance levels were calculated for mean area under curve using student’s t - test). These results indicate that the NMDA receptors play a role in the nociceptive mechanisms. It has been shown that glutamate activates NMDA channel which stays open for a long time. MK
801 has been shown to antagonize both the aversive & nociceptive responses in a dose-dependent fashion. Further dose related studies with NMDA agonists & antagonists are needed to understand their contribution to nociceptive mechanisms.

**F : III A : 28 : ROLE OF ENKEPHALINERGIC MECHANISMS IN THE LOCUS COERULEUS AND ADJOINING TEGMENTAL REGIONS IN THE MODULATION OF PREDATORY ATTACK RESPONSES ELICITED FROM LATERAL HYPOTHALAMUS**


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The present study was carried out in five cats which did not attack rats spontaneously. Predatory attack on an anaesthetized rat was produced by electrical stimulation of lateral hypothalamic area at a mean current strength of 300 to 660 uA. At 300 uA only components of affective display like alertness, pupillary dilation and flatness of ears were exhibited. Increase in the current strength led to the recruitment of other components like piloerection and salivation. A full-fledged predatory attack on an anaesthetized rat was exhibited at a mean current strength of 660 uA. A scoring system allowed the construction of stimulus response curves which remained fairly constant when repeated over a period of 3-4 weeks.

Bilateral microinjections of delta alanine methionine enkephaline (DAME) into locus coeruleus and adjoining tegmental regions in 500 ng dose in 0.5 ul saline significantly decreased the mean current strength required for the elicitation of hypothalaminically induced predatory attack. This facilitating effect of DAME persisted for 30 minutes. Microinjection of naloxone (1 ug in 0.5 ul saline), an opioid antagonist, into the same sites when the facilitatory effect of DAME was at its peak, reversed the response and the thresholds returned to control level within 10 minutes. Microinjection of naloxone (1ug) alone after DAME effect had waned off into the same regions completely blocked the predatory attack and there was significant increase in the threshold current strength for affective components while somatic components were completely inhibited. Control microinjection of normal saline in 0.5 ul volumes failed to produce any change.

The excitatory effects of DAME and inhibitory effects of naloxone were statistically significant at p<0.01 and p<0.05 using Wilcoxon’s signed rank test. The present study indicates that hypothalaminically induced predatory attack behaviour is facilitated by enkephalinergic mechanisms located in the locus coeruleus and adjoining tegmental regions.

**F : III A : 29 : EFFECT OF LESION OF CENTRAL NUCLEUS OF AMYGDALA AND BASOLATERAL NUCLEUS OF AMYGDALA ON FOOD INTAKE IN RAT.**

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Bilateral electrolytic lesion of central nucleus of amygdala (CEA) and Basolateral nucleus of amygdala (BLA) were performed in separate groups of rats (n=11 each), using...
stereotaxic methods in rat. Another group of rats (n=10) was used as sham lesioned controls (SL Control). The daily consumption of food was recorded for one week before the lesion (Pre lesion) and for 3 weeks post operatively (Post lesion). The food intake of the rats lesioned in CEA declined significantly during the post lesion period (p<0.01) In the post operative period, three distinctive phases were observed. First phase of aphagia; second phase of food wasting and the third phase of recovery of normal feeding. At the end of these three phases animals were still hypophagic. The third phase appeared to be permanent and extended beyond third week, whereas the former two phases lasted for about 5 - 7 days each. While the aphagic phase and food wasting phase could possibly involve some motor deficit concerned to the feeding activities, the hypophagia in the third phase suggested that the CEA might be excitatory to the feeding behaviour.

Lesion of BLA resulted in the increased food intake during the post lesion period (p<0.01) This indicated that this nucleus might exert inhibitory influence on the food intake. The integrated activity of these centres along with hypothalamic nuclei could ultimately determine the overall feeding behaviour in animals.

F : IIIA : 30 OPERANT RESPONDING ON RANDOM INTERVAL SCHEDULES UNDER GRADED FOOD-DEPRIVATION IN RATS.

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Food deprivation stimulates ingestive behaviour in animals. The aim of the present study was to find out whether feeding behaviour during the satiated state is controlled by affective signals. To this end, food-reinforced behaviour of rats under graded food deprivation was studied on random interval schedules (RI) in a Skinner box. The RI schedules were administered either as a simple or a multiple schedule. The simple RI schedule had only the random interval component while on the multiple schedule, a random time component alternated with the random interval schedule. Several rats were controlled for their body weight through graded food deprivation. The appropriate pattern of responding on the random interval schedule is to press the bar at high rates while on the random time schedule, the animal need not make any bar presses. In general, animals tended to exhibit much higher response rates on the random interval component of the multiple schedule than on the simple random interval schedule. The difference in the response rates is accounted for by competition of affective collateral behaviours with bar pressing during the simple RI schedule. In the multiple schedule, the competing behaviour is displaced to the RT component so that the response rate during RI component is increased. It was observed that in the satiated state, the difference in response rate between the simple and multiple schedules is increased; thus there is an enhancement in the control of food reinforced responding by affective stimuli.
F: IIIA :31 EFFECT OF AMYGDALAR LESION ON NOCICEPTION

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Amygdala forms an integral component of endogenous pain modulating system. Bilateral amygdalar lesion decreases the emotional nociceptive responses induced by electrical stimulation of the tail nociceptive fibres. Since various noxious stimuli initiate different responses which are mediated at different levels of neuraxis, we report the effect of bilateral amygdalar lesion on tonic and phasic pain. The withdrawal reflex of tail and hindpaw in response to thermal, the emotional nociceptive reactions in response to electrical, and the behavioural pain rating in response to chemical noxious stimuli were used to assess the magnitude of phasic and tonic pain respectively. Bilateral amygdalar lesions were made electrolytically (2mA for 15sec). The threshold strength of electrical stimulation for tail flick was not affected (from basal 0.095 ± 0.02 to 0.13 ± 0.04). The threshold strength for eliciting simple vocalization increased from 0.62 ± 0.3 to 1.4 ± 0.6 and that for vocalisation after discharge, it increased from 0.62 ± 0.3 to 1.4 ± 0.6 and 0.9 ± 0.3 to 1.7 ± 0.4. The tail flick latency to noxious heat stimulation was not affected (from basal 19.9 ± 3.5 to 19.5 ± 4.5). The latency to lick hindpaw after placing the rat on the hot plate increased from basal 13.8 ± 8.6 to 31.9 ± 11.6 post-lesion. The average nociceptive behavioural rating in the formalin test was not affected (1.9 ± 0.3 to 1.9 ± 0.04). The results indicate that bilateral amygdalar lesions produce hypoalgesia, as reflected by an increase in the threshold for eliciting vocalization after discharge, whereas tail flick threshold, latency and nociceptive rating in the formalin test remained unaffected. This confirms the role of amygdala in emotional component of pain.

F: IIIA :32 OSCILLATIONS IN BODY TEMPERATURE DURING SLEEP-WAKEFULNESS FOLLOWING DESTRUCTION OF THE PREOPTIC AREA NEURONS

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The medial preoptic area (mPOA) regulates sleep-wakefulness (S-W) and body temperature (Tb). Lesion of the mPOA in rats produces hyposomnia and inability to regulate the Tb. The Tb normally fluctuates in such a way that there is a fall during sleep and a rise during wakefulness. Induced changes in Tb can also alter S-W. The present study was undertaken to investigate the alterations in Tb with the S-W stages after lesion of the mPOA. In nine adult male wistar rats S-W were assessed on the basis of EEG, EOG, EMG recordings through chronically implanted electrodes. Tb was also recorded in these rats by using digital telethermometer. The mPOA was bilaterally lesioned in four rats, whereas in five it was lesioned unilaterally, using chemical neurotoxin, N-Methyl-D-Aspartic Acid. Changes in Tb during different stages of S-W were recorded before and after the mPOA lesion. The mPOA lesions produced an increase in wakefulness and suppression of all stages of sleep. Post lesion rise in mean Tb was observed during all stages of S-W, except in paradoxical sleep. However, Tb changes during S-W stages were not significantly different from the prelesion state. Since
the Tb alterations with S-W were maintained even after bilateral destruction of the mPOA, it can be concluded that the Tb changes, occurring along with S-W, are not actively regulated by an interlinking mechanism at the level of the mPOA.

F: III A: 33 TEMPORAL CHANGE IN THE NOCICEPTIVE PATTERN OF THE RATS FED WITH 20% SUCROSE SOLUTION SUPPLEMENTATION FOR 48 HOURS

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Short term (immediate) sucrose feeding has been reported to prolong tail-flick response to radiant heat in adults as well as in rat pups; long term sucrose feeding (1-6 days) produces hyperalgesia. The response to various noxious stimuli elicits different responses mediated by specific neural substrates. There are no reports available on the effects of acute sucrose feeding on responses to other noxious stimuli. This report is aimed to explore the effects of acute sucrose supplementation on the temporal change (6, 12 and 48 hours after) in the pattern of nociceptive behaviour with noxious electrical, thermal or chemical stimulations. The hind paw licking latency on the hot plate (52.5°C) did not alter significantly. On the contrary, tail flick latency (recorded on the analgesiometer) in response to noxious radiant heat increased significantly after sucrose intake (10.7 ± 1.66 to 14.37 ± 3.02 at 6 hrs and 8.08 ± 3.55 to 10.62 ± 1.12 secs at 12 hr respectively). However, it decreased significantly (P < 0.05) after 48 hrs, (12.39 ± 0.12 to 10.62 ± 1.12 secs). The threshold current strength for eliciting tail flick response decreased significantly (P < 0.05) after 12, 48 hrs (0.18 ± 0.08 at 12 hrs and 0.15 ± 0.04 at 48 hrs from the basal value of 0.29 ± 0.13 and 0.33 ± 0.11 mA). Simple vocalization (sv) was elicited at a statistically significant (P < 0.001) lower threshold after 12 hrs (0.53 ± 0.17 to 0.36 ± 0.10 mA). The pain behavioural rating (average) to chemically induced tonic pain decreased significantly (P < 0.05) after 12 hrs of sucrose feeding (1.89 ± 0.10 to 1.57 ± 0.20). The results suggest that the 12 hr of 20% sucrose supplementation leads to hypoalgesic nociceptive behavioural responses to thermal, chemical and noxious electrical stimulation of the tail.

