RESTRICTURING CURRICULUM - AN EXPERIENCE
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With the explosion of biomedical knowledge and technology, curriculum reforms have to be directed to limit the boundaries of the subject matter in basic sciences to all relevant underlying knowledge necessary to comprehend the diseases and their management. Assumption that all the knowledge will be remembered and transferred to the clinical situation is not well founded. It is also pertinent that learning experiences should aim at promoting independent learning and problem solving skills of the students. Appropriate evaluation methods need to be designed to assess the various cognitive and psychomotor abilities of the students. Restructuring and implementing a relevant, "student-centred" curriculum demands change in the attitudes of both the teachers and students and involves long term commitment on the part of the institution. Our experience in changing the evaluation pattern shows initial impact in this direction.

DIHYDROPYRIDINE GROUP OF CALCIUM CHANNEL ANTAGONIST IN EPILEPSY?
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Effects were studied of intraperitoneally administered calcium channel blocker nifedipine (NIF) 5mg/Kg. and diphenyl-hydantoin (DPH) 5mg/Kg. on hippocampal kindling and maximum electroshock thresholds (MEST) (6 rats each). All the NIF injected rats showed complete suppression of behavioral seizure after the 3rd injection. Four of the 6 DPH rats had increased epileptic activity for two days and 2 others - absence of Grade 5 seizure after the 5th DPH injection. However all 6 showed partial seizure suppression subsequently. Neither NIF nor DPH suppressed after discharge. MEST were not affected by NIF although DPH showed suppression of posterior limb extensor tone in all the 6 rats.
It is now well known that impulses from J receptors (also called pulmonary C-fibres) produce reflexly tachypnoea, bronchoconstriction and laryngeal constriction in various animals and in man. It is also known that they produce dyspnoea in man. Finally, although it has been known that they also cause the J reflex (i.e. reflex inhibition of somatic muscles) it is now clear that this reflex manifests itself as a feeling of muscle weakness in man. The J reflex is a life saving reflex at high altitudes as it prevents high altitude pulmonary oedema (HAPO). Evidence will be presented to show that dry cough, breathlessness and muscle weakness need to be recognized as a cardinal triad at high altitudes that can be particularly useful for preventing HAPO. The triad can also be of value in several pathophysiological conditions such as left ventricular failure.
LIPOSOMES TECHNOLOGY
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Liposomes are phospholipid vesicles where lipids are arranged in a concentric bilayer enclosing an aqueous space. Water soluble material can be accommodated in the aqueous space of liposomes whereas lipophilic substances get associated in the lipid part. Liposomal size and charge could be varied according to the requirement. The initial studies of liposome were mainly confined to its use as a model membrane system in the elucidation of the role of various cell surface molecules, their transport and interaction with various ligands. With the progress of time, liposomes have gained importance as vehicles for delivery of drugs and biomolecules to a desire site in the living system. The recent interest on liposome research is its use as immunological carrier and as an adjuvant. Liposomes have also found their use in immunodiagnostics andingenetic engineering.

In this particular lecture I will cover various application of liposomes and also the contribution which my group made during my research career at the Christian Medical College Vellore, Indian Institute of Chemical Biology at Calcutta and Liposome Research Centre, University of Delhi South Campus, New Delhi.