F: III A: 34 \( P_{300} \) AS A ELECTROPHYSIOLOGICAL MARKER OF DEMENTIA

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Dementia is an acquired syndrome of persistent global decline in mentation. Numerous psychological test batteries are available to document it clinically but they have a limitation of being purely subjective and are not quantitative; the probability of adaptability is also there. \( P_{300} \) is an evoked potential occurring in response to a task relevant stimulus which is generated by cerebral cortex. The aim of this study was to observe changes in \( P_{300} \) potential in various types of dementia. 73 conscious & co-operative patients suffering from evident...
dementia of which 12 were alcoholic, 22 of multi-infarct state, 9 degenerative and 20 senile dementia were subjects, 10 healthy young volunteers were control. After a clinical documentation of dementia using standard tests, P300 was elicited on a Neuropack IV model using auditory tones with odd ball paradigm. There was significant change in P300 wave potential in the form of increased latency and poor reproducibility, in demented patients, as compared to control. Aetiology and duration of dementia had no correlation with the P300 wave. We presume that P300 can be used as a electrophysiological marker of dementia.

IV A: 35 EFFECT OF PRAZOSIN AN ALPHA - 1 ADRENERGIC BLOCKING AGENT ON DOPAMINERGICALLY MEDIATED BEHAVIOURS.
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Effect of Prazosin - an alpha -1 postsynaptic blocking agent, on some of dopaminergically mediated behaviours was investigated in albino rats by studying spontaneous motor activity (SMA), catalepsy and conditioned avoidance response (CAR). Prazosin hydrochloride (dissolved in distilled water) was injected intraperitoneally in doses of 1.25 mg, 2.5 mg, 5.0 mg and 10.0 mg/kg body weight. The results indicated that prazosin is effective in reducing the spontaneous motor activity and induces catalepsy and also inhibited the conditioned avoidance response (dose dependent) in albino rats. This gives evidence of changes in noradrenergic activity produces modulatory effect on dopaminergically mediated behaviours.

IV A: 36 ANTI-INFLAMMATORY, ANALGESIC ACTIVITY OF ASCORBIC ACID IN ALBINO RATS.
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Biologically derived oxidants, liberated by phagocytosing leucocytes, are known inflamogens and the superoxide dismutase enzyme has been reported to possess anti-inflammatory activity by its virtue of scavanging superoxide radicals. Ascorbic acid (AA), a reducing agent, has also been reported to scavenge free radicals1. Therefore, in the present study AA has been investigated for its possible anti-inflammatory activity in Wistar rats weighing 100-150 G.

Inflammation was produced by carrageenan injection in hind paw of rats (30') pre-treated orally with AA 22.5 mg/kg, AA 45 mg/kg, Aspirin (ASP) 54mg/kg, ASP 200 mg/kg, AA 22.5 mg/kg + ASP 54 mg/kg. Controls received gum acacia. Paw oedema was measured 1/2, 1, 2 and 3 h after carrageenan injection with the help of mercury plethysmograph. These animals were simultaneously tested for analgesic activity by caudal immersion test. The results were analysed by student’s ‘t’ test.
AA 45mg/kg, ASP 200 mg/kg produced significant (P < 0.01) anti-inflammatory and analgesic activity. AA also potentiated anti-inflammatory and analgesic activity of aspirin.


F: IV A : 37 EFFECT OF NITRENIDIPINE, NIMODIPINE & NISOLDIPINE ON AUDIOGENIC, ELECTROSHOCKS & PTZ INDUCED SEIZURES IN RATS.

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Calcium entry blockers of dihydropyridines type are widely used in the treatment of various cardiovascular diseases. However, studies regarding the role of these compounds in cerebrovascular diseases are few. Therefore, the present study was carried out in rats to explore if nitrendipine (NT), nimodipine (NM) and nisoldipine (NS) would antagonize audiogenic, electroshock and PTZ induced seizure in rats.

Albino rats of either sex (120 - 150 g) were divided into 3 groups of 20 rats each in group I, II & III. NT, NM & NS (5 mg/kg, i.p.) respectively were given 45 min before the predetermined convulsion challenges (PTZ 70 mg/kg i.p., audiogenic stimulus & electroshock).

NT, NM & NS pretreatment significantly protected the rats against PTZ, audiogenic & electroshock induced seizures.

F: IV A : 38 ANTI-INFLAMMATORY ACTIVITY OF BENZODIAZEPINES: AN EXPERIMENTAL STUDY.

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Some benzodiazepines (BDZ), such as diazepam have been reported to possess analgesic, antipyretic, anti-ulcerogenic and anti-inflammatory activity; whereas alprazolam, another BDZ, is reported to be devoid of any such activity. It is, therefore, indicated that benzodiazepines differ in their pharmacological profile despite possessing a common chemical nucleus. Kinins and prostaglandins, the mediators of pain, are also involved in the pathogenesis of inflammation. Therefore, the drugs possessing analgesic property may also have potential for anti-inflammatory activity since some common mediators are involved in both.

In view of these observations, the present study has been undertaken to investigate the analgesic and anti-inflammatory activity of three commonly used BDZs viz., diazepam, chlordiazepoxide and alprazolam, alone and in combination with sub-anti-inflammatory (SAI) dose of aspirin—a known analgesic and anti-inflammatory agent.

The study has been carried out in albino rats using both acute and sub-acute models of inflammation and three graded therapeutic equivalent doses of each drug. Diazepam,
chlordiazepoxide and alprazolam showed dose and duration dependent significant anti-inflammatory and analgesic activity. These drugs potentiated the anti-inflammatory activity of aspirin. Peripheral BDZ receptors could be the possible site of action.

F: IV A: 39  EFFECT OF ASPARTATE AND GLUTAMATE ON PAIN THRESHOLD, CATALEPSY AND RECTAL TEMPERATURE IN RATS.

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The effects of amino acids, Aspartate and Glutamate on analgesia, catalepsy and temperature were studied in albino rats. Both Aspartate and Glutamate were administered by an intracisternal injection. Analgesia was evaluated by tail flick reaction time to thermal stimulation. Anticataleptic effect was studied as antagonism of Morphine, Haloperidol, Chlorpromazine and Trifluoperazine induced catalepsy.

Aspartate and Glutamate significantly increased tail flick reaction time as compared to control reaction time though Morphine was much more potent in this regard. Both Aspartate and glutamate effectively antagonised catalepsy induced by various drugs. These excitatory neuro-transmitters produced a hyperthermic response in all the animals; also these antagonised Reserpin induced hypothermia.

Both Aspartate and Glutamate had a comparable analgesic, anticataleptic and hyperthermic effect in rats.

F: IV A: 40  EFFECT OF CALCIUM CHANNEL BLOCKERS ON EXCISION WOUND HEALING IN ALBINO RATS

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Calcium channel blockers (CCB) can modify a number of physiological functions and pathological changes by interfering with cellular calcium influx, a crucial event in cellular function. Verapamil, a CCB has been reported to inhibit inflammation which serves as an initial step in wound repair. However, there is paucity of information regarding influence of CCB on wound healing. Hence the present study was undertaken to investigate influence of CCB on excision wound healing. Three commonly used CCBs viz., verapamil, diltiazem and nifedipine in their clinical equivalent doses, have been investigated for their influence on excision wound healing in albino rats.

Full thickness excision wounds were inflicted as described by Morton and Malone. Closure of wound contraction at different time interval, number of days for complete epithelization and scar features were monitored in control and treated groups. The results were analysed by Students’ ‘t’ test. Verapamil and diltiazem enhanced wound contraction.
and epithelization significantly while nifedepine enhanced wound contraction; but failed to enhance epithelization.

To probe the mechanism of pro-healing effect and for clinical utility, further studies in this regard are needed.

F: IV.A: 41 EFFECT OF GLUTAMIC ACID ON MORPHINE INDUCED TOLERANCE AND DEPENDENCE

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Experiments were conducted on nine rats weighing 300-350 gms. Daily two injections of morphine sulphate (10mg/kg) were given for a period of 9 days to produce tolerance. The tolerance and dependence was assessed by measuring the tail flick withdrawal latencies using the hot water test. Recordings were taken till day 12. On day 13, glutamic acid 20 mg/kg (an NMDA antagonist) was given intraperitoneally (1st dose) and subsequently again on day 17 (2nd dose). Recordings were taken till day 23, and the effects on morphine induced responses studied.

Morphine (10 mg/kg) produced marked analgesia in 7 out of 9 rats as observed by a increase in the pain threshold latencies, which was followed by a withdrawal response. Glutamic acid (20 mg/kg) given in two doses partially blocked the morphine induced withdrawal response in all the 7 rats as evidenced by a slow return of the pain threshold latencies.

The inhibition of the morphine induced withdrawal response by glutamic acid suggests the possible mediation of the NMDA receptors in the behavioural changes produced by morphine. The drug may act by either interfering with the associative processes involved in withdrawal response or by a cellular action, and needs to be worked out further.

F: IV.A: 42 EFFECTS OF CALCIUM, STRONTIUM AND BARIUM ON ISOLATED PHRENIC NERVE-DIAPHRAGM PREPARATION OF RAT AND THEIR INTERACTIONS WITH DILTIAZEM AND NIFEDIPINE


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Barium and strontium being placed in the same group as that of calcium are expected to exert similar chemical influence and thereby produce similar pharmacological effects. In order to explore the possibility of similar effects by barium and strontium on a skeletal muscle, the present study was taken up to observe the effects of Ba⁺⁺ and Sr⁺⁺ on the contraction of rat phrenic nerve-diaphragm preparation following electrical stimulation. The effects of nifidpine and diltiazem and their interactions with the above mentioned cations on the tissue were also studied in the anticipation that the cations may follow the same pattern and ion channels as that of calcium.
Low doses of strontium chloride, barium chloride and diltiazem were able to increase the force of contractions of the rat diaphragm when actively stimulated. Diltiazem inhibited the stimulant effects of Sr\(^{2+}\) and Ba\(^{2+}\). On the other hand, nifedipine blocked the effect of Sr\(^{2+}\) but potentiated the effect of Ba\(^{2+}\).

Strontium and barium restored the contractility of the muscle following electrical stimulation when the tissue has been absolutely depleted of calcium.

These findings suggest that Sr\(^{2+}\) and Ba\(^{2+}\) may be able to substitute Ca\(^{2+}\) in the rat diaphragm for its contraction and that nifedipine and diltiazem may follow different mechanisms of action or channels in their blocking effects.

F:IVA:43  FEMALE GONADAL SEX STEROIDS POTENTIATE THE ANTICONVULSANT ACTIVITY OF PHENYTOIN.

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Literature survey reveals that female gonadal sex steroids (FGSS) influence seizure expression and that seizure occurrence may be affected by, both the endogenous or exogenous, variations in the FGSS levels. With this in view the present study investigates the influence of oral contraceptive (OC) doses of FGSS on seizure expression and on the anticonvulsant activity of a pre-determined subanticonvulsant dose of phenytoin.

Female Wistar rats, responding positively to both Maximal Electroschock Seizure (MES) and Minimal Electroschock Threshold (MET) tests, received FGSS in OC equivalent doses alone, in mutual combination or in combination with the subanticonvulsant dose of phenytoin; for an appropriate time before the MES & MET tests. Control group received either vehicle or saline.

The oral contraceptive equivalent doses of estrogen, progesterone or their combination did not significantly influence MES & MET, but they did potentiate the anticonvulsant activity of the subanticonvulsant dose of phenytoin in MES.

Observation that FGSS potentiated the anticonvulsant activity of phenytoin needs further probing both in the laboratory and in the clinical setting.

F:IVA:44  HEALING CUTANEOUS WOUND: STATUS OF FREE RADICAL SCAVENGERS

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Although wound healing is a physiological process, pharmacological interventions are being tried since long time to enhance the healing process. This approach may be helpful for healing chronic wounds. Among many factors involved in healing, there is evidence that free radicals may also play an important role. The present investigation was undertaken
to explore the role of free radical scavengers in healing. Different enzymatic (Superoxide
dismutase, Catalase, Glutathione-s-transferase, Glutathione reductase and Glutathione
peroxidase) and non-enzymatic (Vitamin E, ascorbic acid and reduced glutathione) free
radical scavengers were estimated at different time intervals (2, 4, 7 and 14 days) of a healing
cutaneous wound. Except glutathione reductase, all other enzymes were found to decrease
in this wound tissue following wounding and their activities recovered either partially or
completely at 14th day post wounding. Similar to enzymatic observations, non-enzymatic
antioxidants were also found to decrease following injury, and only glutathione content
returned to normal level at 14th day while Vitamin E and ascorbic acid remained depleted.
The data showed a decreased antioxidative potential of healing wound. This study may
provide an idea of future therapeutic interventions of free radical scavengers in wound
healing.

F: IB: 45 CONTRIBUTION OF DIFFERENT COMPONENTS OF A MEDICAL
ENTRANCE TEST TO THE SELECTION PROCESS

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A comprehensive medical entrance test comprising of 200 multiple choice questions
was administered to 931 candidates, of whom the top 30 were selected. The scores of the
30 selected candidates (Group 1) in different sections of the paper were compared with the
corresponding scores of the immediately next 30 candidates (Group 2). While the total score
and the aggregate in biology, physics and chemistry (BPC) were significantly different in the
two groups (P < 0.01), there was no significant difference in the scores of the two groups in
English (ENG), general knowledge (GK) or aptitude for medicine (APM). Further, the APM
scores of both groups were extremely high. In order to assess whether the selected candidates
did indeed have a uniformly high aptitude for medicine, they were administered a five-factor
index (FFI) personality test and ways of coping (WOC) test to get a composite score (APT) as
an indicator of the aptitude for medicine. The correlation between APM and APT was poor
(r = 0.44). The study suggests that in the entrance test administered, the selection was based
almost entirely on the biology, physics and chemistry sections, and that the questions on
aptitude for medicine have poor validity.

F: IB: 46 INTELLIGENCE-LEARNING STYLE INTERACTION IN ACHIEVERS

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A group of 30 recently admitted medical students were administered Raven's standard
Progressive Matrices and a standard 30-item inventory of approaches to learning. The score
in Progressive Matrices was considered an indicator of intelligence, and the net score in the
learning approaches inventory was considered an indicator of quality of learning style. The students fell in one out of four broad groups. The first group, comprising the least intelligent students (n=5) had quite good, but not the best, approach to learning. The second group of students (n = 5) had the best learning approach and medium level of intelligence. The third group of students (n = 8) had the highest intelligence and a broad range of learning approaches. The fourth group of students (n = 12) stood at an intermediate level with respect to intelligence as well as the learning approaches.

The observations reveal that first, relatively less intelligent students are successful in a difficult competition only if they adopt healthy learning approaches. Secondly, the best learning approaches are adopted by students who are intelligent enough to select the best learning style but not so intelligent as to be able to ignore the value of the learning style. Thirdly, the most intelligent students do not necessarily have the best learning style.

**F:IB:47 INTEGRATED TEACHING OF THE NERVOUS SYSTEM BY THE DEPARTMENTS OF PHYSIOLOGY AND ANATOMY**

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Preclinical subjects are expected to lay the foundation for developing clinical acumen, yet students find them too theoretical to be interesting. One of the reasons could be fragmented manner in which they are taught.

Integration is "to make entire" or to organize teaching matter to inter-relate or unify different subjects. By integration both at intradepartmental and interdepartmental levels, students can be given a holistic instead of fragmented outlook on the subjects. This would make the subjects more meaningful, interesting and no more drab and boring.

This paper deals with the need for integration, methods employed, advantages, difficulties and our experience of integration. Considering the ever-expanding volumes of texts and lack of teaching time, integration has bright prospects though it involves innovative approach, hard work and co-operation among various staff members.

**F:IB:48 APPLICATION OF PSYCHOPHYSIOLOGICAL PRINCIPLES IN DEALING WITH STUDENTS WITH SPECIAL NEEDS: OUR EXPERIENCE IN THE LAST TWO AND A HALF YEARS.**

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A project was undertaken with an aim to help those students who fell short of passing levels in the departmental assessment program in the I and II term in the I MBBS.

Initial sympathetic approach with an emphasis on the regular and hard study met with limited success. This forced us to become more sensitive to the problem of
underachievement. Consequent empathetic interviews with them followed by a written feedback from them revealed that academic failure is a symptom of maladjustment to the new reality of medical education.

Important common characteristics of these students were (i) poor learning skills and attitude, (ii) Poor proficiency in English and (iii) Negative self-concept and associated diffidence and introversion. High level of anxiety and psychological stress was found amongst them.

Most of these could be effectively addressed by an approach which employs psychophysiological principles. This paper deals with the two-pronged approach - one, at the psychological level and the other, at the academic level - which we had to develop to make them self-reliant and confident in meeting the challenges of their academic life. Group-session to boost their degree of motivation were held. Periodic assessment specifically designed for them tried to incorporate the element of positive reinforcement.

Considering the improvement shown by students who could be followed consistently, we intend recycling the project with a greater degree of organization and wider application of the psychophysiological principle.

**F: I B: 49**  
**PRESENT STATUS OF MEDICAL EDUCATION IN INDIA**

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With the changing economic scenario of the country due to liberalisation, the medical needs of our society are also rapidly changing. This has put an obligation on medical educationists and medical teachers a special responsibility of producing medical personnel, both the basic doctors and medical teachers, who can cope with the fast growing needs of the society in terms of quality and quantity both. Medical education should be need-based. Every student at the time of admission should execute a bond of Rs. 5 lacs, and should be posted to serve the rural areas for a period of three years.

Formation of the Central Medical University will solve the problems of uniform system of selection of medical student running uniform syllabus and course of studies and uniform pattern and standard of assessment of medical students. Adequate staff and infrastructure should be ascertained by and periodic surprise inspections should be conducted to ensure the standard of teaching. Some of the medical colleges in the country are in highly deplorable condition.

The salary structure, promotion and transfer policies of medical teachers should be drastically revised and modified. The salary of teachers of private medical college should be paid by Human Resource Development Ministry of Govt. of India.

Indian Medical & Health Services must be formed at the earliest possible date, so that the medical personnel are placed at par with other All India Services. A Bill to this effect was passed in the Parliament in 1969, but no efforts have been made so far to implement it.
F:IB:50 RELATIONSHIP BETWEEN VERTICAL REACH AND LEVELS OF REPRESENTATION OF VOLLEYBALL PLAYERS

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To find out whether some differences exist in different reaches viz., stature reach (Height, H-1), maximum vertical reach in standing position with extended arm (H-2), maximum vertical reach after jump with extended arm (H-3), net vertical jump (H-4) and maximum vertical reach in air with extended arm (H-5), of volleyball players of Punjab with different levels of representation, 130 healthy male players were studied. The players were taken from 13 different institutions of Punjab and were divided into six different categories according to their levels of representation viz., School, College, University, Punjab Police (P.P) Border Security Force (B.S.F.) and Bhakhra - Beas Management Board (B.B.M.B.). The volleyball players with higher levels of representation have been found to possess significantly better mean values of H-1 than other players. The B.S.F. players had significantly higher mean values of H-1, H-2 and H-3 when compared with players belonging to other categories. The mean values of H-4 and H-5 of B.S.F. players were significantly better than those of school, college and university players. The Punjab Police (P.P) players were observed to have significantly better mean values of all types of vertical reaches taken in the study than those of school players, where as in mean values of H-4 and H-5, P.P. players have been found to be better than university players. In H-1, H-2, H-3 and H-5 the college players have been found to possess significantly better mean values than school players. The university players have been found to possess significantly better mean values of H-1 and H-2 when compared with school and college players respectively.

F:IB:51 PHYSICAL BEHAVIOUR OF THE HONEY IN THE HYDROCHLORIC ACID (IN VITRO)

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The present study was aimed to study the physical behaviour (invitro) of the honey in the hydrochloric acid to determine the stability of the viscous gel formed by the honey. Honey being a viscous liquid and having antibacterial activity is used to assess its cytoprotective function if any. The hydrochloric acid (HCl) solutions of various pH ranging from 1.0 to 7.4 were prepared 20 ml of HCl was taken in each beaker and 5 ml of honey was added. Honey and HCl were mixed and incubated at 37°C for 8 hours. Observations were made at hourly intervals. The honey remained as thick viscous gel below the HCl even after 8 hours in all pH solutions. The results of the present study suggest that the honey may protect the gastric mucosa by forming a thick gel barrier between the mucosa and the gastric juice containing HCl and this may aid in its antibacterial activity against Helicobacter Pylori organisms which are associated with Gastritis, Gastric Ulcer and Duodenal Ulcer.
F:IB:52 EFFECT OF VITAMIN D DEFICIENCY ON ELECTROCARDIOGRAM OF RATS

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Twenty, 30 days old wistar rats were fed vitamin D deficient synthetic diet with adequate calcium and phosphorus (experimental group). After 16 weeks, rats were weighed and anaesthetized with nembutal. Electrocardiogram (ECG) was recorded from standard limb leads by using needle electrodes. ECG recording was analysed for heart rate, PR, QRS and QTc intervals. The animals were sacrificed and blood was collected for estimation of serum calcium level. The heart was removed weighed and heart/body weight ratio was calculated. Histology of heart was also done. Results indicated significant shortening of QTc interval, other intervals were normal when compared with age matched control rats. Heart/body weight ratio was significantly increased in vit. D deficient group which is an index of myocardial hypertrophy. An increase in collagen fibers on histology of myocardium was also seen.