Abstract Form

CARBON MONOXIDE OXYGEN AND CELL FUNCTION
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The air we breathe is the only source of oxygen for our metabolic need. But the polluted air is the major source of carbon monoxide which competes with oxygen for many oxygen-dependent cell functions; e.g. oxygen transport, hydroxylation, oxidative metabolism and so on. Accordingly, carbon monoxide can impair cell functions which use oxygen. It is usually the heme protein molecules which bind or react with oxygen, and carbon monoxide can replace oxygen, depending upon their respective affinities. Because of these specific properties, carbon monoxide can also be used as a probe to test the role of these chromophore molecules, for example in oxygen chemoreception. The results of such studies on carotid body will be the focus of this presentation.
Toxic side effects resulting from the administration of therapeutic agents often complicate successful therapy in a number of diseases. These adverse side reactions possibly arise due to the fact that, at therapeutically effective concentrations in the blood, the non-target cells in the body are also exposed to the cytotoxic effects of the drugs. It is probable that such side effects could be minimized if a modality of delivering drugs could be worked out which would: (i) minimize the uptake of the drugs by non-target cells, (ii) selectively deliver the drug only to the target cells at relatively low concentrations in the blood, and (iii) ensure efficient intracellular availability of the drug. As macrophages are affected in a large number of viral, bacterial, fungal, protozoal, metabolic and neoplastic diseases, we have demonstrated the feasibility of a novel approach for delivering drugs selectively to these cells. For this purpose, we have exploited the exquisite cell-type specificity and high efficiency of the process of receptor-mediated endocytosis of macromolecules. Our approach consists of chemical coupling of an appropriate drug to a carrier molecule, viz., maleylated bovine serum albumin (MBSA), which is recognised by receptors present exclusively on cells of the macrophage lineage. We have shown that such drug conjugates bind with high affinity to the receptors on the macrophage surface leading to rapid internalization and subsequent degradation of the ligand in the lysosomes, releasing a pharmacologically active form of the drug. So far we have tested the efficacy of this approach in cell culture and/or animal models of macrophage-associated disorders of protozoal (leishmaniasis), bacterial (tuberculosis) and neoplastic etiology. In all three instances examined, the conjugated drug was nearly 100-fold as effective as the free drug. These results indicate that the receptor-mediated modality of delivering drugs to macrophages could contribute to greater therapeutic efficacy and minimization of toxic side effects of drugs used in the management of intracellular infections as well as neoplastic diseases. MBSA-mediated delivery of various agents provides a generalized tool for manipulating the metabolic activity of macrophages for a variety of purposes as well as for reduction of toxicities of various chemotherapeutic agents.
LOW DOSE RADIATION AND BIOLOGICAL EFFECTS
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Life on earth has developed with an ever present background of radiation. It is nothing new and has always been there. What is new is the extra man-made radiations being used in the hospitals; or fall out from nuclear weapons or from nuclear plants built to generate electricity.

Major cause of radiation injury at high doses is thought to result from the production of free radicals. It has been shown that free radical scavengers increase after low dose radiation possibly to a greater extent than necessary to neutralise the radicals produced by radiation. This increased production of scavengers might increase cell defences against free radicals that result from exposure to other environmental mutagens or those produced by normal oxidative metabolism.

Recent studies have shown that a small dose of radiation used as a primer enhances the cells or tissues capacity to withstand a higher dose of radiation. Results also indicate that following radiation there is a depression in the activity of thymidine kinase and the recovery takes place in 6 hours. However, if radiation dose is repeated, the recovery takes place in only 2 hours.

Recent studies in this area will be discussed.

Microneurographic analysis of sympathetic nerve activity during sleep in humans
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The purpose of the present study was to clarify how the sympathetic nerve activity became modified during sleep in humans. Subjects were 14 healthy volunteers. Muscle sympathetic nerve activity (MSNA) was recorded from the tibial nerve during nocturnal sleep using a microneurographic technique with simultaneous polysomnographic recording. 1. MSNA became suppressed during non-REM sleep in proportion to the depth of sleep stage. 2. During stage 2, the MSNA was often associated with EEG K-complex. 3. Sleep apnea seen in the elderly subjects during non-REM sleep was associated with an enhancement of MSNA and an elevation of systemic blood pressure. 4. During REM sleep, the MSNA became increased to the level as in awake state. The MSNA was higher during phasic REM period than during tonic REM period. In conclusion, the sympathetic outflow to muscle is modulated according to sleep stages. Sleep apnea is associated with an enhancement of sympathetic outflow to muscle to elevate systemic blood pressure.
CIRCADIAN RHYTHM ALTERATIONS IN ANTARCTICA
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Human subjects staying in Antarctica (Ant) during polar summer show alteration in circadian rhythmicity (CR). To determine the direction and degree of alteration in CR in Ant a study was conducted during 10th and 11th Ant Expedition at Maitri Station (70°S) on human subjects. Rhythms of oral temperature, blood pressure (BP), heart rate (HR), skin temperature, blood flow, and galvanic resistance (GSR), anterior pituitary and thyroid hormones, sleep-awake cycles were studied. Four sets of physiological and three sets of blood samples were obtained at 4 hourly intervals for 24 hrs, spaced at 4 weekly intervals during 12 weeks of study. The body temperature, diastolic BP, GSR and HR showed a phase delay with significant alterations in levels of growth hormone, prolactin and TSH. The results indicate that synchronization action of light on CR of physiological functions is altered in Ant. and probably through participation of anterior pituitary hormones.