It may be concluded that depletion of vit D in rats resulted in increased contractility of myocardium leading to shortening of QTc interval of ECG, inspite of normal S. Calcium level. This suggests direct involvement of vit D in regulating the activity of heart.

F:IB:53 IMPROVED VISUAL DISPLAY METHOD TO MONITOR INTRATHORACIC PRESSURE DURING VALSALVA MANOEUVRE

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During administration of Valsalva manoeuvre (VM) as a test of autonomic function, the subject is required to raise intrathoracic pressure to 40 mmHg which is usually monitored on mercury manometer. Such monitoring has poor display and cannot be used while subject is lying. To overcome these problems an improved method has been devised for better visual display of pressures. In this method mercury manometer is fitted (in the rise limb) with a series of contact switches that are prepared by cut edge of printed circuit board (PCB) having multiple strips. Alternatively, equally spaced silver wires are fitted in rise limb. Each copper strip on PCB or silver wire is then connected to light emitting diode (LED) through a dip switch. The strips/wires with distance of 10, 20, 30, 37, 40, 43, 50 and 60 mm are connected to different coloured LEDs to indicate respective pressures. One silver wire is fixed either in bulb of fall limb or much down place in rise limb and it is connected to LEDs through one 1.5 v cell. Then Hg manometer is filled with mercury to zero level (0 with respect to 10 mm strip/wire). As mercury column is raised, it makes contact(s) with strip(s) that illuminates LEDs, thereby giving visual display of pressures. Since specific pressure is indicated by specific LED, subject can be told to light desired pressure LED. With the use of selected dip switches, it is possible to narrow down the display to illuminate LEDs indicating 40 ± 3 mm Hg. The advantages of such device...
Epilepsy is a common neurological disorder in India. The anti-epileptic drug regimens are given on long term basis. Further, self-medication is prevalent and commonly, herbal remedies are taken for minor ailments like fever, cough and cold etc. So the present work was designed to study the pharmacokinetics of phenytoin, a widely used anti-convulsant, when co-administered with septilin, a herbal anti-infective. The study was carried out in healthy male rabbits (1.5 to 2.0 kg) with 8 animals in each group. For single dose kinetics, phenytoin (60 mg/kg. P.O.) was administered to overnight fasted animals. Blood samples (1ml) were drawn at 0,0.5,1,2,4,6,9,12 & 24h after drug administration. After a wash out period of 7 days, septilin (4 ml/kg.P.O.) was given for 7 consecutive days. On day 7, blood samples were drawn at 0,3,4,5,6,>&24h to determine peak and trough steady state concentrations of phenytoin. Plasma samples were stored at -20°C until assayed for phenytoin levels using HPLC method and pharmacokinetic parameters were assessed. The pharmacokinetics of single dose phenytoin was not altered to significant extent following septilin. In multiple dose study, Cmin and Cmax of phenytoin decreased while tmax increased significantly following septilin. The decrease in plasma phenytoin levels after multiple dosing could be either due to auto-induction of phenytoin or septilin. Further studies are being carried out to explore the exact mechanism.
Intrathecal L-glutamic acid 100 mmol, morphine 1.20 mmol and ketamine 50 mmol were injected individually and in combination to rats of each group.

L-glutamic acid has no effect on TFL except in oestrus phase where significant decrease was observed. Morphine-induced antinociception was attenuated in all groups and more so in oestrus phase. Ketamine antagonised attenuation of nociception caused by L-glutamic acid and morphine-induced antinociception was protected.

To conclude, oestrogen sensitizes NMDA-receptors in the spinal cord of rats and excite nociceptive processing during noxious stimuli.

**F: II B: 56  PRESCRIBING HABITS OF TEACHING AND NON TEACHING CLINICIANS.**

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Prescriptions play a crucial role in the health care system and rational prescribing not only minimises adverse effects but also provides better health care at the least expense. However, erroneous prescriptions have been detected even in a tertiary care teaching hospital to the tune of 3.13 to 4.22 per thousand. The present study was undertaken to study prescribing habits and to detect incidence of irrational prescribing in teaching and non-teaching medical practice.

Prescriptions from rural (Sindhanur) clinics (RC) (n=3730), Urban (Belgaum) clinics (UC) (n=1722) and KLES’s teaching hospital (TH) (n=1965) were analysed.

The practice of polypharmacy was similar in RC and UC (2.92 and 3.11 drugs/prescription) while it was least (2.76/prescriptions) in TH. Eighty percent (prescribed) drugs were injected in RC while the incidence of injections was 72.5% in TH and least (43.3%) in UC. Antimicrobials, analgesics and antihistaminics were more prevalent drugs in RC prescriptions while Vitamins and others were maximally prescribed in RC and TH. Overall errors per prescription and potential drug interactions were maximum in prescriptions of RC and least in TH.

Detection of various factors responsible for irrational prescription is essential to improve health care system and achieve Health For All by 2000 A.D.

**F: II B: 57  EFFECT OF SODIUM VALPROATE ON FOOD INTAKE**

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Sodium Valproate used for control of a variety of seizure states is a broad spectrum antiepileptic agent. It has, however, a low therapeutic index. It produces effect at higher dose levels.

Effect of ip administration of graded doses of sodium valproate has been studied on milk consumption on 15 minutes of exposure to reconstituted milk. In rat its effect in grade...
doses on ip and po administration on pellet food consumption during a period of 5 hours has been studied. Saline treated controls were run concurrently.

Sodium valproate, dose dependently reduced milk consumption in mice $ED_{50}$ being 177.2 mg/kg ip. Similarly, in rat it reduced pellet food consumption dose dependently both by ip ($ED_{50}$ 199 mg/kg) and oral route ($ED_{50}$ 363 mg/kg).

The results of the study indicate reduction in food intake both in mice and rat by ip and oral routes at dose levels which have been reported to produce antiepileptic effects.

**F:II B: 58 EVALUATION OF POSSIBLE MECHANISM OF ANTI-ULCEROGENIC ACTIVITY OF UL-409 A HERBOMINERAL PREPARATION**

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UL-409 a herbomineral preparation was investigated for its anti-ulcerogenic activity and possible mechanism of action in different experimental models. Oral administration of UL-409 at a dose of 600 mg/kg significantly prevented the occurrence of alcohol ulceration in rats. It reduced the Gastric volume total acidity and free acidity in aspirin+pylorus-ligated rats. The drug appeared to strengthen gastric mucosal defence mechanism by significantly increasing the total carbohydrate protein ratio in aspirin+pylorus-ligated rats. The major mechanism involved appears to be the promotion of mucosal protection by the augmentation of gastric mucin activity. Pre-treatment with UL-409 showed inhibition of alcohol-induced contraction of isolated rat fundus preparation which was reversed by aspirin suggesting a possible involvement of cyclo-oxygenase system.

**F:II B: 59 INTERACTION BETWEEN ASPIRIN AND SOME COMMONLY USED SULFONAMIDES ON INFLAMMATION IN ALBINO RATS.**

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Dapsone, sulfasalazine and some sulfonamides (that are not clinically used) like n-aryl sulfonamides have been reported to possess anti-inflammatory activity in animal models and clinical trials. However there is paucity of literature regarding such anti-inflammatory activity of clinically used sulfonamides. Hence to explore whether such drugs have any anti-inflammatory activity on carrageenan induced inflammation, a preliminary study was undertaken. None of these sulfonamides showed significant anti-inflammatory activity and further the study was extended to explore the interaction between aspirin and sulfonamides on inflammation. Effect of combination of sub anti-inflammatory dose of aspirin (54mg/kg) and clinical equivalent dose of sulfadiazine (90mg/kg), sulfanilamide (90mg/kg), sulfamoxole (90mg/kg) were studied on two models of inflammation viz. Carrageenan induced paw oedema (Winter et al 1962) and cotton pellet induced granuloma method (D’Arcy et al
1960). All drugs were administered once orally 30 min prior to carrageenan injection and once daily for 10 days in case of granuloma method. All the three sulfonamides did not produce significant anti-inflammatory activity by themselves in carrageenan induced paw oedema. However in combination with aspirin 54mg/kg, Sulfadiazine and Sulfanilamide produced significant anti-inflammatory activity in both models, suggesting a synergistic interaction between aspirin and these sulfonamides.

F: II B : 60 INTERACTION OF D-400 WITH ORAL HYPOGLYCAEMIC DRUGS AND INSULIN

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D-400 a herbomineral preparation has been established for its antidiabetic activity in experimental models as well as in clinical trials. The possibility of concomitant use of this drug with sulphonylureas as well as with insulin was explored in animal models. D-400 has been investigated for its interaction with oral hypoglycaemic agents tobutamide and glibenclamide and with insulin in alloxan induced diabetic rabbits. Administration of D-400 at a dose of 1gm/kg for 15 days significantly elevated plasma tobutamide and glibenclamide concentrations and simultaneous reduction of blood glucose was observed when compared to pretreatment value of tobutamide or glibenclamide alone. Plasma tobutamide and glibenclamide concentrations were significantly lowered after withdrawals of D-400 treatment. Elevation of plasma concentration of tobutamide was observed only for the first 4 hours after which it declined towards normal levels and maintained at the 8th hour. This was well comparable with initial values (before D-400 treatment). Elevation of plasma levels was observed for more than 8 hours in the case of glibenclamide. Administration of D-400 at a dose of 1gm/kg for 21 days significantly increased plasma insulin levels upto 2 hours. Percentage fall in blood glucose levels increased simultaneously upto 4 hours when compared to insulin treatment alone.

F: III B : 61 UP-REGULATION OF ANDROGEN RECEPTOR TRANSCRIPT IN RAT PROSTATE BY ANDROGENIC DEPRIVATION

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The androgen receptor (AR) functions as a ligand activated, transacting regulator of specific gene transcription. It mediates the actions of androgens and plays an important role in male physiology and pathology. We have studied the effect of androgenic deprivation on the level of transcript for AR in rat ventral prostate. Rats were either surgically castrated or subjected to treatment with estradiol benzoate, flutamide and (D- Trp" Gly" ) GnRH for different time periods. Total RNA isolated from the ventral prostate was hybridized with radioactive cDNA probe for AR. The autoradiographs were analysed for the intensity of
signal. Our results show that the level of AR RNA increases following treatment of rats with estradiol benzoate and flutamide. GnRH analogue on the other hand, produced only a transient rise in the level of AR RNA. Thus, all of these modes of androgenic attenuation produced up-regulation of AR transcript.

**F: III B : 62 PHYSIOLOGICAL AND BIOCHEMICAL CHANGES DURING ACQUISITION OF FERTILIZING CAPACITY BY SPERMATOZOA IN PRIMATES**

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Mammalian spermatozoa released from the testis do not possess in vivo fertilizing capacity which is acquired during transit through the epididymis. This is accompanied by changes in the physiology and biochemistry of spermatozoa. This report examines the changes in morphology, lectin binding and acquisition of proteins by rhesus monkey spermatozoa during epididymal transit. Sperm morphology was studied by scanning electron microscopy, lectin binding by using FITC labelled lectins and changes in protein by SDS-PAGE. During epididymal transit, rhesus monkey spermatozoa undergo gradual straightening of sperm tail. The percentage of coiling of sperm tail is 78% (initial segment), 49% (caput), 27% (corpus) and 9% (cauda). A gradual decrease in complexity of coiling is also seen. The percentage of spermatozoa which show localization of FITC labelled lectins (PNA and Con A) gradually increases; lectin is localised mainly in the acrosome. SDS-PAGE of sperm proteins shows acquisition of proteins of different molecular weights during sperm maturation. These data indicate that the process of acquisition of fertilizing capacity by rhesus monkey spermatozoa during epididymal transit is accompanied by change in morphology, physiology and biochemistry of spermatozoa.

**F: III B : 63 CELL MEDIATED IMMUNITY DURING PREGNANCY**

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It is recognised that there is a non-reactive status in the maternal immune system during normal pregnancy as it fails to recognise the foetus which is an allograft. This study was planned to understand the nature of cell mediated immunity and presence of immunosuppressive factors during pregnancy. The functional reactivity of lymphocytes was assessed by mitogen induced lymphocyte transformation, which was reduced during pregnancy. But it was not reduced in primigravidae and pregnant women with history of repeated abortions during first and second trimesters but there was marked reduction during third trimester. However no change was observed in mitogen induced transformation in multigravidae between the trimesters. Pregnancy sera from various trimesters suppressed mitogen induced normal lymphocyte transformation. Sera from primigravidae and pregnant women with history of repeated abortions showed high suppressive activity in third trimester.
whereas sera from multigravidae showed high suppression from all trimesters. It can be concluded that difference in lymphocyte function and suppressive effect of pregnancy serum maybe influenced by previous exposure to pregnancy.

**F: II B:64** Effects of short term administration of Tulsi leaves on body weight, food intake, fluid intake and reproductive behaviour in female rats.

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The effect of feeding Tulsi leaves along with the normal diet on reproductive behaviour of 15 adult female albino rats was studied. These rats were separated in individual cages and were given food and water ad libitum. Their daily food intake, fluid intake and body weight were measured and E. cycle was studied. Every day during fixed period each one of them were presented with a healthy male rat of proven reproductive activity. The female rat was kept with male for a total time of 10 minutes and during this time the number of mounts and Lordosis quotient were measured. After control study of two weeks the animals were divided into two groups. The control group consisted of five rats in which the study remained same as above. Experimental group consisted of 10 rats. These rats were given fresh Tulsi leaves extract (80 mgs per rat) for 2 weeks. After 2 weeks the Tulsi leaves were discontinued and they were given only water. During this period their sexual behaviour was studied. Reproductive behaviour in terms of Lordosis Quotient showed a marked decrease in rats consuming Tulsi extract. Even when Tulsi leaves were replaced by plain tap water L.Q. did not come back to normal which shows that Tulsi leaves have long term inhibitory effect on female reproductive behaviour. No significant changes were seen in the other parameters like body weight, food intake and fluid intake.

**F: III B:65** Effect of feeding Ocimum sanctum (Tulsi) leaves on fertility in rabbits.


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Fresh Ocimum sanctum (Tulsi) leaves (1 g/kg body weight) were given twice a week for one month to sexually matured rabbits (both male and female) of proven fertility. Significant changes in the histology of the testis, epididymis, uterus and ovary were observed in Tulsi fed animals. In testis spermatogenic elements were markedly degenerated and number of spermatozoa was significantly reduced in epididymis. In female rabbits fed with tulsi leaves showed edema and congestion in all layers of the uterine wall with increased vascularity and haemorrhagic corpus luteum was seen in the ovary. Pregnancy and subsequent delivery occurred in only those rabbits which were allowed to mate one month after the stoppage of
feeding of tulsi leaves as compared to those allowed to mate immediately after one month of treatment with tulsi leaves. It may be concluded that changes observed in the reproductive organs of rabbits after feeding tulsi leaves are reversible and fresh leaves of this easily and cheaply available, pleasant smelling plant may be tried as an oral contraceptive in human beings after systematic investigation.

F: III B : 66 BASOPENIA AS AN INDICATOR OF OVULATION
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In the present study 60 cases, age ranging from 18-40 years were studied for variation in the absolute basophil count during different phases of menstrual cycle. Detailed menstrual history was taken to find out a probable date of ovulation. Other conditions that may cause basopenia were ruled out. In all the cases count was done in the follicular phase and from 3 days prior to the probable date of ovulation every day till the day of ovulation and then in the luteal phase. Simultaneously the cases were monitored with ultra sonography.

At the time of ovulation a statistically significant decrease in the number of basophil count was noted. The decrease in the number of basophil at mid cycle coincided with the irregular follicle seen by Sonography, which indicated ovulation. The basophil count then increased during the luteal phase. The mean values / cumm during follicular phase, two days prior to ovulation, one day prior to ovulation, on the day of ovulation, and luteal phase were 42.5, 27.4, 20.9, 12.1 and 57.8 /cumm respectively. The differences between different phases were statistically significant.

Basopenia at the time of ovulation was probably due to migration of these cells from the peripheral blood towards the rupturing follicle for the release of histamine required for ovulation.

F: III B : 67 PHYSIOLOGICAL RESPONSE OF PUERARIA TUBEROSA EXTRACT IN MALE AND FEMALE REPRODUCTIVE ORGANS
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Pueraria tuberosa (DC) Faboidea has been reported to manifest significant contraceptive effect in rats, mice, guinea pigs and hamsters. Biochemical and physiological alterations have been observed in the testis, ovary and uterus of intact and pregnant rats. In the male rats the extract causes severe degenerative changes in the testes and accessory sex glands. These changes were induced after 2 weeks of exposure but recoupment was observed after 120 days. In pregnant animals its administration from day 1 to 5 post-coitum caused significant alterations in the glycogen content; activity of acid phosphatase, ATPase and alkaline phosphatase. Uterine histoarchitecture appeared non receptive at the day of implantation.
EFFECT OF SEPTAL LESIONS ON REPRODUCTIVE FUNCTIONS IN MALE RATS
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It has been demonstrated that septal lesioned rats have continuous estrous and increased estrogen in urine and inhibition of new follicular growth. Similarly septal nuclei exert influence over ovaries as is manifested by reduction in ovarian and uterine weight, marked disruption of estrous cycle and suppression of sexual activity in lesioned animals. Evidence is also accumulating to indicate that the septum may be involved in male sexual behaviour. However, no reports are available on effects of septal lesions on testicular and sperm morphology.

40 Adult Wistar rats aged between 120-180 day and weight 250-300 gms were selected and kept under standard laboratory condition. Animals were randomly assigned to Group I (m = 16) and Group II (n = 24). Group I animals were used to study the effect of septal lesion on sexual behavior, fertility and testicular morphology. Group II animals were used to study the effect of septal lesion on sexual behaviour, sperm count, sperm motility and testicular morphology.

In this study bilateral septal lesions inhibit sexual behavior, reduce testicular weights, sperm count and fertility and alter the testicular morphology in male rats. This indicates that septal nuclei also control the function of reproductive organs in male rat, probably by affecting the hormonal function.

PROTEIN GLYCATION AND THE PATHOGENESIS OF DIABETIC OCULAR COMPLICATIONS
Shivaprasad S. Goudar, A Nirmal Kumar*, S.B.Kulkarni**

Measurements of blood glucose concentration and urinary glucose excretion have guided the assessment of glycemic control and modification of treatment in diabetics. While these represent measurements, at single points in time, selected from a widely changing pattern of glycemic control, estimation of Glycated Haemoglobin (GHb) offers a cumulative index of the glycemic status over the preceding two to three months period. In the present study GHb levels were estimated, in 25 freshly detected diabetics and 20 controls, by a colorimetric method based on the phenol sulphuric acid reaction for carbohydrates. Mean GHb level in freshly detected diabetics (0.95±0.02 mol/mol) was significantly higher than in controls (0.65±0.02 mol/mol). All the subjects were screened for the presence of diabetic ocular complications viz. cataract and retinopathy. Mean GHb level in diabetics with ocular complications (n = 5, 1.06 ± 0.12 mol/mol) was significantly higher than in diabetics without ocular complications (0.92±0.01 mol/mol). Nonenzymatic protein Glycation (Maillard) reaction has been proposed as the link between chronic hyperglycemia and the pathogenesis of diabetic complications through the formation of Advanced Glycation End-products (AGEs).
The protein bound AGEs have been detected on several tissue proteins like collagen, laminin, lens crystallins, low-density lipoproteins and albumin, by immunochemical and fluorescence techniques. Measurement of Haemoglobin - AGE, as a circulating marker of advanced glycation, may be superior to GHb estimation for predicting the longterm risk of diabetic ocular complications. Tissue - bound AGEs could be useful as long-term integrators of glycemic control.

F:III B : 70 USE OF RECOMBINANT SOMATOTROPIN (rST) FOR GROWTH

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To augment growth particularly in meat animals both the hormonal as well as nonhormonal preparations have been used since long and out of all these, somatotropin has been claimed as the most effective. With the availability of recombinant somatotropin a new era for its application has started. Considering certain constraints for its optimum efficacy an experiment was set up with rats maintained on isocaloric ration with one of the three dietary protein levels (6, 11 & 16 percent). Three dosages of somatotropin were selected (0.1, 0.5 and 2.0 mg/day) to study the dose dependent response of somatotropin. For four weeks body weight and food intake were recorded every three days. At the end of the growth study rats were killed and weighed. Weights of visceral organs, muscles, heart and empty gut were recorded and serum IGF-I & II were estimated.