PHYSIOLOGICAL RESPONSES DURING 10 WEEKS SOJOURN IN EXTREME ARCTIC COLD ENVIRONMENT

Cold acclimatization in men is still a debateable matter, some group holding an affirmative opinion while the other group negating it. There is hardly any study on the physiological responses of tropical men from low latitude country like India, during sojourn at the arctic region. These aspects were studied on 10 healthy men (20-30 years age) by monitoring various physiological responses initially at Delhi, thereafter during 10 weeks stay at the arctic region of Russia (70°N 38°E) at the winter period, and again on return to Delhi. Their responses at the arctic were compared with those of 6 Russian migrants (RM) and 6 Russian natives (RN) of the arctic region. Physiological responses studied include the autonomic profile, cardiorespiratory functions, biorhythm, sleep, thermoregulatory efficiency, cold induced vasodilatation, cerebral activity (EEG and Evoked potentials), physical and mental performance. The study has revealed many interesting findings with regard to the problem of transmigration of men from tropical to arctic environment. Salient findings will be discussed.
Emotions have developed through natural selection and provide information which guides the behavior of the organism. Brain mechanisms have evolved to produce these emotional states and some of these mechanisms also mediate gut reactions. Neurobehavioral research has implicated the limbic system in emotional responses and also in gut function. Stress ulcers are now recognized as an emotional/visceral response to the stressor and complex neurochemical mechanisms are involved. The limbic system, with its rich interconnections, plays a crucial role in regulating the organism's response to stress. The amygdaloid complex and anterior cingulate cortex are two areas which are seemingly crucial in such responses. Lesions in these areas attenuate stress ulcers, whereas, electrical stimulations induce gastric lesions. Peripheral injections of benzodiazepines (BZD) inhibit such experimental ulcers in an antagonist dependent manner. These effects are replicated after intra-amygdalar or intra-cortical applications of BZD's and GABA to stressed rats. It is suggested that the ability of the organism to cope with environmental/emotional stressors and the resultant visceral (gut) reactions is regulated by the CNS and the BZD-GABA supramolecular receptor complexes in these limbic structures are crucial for such brain-gut interactions.
Abs. No. P7NA 01

SERUM IRON, TOTAL IRON BINDING CAPACITY, HAEMOGLOBIN AND PERCENT IRON SATURATION OF TRANSFERRIN, A STUDY IN PREGNANCY AND POST PARTUM PERIOD.

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The study presents a composite picture of Hb, SI, TIBC and percent iron saturation of transferrin in different stages in pregnancy and post partum period and results correlated with age and parity. In pregnant subjects 64% had Hb less than 10g/dl. Signs of increased iron demand, increased iron turnover, obvious iron deficiency were demonstrated throughout the pregnancy by decrease in Hb, SI percent iron saturation of transferrin and increased TIBC, especially in older age group and multi gravidae.

Abs. No. P7NA 02

INCIDENCE OF "JUVENILE T WAVE" IN HEALTHY YOUNG MALES.

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The inverted T-wave in V1 Chest lead, a normal finding in e.c.g. in infancy and childhood, when appears in second decade of life becomes an important finding in which the heart diseases have to be ruled out critically before labelling it as Juvenile.

20 Healthy male medical students of the age group 17 to 25 years were selected. Careful history was taken and thorough physical examination was carried out to rule out different causes of inverted T-wave. The complete e.c.g was recorded and 35% were found to be having juvenile T-wave. The results were tabulated and analyzed statistically.
SERUM LEVEL OF IRON AND TRANSFERRIN IN NORMAL AND ANAEMIC WOMEN

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Eighty nine women in their I, II & III trimester of pregnancy were selected for the estimation of serum level of iron, transferrin, percent saturation of total iron binding capacity (TIBC) and latent iron binding capacity. Subjects with associated infective, metabolic or degenerative diseases were excluded. The women were divided according to severity of anaemia into normal, mild & severe. In severe anaemic group serum iron and transferrin level were significantly lower in I & III trimesters. Percent saturation of transferrin with serum iron was low in I trimester in normal pregnant women. A further significant fall was noted in mild and severe anaemia, leaving a vast latent iron binding capacity, indicating an inherent poor store in the body, which was identified to dietary deficiency. Grateful acknowledgment is made to Roussel Scientific Institute India for financial assistance.