Weight gain and food intake indicated significant response to recombinant somatotropin when rats were fed 11 & 16% protein diets. The response was dose dependent and 2.0 mg/day had the greatest response on 16% dietary protein. On 11% protein, a dose of 0.5 mg/day had a similar effect to that of 2.0 mg/day somatotropin. The low dietary protein level (6%), somatotropin had an adverse effect, at 2.0 mg/day on body weight, but the lower dose of 0.5 mg/day improved body weight gains: 0.1 mg/day of somatotropin was without effect.

Serum IGF-I analysis had indicated a direct correlation with dietary protein level. Somatotropin increased IGF-I levels at 6% and 11% protein diets, but not at 16% protein diet. Highest IGF-I levels were recorded with 2.0 mg/day on 6 & 11% proteins.

Rats treated with 0.5 and 2.0 mg/day somatotropin had an increased feed if fed the 11 or 16% but not the 6% protein diet. Heart, spleen and kidney weights were higher at 16% protein but not at 11% & rather lower at 6% protein.
F: III B: 71 HORMONE RECEPTORS AS PROGNOSTIC MARKERS IN BREAST CARCINOMA IN CORRELATION WITH HORMONES AND OTHER TUMOR MARKERS

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Estrogen Receptors (ER) were estimated in breast carcinoma (BC) tissues and the levels were correlated with estradiol, prolactin, hCG, αFP and CEA in BC patients. The concentration of estradiol (measured in 150 BC patients) in ER+ tumors was considerably higher than in ER- tumors. Prolactin level was measured in a series of 91 BC patients and correlated with both ER and progesterone receptor (PR) concentrations. Prolactin level in ER+ PR+ group was 480 + 215 mIU/ml while it was 593 + 250 mIU/ml in ER+ PR- group. Highest level of prolactin 864 + 266 mIU/ml was estimated in ER- patients, showing a negative correlation of prolactin levels with ER population. Other tumor markers viz. hCG, αFP and CEA were measured in a series of 40 BC patients in blood obtained at the time of mastectomy. BC ER levels in these patients when compared with the circulating levels of hCG, αFP and CEA did not reveal a significant correlation.

F: III B: 72 ZINC DEPLETION AND MENORRHAGIA IN WOMEN USING MULTILOAD CU-250 INTRAUTERINE DEVICE

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A 12 month follow-up study was undertaken to evaluate the effect of using multiload Cu-250 intrauterine device on the hemoglobin and some trace element levels (Zn and Cu) in Kashmiri Women. A total of 45 women were studied, including 25 who were using multiload Cu-250 and 20 controls. Concentration of serum Cu and Zn were estimated by GBC-902 Double Beam Atomic Absorption Spectrophotometry. The results showed that after 12 months, the mean serum zinc, hemoglobin and hematocrit values were significantly lower (P<.01) than initial concentrations and that of normal non-users. However, serum copper increased significantly in the study group (P<.01). It is suggested that the low zinc status was probably responsible for the menorrhagia which was common among the study group using copper IUD’s which in turn was responsible for the anemia seen in more than 50% of the IUD users. Increase in copper level and decrease in zinc may be a result of alterations during the acute phase response associated with the insertion of multiload Cu-250. The monitoring of hemoglobin, hematocrit value and the serum zinc may therefore enhance the prophylactic use of the intrauterine contraceptive device to control menorrhagia, which ultimately leads to development of anemia in this group.
F: IV B: 73  PREVENTION OF BERYLLIUM INDUCED TOXICITY AFTER THE ADMINISTRATION OF GYMNEMA SYLVESTRE LEAVES IN ADULT RATS

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Beryllium compounds are known to be highly toxic in laboratory animals and in humans. In the present study powdered leaves of Gymnema sylvestre have been tested against the toxic effects of beryllium in female albino rats. It was observed that beryllium induces alteration in various biochemical indices in liver, kidney and uterus. Tissue glycogen content and activity of acid and alkaline phosphatases reduces significantly. Evidence showed that G. sylvestre prevents most of the above beryllium induced biochemical alterations. Histological changes induced during beryllium toxicity were also significantly less marked following the treatment with plant leaves.

F: IV B: 74: THE INFLUENCE OF TRICYCLIC ANTIDEPRESSANTS ON RESUTURED INCISION AND DEAD SPACE WOUND HEALING IN ALBINO RATS.

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Intravenous desipramine (DMI), a tricyclic antidepressant (TCA), is known to release growth hormone (GH) in rats. GH is essential to promote normal tissue growth and may have an important role to play in the process of wound repair. However, the influence of TCAs on wound healing appears to be poorly documented. The present study was, therefore, undertaken to probe their influence on wound healing.

Desipramine (18mg/kg), Clomipramine (18mg/kg) and amitryptiline (18mg/kg) were administered orally to different groups of Wistar rats of either sex weighing 150-250G. Resutured incision and dead space wounds were monitored by assessing the wound breaking (tensile) strength of incision wounds and granulation tissue, granuloma dry weight, histology of granuloma and its hydroxyproline content. Both Clomipramine and Desipramine hastened the healing process of resutured incision as well as dead space wounds significantly while Amiptyline not only failed to do so, but retarded the process significantly.

F: IV B: 75: HEPATOPROTECTIVE ACTION OF A PROPRIETARY HERBAL PREPARATION AGAINST CCl4 INTOXICATION

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Preparations based on plants used in traditional medicine have been widely employed in India as an alternative to allopathic drugs. In the present investigation, a proprietary herbal formulation of nine medicinal plants is tested for the hepatoprotective efficacy. Administration of CCL4 to normal rats caused increase in the levels of transaminases, blood sugar and
activity of alkaline phosphatase. Significant alterations were observed in glycogen content, activity of ATPase, G 6-Pase and lipid peroxidation. Ultrastructural studies also showed swelling in the mitochondria, marked dilation, degranulation and loss of organization of rough ER. PHP provided significant protection against most of the biochemical and histopathological alterations produced by CCL4. Degree of protection was maximum at 250 mg/kg dose.

F:IV B:76 INFLUENCE OF ANGIOTENSIN CONVERTING ENZYME INHIBITORS (ACEIS) ON INFLAMMATION IN ALBINO RATS.

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In view of the reported anti-inflammatory activity of captopril in clinical studies and its failure to produce anti-inflammatory activity in experimental study prompted investigation of other commonly used ACEIs for their possible anti-inflammatory activity if any.

Inflammation was produced by carrageenan injection in hind paw and implantation of foreign bodies in axilla and groin, of albino rats. Enalapril (16mg/kg b.w.) and Lisinopril (2mg/kg b.w.) were administered orally in their therapeutic equivalent doses.

Both the drugs failed to show significant anti-inflammatory activity in both the models of inflammation. On the contrary they enhanced acute inflammation produced by carrageenan.

Gastric ulcer index in animals treated with enalapril and lisinopril was comparable to that of aspirin treated animals. Lung histology revealed dilated alveoli, alveolar haemorrhage and septal congestion.

Both the drugs failed to show analgesic activity.

F:IV B:77 EFFECT OF LIV-52 AND FORTEGE ON LANTHANUM CHLORIDE INDUCED TOXICITY

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A number of chemical agents are reported to intercept fertility in animals. Metals are an important class of such chemicals. Lanthanum is a rare metal which is gaining importance in industry due to its various uses. There is no specific antidote reported for lanthanum toxicity. In the present study the author has tried to find out the protective action of Liv-52 and fortege against lanthanum chloride toxicity on some biochemical parameters in blood and reproductive organs. With lanthanum chloride significant decrease was observed in the blood sugar level, however, cholesterol level was increased. There was alteration in biochemical parameters of reproductive organs also. Marginal recoupment in biochemical and histological parameters was observed with Liv-52 and fortege after 60 days of exposure to lanthanum chloride.
Neurotoxicity of P-Chloroamphetamine on Serotonergic Neurons is Blocked by Fluoxetine

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P-Chloroamphetamine (PCA) is toxic to serotonergic neurons producing long lasting depletions in brain levels of 5-HT and its metabolite 5-HIAA in the brain. Different groups of adult, male Sprague-Dawley rats were injected with: 1) Saline, 2) PCA (8 mg/kg), 3) Fluoxetine (10 mg/kg) or 4) Fluoxetine (10 mg/kg) followed 20 minutes later by PCA (8 mg/kg). They were sacrificed 1, 3, 7 or 14 days later. The hypothalamus, hippocampus, cortex, midbrain and striatum were dissected out and the 5-HT and 5-HIAA levels were estimated by HPLC with electrochemical detection. PCA produced depletions of 5-HT and 5-HIAA levels up to 14 days after administration. Fluoxetine produced slight increase in 5-HT and 5-HIAA levels but at 14 days, the levels returned to normal values. Pre-treatment with fluoxetine prevented the PCA-induced decrease in 5-HT and 5-HIAA levels and protected against the PCA-induced neurotoxicity. The results indicate that the toxic effects of PCA on the serotonin neurons can be prevented by the selective serotonin uptake inhibitor, fluoxetine. It implies that the reuptake site is involved in the transport of PCA or the endogenous metabolite of 5-HT in the mechanism of PCA-induced neurotoxicity. The role of fluoxetine elucidated in these experiments make this model suitable for neurochemical screening of selective 5-HT reuptake blockers.

Effect of Jatamansi on Alcohol Withdrawal Syndrome

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The aim of present study was to evaluate the efficacy of Nardostachys jatamansi (family - valerianaceae) in management of alcohol withdrawal in mice. Ether extract of jatamansi was fractionated into acetone soluble and insoluble fractions. The residue after pet ether (60° - 80°) extraction was further extracted with alcohol. Acetone soluble fraction and alcoholic extract afforded protection against Pentylenetetrazole (PTZ) induced convulsion in alcohol withdrawn mice. Alcohol extract was more potent than acetone soluble fraction in reducing the severity of alcohol withdrawal syndrome.

Role of Vanadate and Insulin on Glycolytic, Kreb's Cycle and Defence Enzymes in Reticulocytes and Whole Blood of Experimental Diabetic Rats

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Reticulocytes encompass Kreb's cycle enzymes for few hours after coming into the circulation and these cells experience a high blood glucose level in diabetic condition. In such condition it was needed to measure metabolising enzymes like hexokinase (HK), glucose-
6-phosphate dehydrogenase (G6PDH), isocitrate dehydrogenase (ICDH), malate dehydrogenase (MDH) and the defensive enzymes like glutathione peroxidase (GPX), glutathione reductase (GR) and glutathione-s-transferase (GST). Reticulocytes were enriched after phenylhydrazine treatment to rats and these cells were separated on continuous gradient of percoll. The enzymes were measured in reticulocytes as well as in whole blood of controls, controls treated with vanadate, diabetes, diabetic rats treated with insulin and vanadate. It was observed that metabolising capacity of reticulocytes increased in diabetes, insulin normalised these enzyme levels but vanadate did not recover the enzyme levels. Increased levels of enzymes were also observed in reticulocytes of control rats when fed with vanadate. Vanadate also accelerated the metabolising capacity of blood erythrocytes in diabetic condition. It may be concluded that insulin normalises the metabolising capacity of glucose in reticulocytes but vanadate accelerated the rate of metabolism in diabetes, which also resulted in an increase of glutathione reductase which produces hydrogen-peroxide in cells.