CHANGES IN ARTERIAL BLOOD PRESSURE DURING TRACTION OF EXTRAOCULAR MUSCLES:

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Changes in mean arterial pressure (MAP) during traction of extraocular muscles were studied in rabbits. A significant reflex fall in MAP was observed, which could be abolished only by retrobulbar block and not by vagotomy, intravenous atropine or glycopyrronium, suggesting that it is distinct and independent of, the oculocardiac reflex (OCR). We suggest that these reflex changes in blood pressure be known as the 'oculodepressor reflex' (ODR).
ISCHEMIC PRECONDITIONING LIMITS THE INFARCT SIZE IN RABBIT'S HEART

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We have undertaken this study to assess the role of preconditioning on limiting infarct size and also to test the beneficial effect, if any, of addition of Lidocaine to preconditioning. The Group I (n=6) served as control in which ischemia was produced by occlusion of a branch of left coronary artery for 30mts followed by 3 hours of reperfusion. In group II (n=6), heart was preconditioned by 2 five minutes short occlusions followed by 15 minutes reperfusion and then Ischemia was produced as in Group I. Group 3 (n=6) received a bolus dose of Lidocaine (2mg/kg) before preconditioning which was followed by production of Ischemia as in Group I. Ischemia region was measured by post mortem infusion of fluorescent particles and the volume of infarct was determined by incubating serial slices in triphenyl tetrazolium. In control group 40.50±3.23 of the ischemic zone infarcted with preconditioning 30.05±1.56 infarcted and with Lidocaine and preconditioning 29.85±1.62 infarcted. Data obtained indicates that preconditioning of heart has significantly reduced infarct size compared to control group. Addition of Lidocaine has no significant effect in limiting infarct size.

ATTENUATION OF BLOOD PRESSURE AND HEART RATE RESPONSES DURING CORONARY ARTERY OCCLUSION

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Different doses of Phenylephrine and Sodium nitroprusside were injected (i.v.) and reflex changes in blood pressure (BP) heart rate (HR) were recorded during acute occlusion of LAD coronary artery in anaesthetized, artificially ventilated dogs. It was observed that a progressive reduction in BP and HR responses occurs with the time of occlusion of LAD for similar doses of Phenylephrine and Sodium nitroprusside. Although the baseline HR increased considerably, the dose response relationship was attenuated following occlusion. The sensitivities of baroreflex tachycardia and bradycardia were also reduced considerably. The efferent pathway operating through vagi play a significant role during myocardial ischemia induced by coronary occlusion.
"DIFFERENCE IN RETICULOCYTE COUNT VARIATION IN MALES & FEMALES
AJIT BHATTACHARYA* (a two year study)"
Dept of Physiology, Christian Medical College, Ludhiana.
A 5 fold variation (0.8 to 4.1%) in the reticulocyte count in adults with females showing more variability, seems to have been established from random samples. We have found considerable variations in the same individual (3 fold or more) when estimated at different times of the year. Reticulocyte Count is being done each year in 50 medical students for the last 5 years & data for two successive years is presented here. The lowest values are observed in the months of November & January. The peak values in June are 2-2.5 times higher than those of November & the values in April & June are significantly higher than those of November in both males & females. There is 20-25% variation in the peak values between the two years. The females show more variations but those variations are not significant. Marked cutaneous vasodilation in dry summer & consequent discrepancy between the vascular bed & blood volume may have resulted in increased erythropoiesis mediated by volume receptors.