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Zn, a trace element, present as integrated part of various enzymes, also participates in the maintenance of growth, metabolism, erythropoiesis and leucopoiesis. It is also recommended to improve wound healing, for disorders of taste, smell and the treatment of acne. Millions of individuals of middle age population taking Zn in multivitamin and mineral supplements, likely for prevention of various diseases like atherosclerosis, hypertension and prolonging of aging phenomenon.

The present study is carried out in 35 M and 35 F healthy subjects by giving orally 61.8 mg (equivalent to 25 mg of elemental Zn) daily for one month. Results show that the raised amount of Zn present in serum after supplementation significantly increases the Hb level in males and non significantly in females. It has produced significant change in ameth count in both sex suggesting its important role in growth and delaying the aging phenomenon. The results insignificant in females need further study to explore the role of female Hormones.


Significance of garlic in clinical application has come in prominence recently due to its hypolipidemic action. Hence a comparative study had been undertaken to evaluate the effect of three hypolipidemic agents- garlic, Vit. 'E' and Vit. 'C' on the serum lipid profile in normal human subjects.
humans. One hundred normal individuals of either sex were divided equally in four groups, fed on a routine normal diet. Individuals of control group were given placebo; while individuals of three study groups were fed with garlic, Vit. 'E' and Vit. 'C' respectively for 30 days. Blood samples were collected in all the subjects before and after therapy and levels of triglycerides (TG), total cholesterol (TC), low density lipoprotein cholesterol (LDL-C), very low density lipoprotein cholesterol (VLDL-C) and high density lipoprotein cholesterol (HDL-C) in serum were estimated by Boehringer Mannheim Diagnostic Kits.

Garlic was found to be highly significantly effective in lowering the serum levels of TG, TC, LDL-C and VLDL-C; while it significantly elevated the serum HDL-C level.

Vit. 'E' was found to have some effect in elevating HDL-C levels and reducing the LDL-C levels. Similarly Vit. 'C' was found to have some effect in reducing the TC and LDL-C levels but these effects of Vit. 'E' and Vit. 'C' were not statistically significant.

P: 03  EFFECT OF EXERCISE TRAINING ON PSYCHOLOGICAL FUNCTIONS IN NORMAL INDIVIDUALS.

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The objective of this study was to examine the effects of different types of Physical exercise training on Psychological functions of normal human individuals. Sixty normal young healthy adult males were taken as subjects. They were nonsmokers and disease-free. They were trained by combined limbs exercise training as well as by Walking training. Goldberg Health Questionnaire (G.H.Q.) Score test was done on them in the morning before and after exercise training. G.H.Q. Score test is an objective scorable test to assess the psychological functions of an individual. It was observed that walking exercise training causes highly significant improvement in psychological functions in the training individuals, whereas combined limbs exercise training does not cause a significant improvement in the training subjects.

P: 04  BIOCHEMICAL CHANGES OBSERVED IN THE PATIENTS WITH ORGANOPHOSPHOROUS POISONING

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The widespread use of organophosphorous insecticides in horticulture has focussed attention on the extreme toxicity of these compounds. 250 patients exposed to organophosphorous poisoning were evaluated for enzyme estimations as well as other blood parameters as the phosphorous from these insecticides inhibits the enzyme activity by forming some complex salts with enzymes. The enzyme activity tested in serum includes S.G.O.T., S.G.P.T., alkaline phosphatase, acid phosphatase and serum amylase and other parameters.
taken into study were blood urea, serum uric acid, serum creatinine, serum calcium, serum phosphorous and serum cholesterol. A significant fall is found in enzyme activities when the results were compared with normal subjects. Blood urea, uric acid found towards higher side of the normality, while serum calcium, creatinine and serum cholesterol found to be normal, but serum phosphorous found to be significantly higher than the normal.

P: 05

STUDY ON NOCICEPTION ON STREPTOZOTOCIN INDUCED DIABETIC RATS WITH REFERENCE TO FREE RADICAL INDUCED DAMAGE IN CELL MEMBRANE

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Both tonic and phasic components of pain perception were carried out in chronic (after two months) insulin-dependent diabetic rats induced by streptozotocin (50 mg per Kg body weight i.p.). Tail flick threshold (spinal reflex), vocalisation (reflex involving lower brain stem) or vocalisation after discharge (reflex involving hypothalamus and rhinencephalon) showed hyperalgesia in diabetic rats.

The formalin test (0.05 ml of 5% formalin s.c. injection in the dorsal surface of the forepaw) also showed hyperalgesia. Lipid peroxidation taking erythrocyte membrane as a model for assessing free radical induced oxidative damage and Na-K ATPase which is very susceptible to free radical were estimated in diabetic rats. High lipid peroxidation with low Na-K ATPase activity was observed, indicating membrane damage which may be responsible for hyperalgesia in diabetic rats.

P: 06

INFLUENCE OF AGE ON BLOOD PRESSURE IN FEMALE FIRST DEGREE RELATIVES OF HYPERTENSIVES

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Genetic, environmental variables and age have strong influence on BP in a person. A basal higher BP has been reported in first degree relative of hypertensives. Present study was the continuation of previous work done in females between 10-30 yrs age. Subjects of present study were healthy young female (30-40 yrs) among the general population of Delhi. They belonged to 2 categories - Group I - experimental group having one or more of the close relative with BP more than 140/85 mmHg (n=25) and group II - age and sex matched controls with no positive family history of essential hypertension (n=27). BP was recorded under basal conditions in sitting posture, during the same phase of menstrual cycle. Mean systolic and diastolic BP of the two groups were compared by applying students' 't' test. Mean systolic and diastolic BP were significantly higher in group I as compared to group II (p<0.01). Further, in 64% of subjects in group I SBP was more than 120 mmHg and DBP more than 80 mmHg whereas, in control group (group II), 14.8% of subjects had SBP and 7.4% had
DBP more than 120 mm and 80 mmHg respectively. In a previous study in females between 10-30 yrs, 17.5% of subjects who were close relatives of hypertensives had BP greater than 120/80 mmHg. Though the same population was not studied and the number of subjects in the present study is inadequate a rising trend in BP with age is observed indicating that the onset of hypertension is gradual.

In view of above mentioned finding, some measures in the form of change in "Life Styles", as regular physical exercise; attitudinal change, and diet may prove beneficial in close relatives of hypertensives, in preventing the onset of hypertension. These measures may also prove useful in others i.e. with no positive family history of hypertension against a rise in BP with advancing age.

P: 07: EFFECT OF DIESEL EXHAUST FUMES ON PULMONARY FUNCTION TEST

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The study was conducted on 27 Diesel engine automobile drivers (Group I) and compared with 30 controls of same socioeconomic status and age group but working in non air-polluted fields. (Group II). The pulmonary function tests were carried out using Microlab-3000 by Micro-Medical Ltd. The subjects were exposed to the tests before the actual recordings were made. There was a significant decrease in VC, FEV₁, FVC; F₁₀₂ and F₂₀. There was a decrease in PEF as well although it was just marginally significant. The decrease in the flow rates and the lung volumes suggests peripheral airway abnormality which possibly is due to the toxic effects of diesel exhaust. Out of the study group 9 smoker drivers who smoked more than 10 cigarettes per day and had a service period of more than 2 years formed Group III. The respiratory function studies on group III were compared with their counterpart (Group IV) in the control group who also smoked more than 10 cigarettes per day and also had a service period of more than 2 years. The lung volumes and flow rates in group III showed a further decrease as compared to the smoker control group (IV) thereby suggesting the additive effect of cigarette smoke and diesel exhaust fumes on the respiratory airway.

P: 08: EFFECT OF ACUTE STRESS ON STRUCTURAL AND FUNCTIONAL ASPECT OF SMALL INTESTINE OF RAT.

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Stress like protein caloric malnutrition and starvation has been known to affect the absorption of nutrients adversely due to alteration in mucosal morphology. A study was undertaken to find out whether the different duration of fasting produces structural or functional changes in small intestine. Further the turnover rates of mucosal cells differ from jejunum to ileum, the maximum at jejunum and minimum at ileal end. Hence the effect of starvation was studied on different segments of intestine. Adult albino rats were subjected to fasting for 48 hrs and 72 hrs. The intestinal transport of D-glucose was studied by an in vitro
sac technique. It was found that fasting for 72 hrs causes an overall increase in absorption of glucose, more significantly from distal ileum. Values being 30 ± 3 and 60 ± 5 Umol/gm dry wt/hr for controls and experimental group respectively. The histological studies made in this experiment show the flat mucosa and vacuolated cells revealing a completely different membrane profile in starvation. The increase in glucose absorption can well be explained firstly on the basis of a reduction in glucose metabolism during fasting and secondly due to utilization of other substrate like fat from which energy is derived for transport of glucose in ileum whereas in jejunum glucose as such is a substrate for its own transport.

P : 09

IMMUNOLOGICAL ENGINEERING IN DISEASE CONTROL

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Increased incidences of VACCINE FAILURE and drug RESISTANCE of microbes have prompted scientists to search for an alternative form of disease control. A bone marrow derived nonspecies specific, low mol.wt., heat stable cytokine (BIM), isolated in our laboratory, was found to upregulate suppressed immune system in stressed animals/birds. BIM was found to regulate lymphopoiesis and neutrophil phagocytic activity. It also had paracrine effect on thymus microenvironment and brain. Its secretion was found to be regulated by the autonomic nervous system. Field trial of BIM showed significant reduction in mortality and morbidity in broiler poultry exposed to Ranikhet/Gumboro viruses. In vitro human immature T cells showed blastogenic activity only in presence of BIM indicating a prospect of cytokine based immunomodulation in the treatment of immunosuppressive conditions.

P : 10:

THE EFFECTS OF NATRUM NURIATICUM - A HOMEOPATHIC DRUG ON PREMENSTRUAL SYMPTOMS.