ACCLIMATISATION AND THE CARDIOVASCULAR RESPONSES TO COLD-IMMERSION AFTER SHORT AND PROLONGED STAY IN ANTARCTICA
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Antarctica, the coldest continent, has a temperature of 8°C to -10°C and a wind-speed of average 25 knots/hour in summer. We studied the effects of Cold Immersion and the Pain Threshold Time (PTT) in people exposed to Antarctic environment for a short period (Short Stay or SS, n=9) of 8 weeks and for a prolonged period (Prolonged Stay or PS, n=9) of 14 months. ECG, Galvanic Skin Resistance (GSR), Blood-pressure (BP) were recorded just before, during and after immersion of right hand in intermittently stirred waterbath filled with water at 4°C. This was done at baseline, after exposure to Antarctic environment (AE) and after return from Antarctica. Results show a gradual diminution of pressor response (6.22 mmHg vs 0.25 and 2.44 mmHg in systolic BP for SS and PS respectively) and reversal of GSR response after AE. PTT increased from 134.5 ±122.66 to 322.25±98.87 seconds after SS which was comparable to that of 331.87±74.41 seconds after PS. Basal heart rate did not change significantly though the heart rate response gradually waned. Four weeks after departure from Antarctica the reversal of PTT was complete in subjects of SS unlike those of PS. It is apparent that both SS and PS leads to a diminution of cardiovascular sympathetic reactivity.
RESPONSE VARIABILITY TO STIMULUS VARIABLES DURING VALSALVA MANOEUVRE
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Some cases of cerebellar ataxics cannot perform standard Valsalva manoeuvre (VM). This prompted us to investigate the response variability to stimulus variables (varying effort levels) during VM. The findings may tell whether the test will be valid at lower effort levels or not. Each of 16 healthy volunteers performed VM for 16 times which resulted 256 records of VM. The analysis of records suggested that Valsalva ratio (VR) rises linearly only for 10 sec. period holding of intrathoracic pressure (ITP) from 20 mmHg to 40 mmHg. The slope of curve was 0.15/10 mmHg. The max HR (phase II), min HR (Phase IV) and their difference showed linear changes from 20 to 30 mmHg for 10 sec. period. The R-R interval difference for per unit changes in ITP showed linear fall for 5 & 10 sec. period from 20 to 40 mmHg. These results suggest that VM can be performed at lower effort levels (30 mm Hg for 10 sec.) and standard VR can be computed from VR derived from VM at lower effort levels. Difference in R-R/unit change in ITP appears to be more sensitive expression of Valsalva response.

CARDIOVASCULAR EFFECTS OF ACUTE AUDITORY STRESS

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Certain cardiovascular effects of Acute Noise stress was studied in albino rats. High intensity sine wave noise of more than 100dB for 30 min. was used as the stress stimulus. Exposure to noise caused a significant raise in Mean arterial pressure and pulse volume. Where as the cardiac output was decreased significantly and there was no significant alterations in the Electrocardiographic events.

Abs. No. P7NA 09

Abs. No. P7NA 10
Effects of various types of exercise training on cardio-respiratory efficiency in humans.

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60 normal young healthy adults were taken as subjects. They were non-smokers and disease-free. Cardio respiratory tests were done on them in the morning 2 hours after breakfast. They were trained in various types of exercises for a period of 12 weeks. These tests were repeated after training. The results were compared and statistical significance was analysed. The tests which are statistically significant have been discussed and it has been observed that whole body exercise training is best suited to the individuals. They have maximum beneficial effects on increasing the cardiorespiratory efficiency of the subjects. Walking and combined limb exercises are the next best and lower limb or upper limb exercise training follow them.

Abs. No. P7NA 12

Dose response effects of cadmium on serum sialic acid, \( \alpha_1 \)-acid glycoprotein and protein-bound hexose levels in rats


Acute exposure with cadmium elevates serum levels of sialoglycoconjugates and sialic acid levels in different serum fractions. In the present study rats were challenged with 0.5, 1, 2 or 3 mg cadmium/kg, i.p. to determine whether these changes are dose related. Dose dependent increase was found in the levels of serum total sialic acid (TSA), perchloric acid (PCA)-soluble sialic acid (PSA), lipid-bound sialic acid (L-BSA) and free sialic acid (FSA) 48 hrs post cadmium administration. Similarly, it also exhibited a dose related increase in the levels of serum PCA-soluble proteins, \( \alpha_1 \)-acid glycoprotein and protein bound hexose after the metal exposure. The maximum increase was found at 3 mg cadmium dose for all these parameters and it ranged from 38.6% in protein-bound hexose to 336% in LBSA. The levels of PSA, \( \alpha_1 \)-acid glycoprotein and PCA-soluble proteins in serum might be useful as biomarkers for staging or monitoring cadmium toxicity.
NEUROPHYSIOLOGICAL MECHANISM OF THE DETERIORATION IN MENTAL FUNCTIONS UNDER HEAT STRESS

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Heat stress, both hot dry and hot humid, results in decline of mental performance including cognitive and non-cognitive functions. The neurophysiological mechanism underlying the deterioration in these functions under heat stress has not been clearly demonstrated. In the present study an attempt has been made to evaluate the neurophysiological role in the deterioration of mental functions under heat stress.

Mental performance, both cognitive and non-cognitive functions were studied in 16 subjects prior to, during and after 3 hour exposure to hot dry (DB 45°C+1°C, RH30%) and hot humid (DB 39°C+1°C, RH60%). The nerve conduction velocity (both sensory and motor) and auditory brainstem response (ABR) were recorded before and after the exposure.