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Evaluation of pre-menstrual symptoms was done in 50 healthy females (age 18-22 yrs). The subjects were instructed to record the body weight and presence and severity of their symptoms on the PMS calender daily. 60% subjects showed pre-menstrual symptoms pattern consistent with PMS. Cold-pressor test was preformed to study the autonomic function. 40% subjects were classified as hyper-reactors and 60% as normo-reactors. A significant difference in body weight, systolic pressure and pulse rate (p<.001) was observed between the post-menstrual and pre-menstrual phases, being on higher side in hyper-reactors. The most distressing symptoms reported were headache (67%, 11%), oedema over extremities (58%, 22%), leg cramps (58%, 28%), craving for sweets/salts (33%, 44%), anxiety (75%, 22%), poor concentration (75%, 33%), depression (58%, 22%) in hyper-reactors and normo-reactors respectively.
A homeopathic drug Natrum Murriaticum (Thirtieth Potency) was given sublingually for three consecutive cycles, 15 days prior to menstrual flow, as advised by an expert homeopath. Post-treatment observations were suggestive of a decreased sympathetic reaction and varying degrees of relief from disabling physical and emotional symptoms.

**P: 11**

**EFFECTS OF SHORT-TERM CIGARETTE SMOKING ON RESPONSE TIMES.**

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As response time is a simple means of determining sensory motor performance and alertness, the present project was undertaken to study the "Effects of short-term Cigarette Smoking on Response times". Visual Response Time (VRT), Auditory Response Time (ART) and Cutaneous Response Time (CRT) were studied in right-handed healthy male human volunteers comprising of 30 controls and 30 cigarette smokers using an Electronic Response analyser. Although response times were shorter in the smokers before smoking than control subjects, the difference is not statistically significant (P>0.05). However, immediately after smoking a cigarette of Goldflake Filter Brand, response times were significantly (statistically) shortened (P<0.05). Literature suggests that significant decrease in response times after smoking one cigarette could be due to the stimulant action of Nicotine on the central nervous system.

KEY WORDS: response times, visual, auditory and cutaneous stimuli, cigarette smokers, acute effect of smoking, simple motor tasks.

**P: 12**

**DICROTIC WAVE, BODY VOLUME & WEIGHT**

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Present study regarding the relationship of dicrotic wave on pulse tracing and anthropometry reveals a very interesting finding after statistical analysis. Dicrotism is related to the ratio of body weight and body volume. Lean body volume is hypothetically proportional to (Height) X (Chest Circumference)².

It was found that dicrotic wave disappears if this index is less than 45, and appears more frequently if index is more than 50.

**P: 13**

**CHOLINERGIC INVOLVEMENT IN THE ELICITATION OF SEIZURAL RESPONSE FROM AMYGDALA IN CATS.**

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Microinjections of carbachol in 2 ug dose in 0.5 ul saline was performed at 10 loci in basolateral and central nuclei in amygdala. Following infusion it was observed that within 2-
5 minutes the animals became alert and facial twitching with unilateral blinking of eyes was observed. This was followed by marked secretion of saliva and chewing of froth. The animal fell on the floor and developed a seizure. There was aimless pawing of floor with forepaws and deep breathing was observed. There was intermittent growling and the seizure response lasted for a period ranging up to a maximum of 24 hrs. During this period, the pupils were widely dilated and there was marked rigidity in all the four limbs. Initially the seizure was intermittent and the duration was 102 minutes. After about 30-60 minutes, the seizure became very intense and eventually the animal died. In order to check the involvement of muscarinic receptors, prior infusion of atropine sulphate in 5 ug dose was performed at 8 loci. Microinfusion of carbachol after one hour of atropine infusion in doses of 2, 5 and 10 ug at these loci failed to produce any seizure response. After the effect of atropine had waned off, microinfusion of carbachol in similar dose of 2 ug was again performed at these loci. It was observed that following microinjections of carbachol, similar seizureal response was observed, thus indicating the involvement of muscarinic cholinceptive mechanisms in the elicitation of seizures from amygdala. Microinjections of saline as control in similar volumes at these sites failed to produce any response.

P: 14  
**EFFECT OF GUANYLATE CYCLASE INHIBITORS ON NITRIC OXIDE INDUCED DIARRHOEA IN MOUSE.**

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The potential effect of nitric oxide (NO), a nonadrenergic noncholinergic inhibitory intestinal neurotransmitter has been observed on caeco-colonic region of mouse. The experiment was performed on a group of intra caecally cannulated mice. Profuse diarrhoea in all the experimental animals was noticed within half an hour after the introduction of freshly prepared acidified sodium nitrite (a nitric oxide donor) solution.

The intensity of diarrhoea was measured in terms of faecal output index (FOI) and the caeco-colonic transit time was assessed subsequently. Pretreatment with guanylate cyclase inhibitors: methylene blue and cystamine; a prostaglandin synthesis inhibitor: indomethacin and a chloride channel blocker: anthracene-9-carboxylic acid were found effective in preventing diarrhoea induced by NO.

The possible role of nitric oxide in causing diarrhoea is likely to be due to elevation of cGMP, and mediators of inflammatory reactions like prostaglandins leading perhaps to the opening of the chloride channels.
ROLE OF SUBICULUM IN OPERANT LEARNING: A MORPHOLOGICAL AND BEHAVIOURAL ASSESSMENT.
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Hippocampal formation plays a pivotal role in learning and memory. In the present study, female Wistar rats of 30 days were tested for retention of operant conditioning after electrolytic bilateral ventral subicular lesions. The animals were grouped under four categories: 1. Control 2. Trained 3. Lesioned 4. Sham. These animals were trained in the operant chamber on a continuous reinforcement schedule for 10 days prior to lesioning. The effect of lesion on this operant behaviour was also studied 10 days after lesioning. The behavioral analysis was done by comparing the pedal press rates of Trained, Sham, Lesioned rats from post lesion days. Morphological assessment was carried out by studying the dendritic branching points and intersections in golgi stained CA1 and CA3 pyramidal neurons of the hippocampus. In addition, numerical density of dendritic spines of CA3 pyramidal neurons were analyzed.

The behavioral analysis showed that pedal press rate of trained and Sham control group was higher than that of lesioned ( ). The quantitative analysis of dendritic morphology revealed a significant reduction of dendritic branching and intersections in lesioned rats of CA1 and CA3 apical as well as basal dendrites (P<0.001, 2-Way ANOVA; Scheffler's test) compared to other groups. In lesioned group numerical density of spines of CA3 neurons were significantly reduced (P<0.001) in different categories of both apical and basal dendrites of CA3 neurons. The study reveals that lesions of subiculum result in impairment of operant learning as well as structural changes in CA1 and CA3 neurons.

THE ROLE OF BLEOMYCIN AS AN ADJUVANT (CONCOMITANT) CHEMOTHERAPEUTIC AGENT IN ADVANCED INTRA ORAL CANCERS (STAGE III & IV)
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Advanced intraoral cancers continue to be an enigma in oncology. The magnitude that this problem assumes is in greater proportion in our country where the prevalence of intraoral cancers is high due to peculiar betel and tobacco chewing habit.

The late stages in which most of these patients present, with the frequent presence of metastatic cervical lymph nodes makes the prognosis dismal for these patients. Irradiation alone or in combination with surgery continues to give unsatisfactory results in these cases in contrast to the excellent survival rates in early stages. Chemotherapeutic drugs achieve high degree of palliation, without altering the poor survival rates. Recent strides in adjuvant chemotherapeutic approach to cancer initiated this study, to evaluate the merits and demerits of the different treatment modalities. The aim of the study was to evaluate the role
of Bleomycin as an adjuvant (concomitant) chemotherapeutic agent in advanced into oral carcinoma. The present prospective clinical study consisted of 50 previously untreated, advanced cases of squamous cell carcinoma of the oral cavity (Stage III and IV), at different anatomical sites (Buccal mucosa, tongue (anterior two thirds), lower gingivum, floor of mouth, upper gingivum, hard palate and lip) were registered, and histopathologically diagnosed. All these cases were divided by random allocation into two groups - Group A and Group B. Group A patients received conventional radiotherapy to primary tumor, draining regional lymphatics and lymph nodes with Cobalt - 60 teletherapy beam. Group B received identical radiotherapy procedures and injection Bleomycin in doses of 15mg intravenously twice weekly during radiotherapy and even in the post radiotherapy period up to maximum total dose of 210 mg. The rate of regression of primary tumor was faster in Group B (75 - 100% tumor shrinkage). 64% patients in group B had complete tumor regression in comparison to only 20% patients in group A. Recurrence rate in Group B was 4% at 10 weeks followup. Complications were observed but could be easily managed like skin changes, fever, stomatitis, respiratory symptoms, nausea and vomiting, fatigue and alopecia.

The concept of adjuvant chemotherapy appears very attractive. Bleomycin as an adjuvant to radiotherapy proved to be more effective in eradicating the disease and prolonging disease free survival period as compared to radiotherapy alone. However, the results are only of short term duration.

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ELECTROCARDIOGRAPHIC CHANGES IN HUMAN SUBJECTS DURING ANTARCTIC SUMMER: GEOMAGNETIC EFFECT
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There are evidences to show that the artificial electromagnetic field affects the electrical activity of heart in human subjects. However the effect of natural geomagnetic field (GMF) on human ECG are not known. Thus a study was conducted on the south pole (Antarctica) where the GMF is high with perturbations in the form of magnetic storms. Nineteen healthy adult males (age 28 to 38 years), all members of the 14th Indian expedition were volunteers for the study. Twelve lead ECG recording was done during voyage, after eight weeks of stay in Antarctica, during magnetic storms (n = 6) and after oral administration of beta blocker (Atenolol - 100 mg) during magnetic storms. The GMF was monitored using digital induction magnetometer. The results exhibited no significant changes in ECG pattern after 8 weeks of summer stay in Antarctica, except slight tachycardia (73 to 78), decreased QT interval (0.37 to 0.35) and mean electrical axis (MEA) deviation of 4.4 degrees towards left. Whereas during magnetic storms there was a significant (p < 0.001) increase in P-wave amplitude (0.10 to 0.16) along with mild increase in RR-interval (0.78 to 0.80), QT-interval (0.44 to 0.48) and MEA deviation of 7.8 degree towards left. Atenolol administration further increased the RR (0.80 to 0.90) and QT (0.43 to 0.52) intervals, but reversed the MEA by 3.6 degrees (right). Thus we conclude that GMF perturbation altered the myocardial conductivity which was not blocked by beta blocker. Therefore we hypothesise that the effect of GMF on myocardium may not be a centrally mediated response involving suprachiasmatic melatonin pathway.

(Late Arrival)