Both cognitive and non-cognitive psychological variables were significantly lower under hot dry and hot humid conditions, the deterioration being relatively of higher degree in the hot humid condition. On the other hand, sensory threshold and nerve conduction velocity of sensory and motor nerve were not affected. The ABR, on the other hand, showed a marginal delay in Wave I and III which is more appreciable under dry heat condition. These findings suggest that heat stress affects primarily the central processing system (CNS) rather than the afferent and efferent conduction pathways thereby leading to deterioration in mental performance.

COLD-INDUCED VASODILATATION AND PERIPHERAL BLOOD FLOW UNDER LOCAL COLD STRESS IN TROPICAL MEN AT ARCTIC

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Peripheral vascular response to local cold stress was studied on 4 groups of volunteers by eliciting cold-induced vasodilatation (CIVD) response during immersion of the right hand in cold water (4°C) for 30 min, to evaluate whether tropical men can get acclimatized to local cold compared to temperate zone people during arctic cold exposure. Group A and B (10 each) were drawn from tropical region (India). Initial study was conducted on control Group A at Delhi. Group B was airlifted to arctic (70°N, 38°E) where measurements were done on them during seventh week of acclimatization, then they were flown back to Delhi and retested. For comparison, study was done at arctic on 6 migrants (Gp C) from temperate zone of Russia and 6 natives (Gp D) of arctic. The peripheral blood flow under local cold stress was calculated. There was a significant improvement of CIVD response and peripheral blood flow in tropical men due to acclimatization to arctic environment which is similar to those of the migrants but lower than natives. Thus local cold acclimatization is possible even in tropical men similar to those of the temperate zone people.
MEDICALCARE, EMBRYOGENESIS FOR QUALITY HUMAN RESOURCES.


Hereditary defective Gene transmit congenital abnormal consumers - generation. DOPY - Drugs, AIDS and others END0 - EXO factors having abberation on reproductive stages, detection by Ultra-Sonography, Aminiocentesis, Fetoscopy Chorion - Villous - Biopsy etc. Pregnancy should be terminated in those cases. A Massive Communication by Media Govt. & all Philanthropic people and organisation — put India a Healthy Nation in 2000 A.D.

DOES COLD DECREASE PHYSICAL ACTIVITY IN ANTARCTICA?

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Previously we have reported that men during their stay in Antarctica (ANT) showed decrease in physical performance but the mechanism of this has not been investigated. To determine the role of cold acclimatization (CA) as the causative factor for reducing the physical performance the present study was conducted on rats. The activity of the seven adult rats was recorded by the Activity Movement Monitor (E611). Five days of control activity was monitored at Ta 26±2 c and then the rats were acclimatized at 4±2 c for 10 days. After CA the activity for five more days was monitored at 4 c. The results indicate that at Ta 26±2 c both small and large movements initially increased (196% and 302% respectively) and then gradually settled down to a decreased activity range of 73 to 82% in small and 39 to 63% in large movements. Whereas after 10 days of CA, there was a marked decrease in the small as well as large movements (167% and 834% respectively) which persisted for the next five days (167 to 232% for the small and 834 to 2231% for the large movements). Thus the study suggests that CA in rats resulted in increased motor activity. Therefore, this finding is contradictory to our previous results of reduced physical performance in human subjects at Ant. cold. So, the possibility of hormonal, or phase shift in circadian rhythms, or psychological alterations resulting from the adaptation to environment as the causative factors can not be ruled out.
EFFECT OF SIMULATED HIGH ALTITUDE ON TASTE BEHAVIOUR IN MALE RATS

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High altitude exposure has been associated with the problem of Hypophagia/anorexia which is one of the problems encountered by sojourners at high altitude. Very little is known about the factors or the pathophysiology underlying the problem of hypophagia. One of the factors leading to hypophagia may be the change in sensitivity of the taste receptors leading to decreased food intake. In the present study the gustatory responses were assessed in rats exposed to a simulated altitude of 25,000 feet (7620 m) for 6 hrs daily and continuously for 21 days. The test solutions used were: saccharin 0.2%, citric acid 0.16%, sodium chloride 0.9%, quinine sulphate 0.001% and tap water. The solutions were given one hour after the termination of hypoxic exposure every day. Only one test solution was administered each day. The 24 hr food intake and water intake, body weight every third day and blood sugar and blood insulin every week were recorded before, during and after exposure to hypoxia. Hypoxia produced an increase in intake of saccharin, citric acid, sodium chloride and quinine sulphate as compared to the control unexposed rats. The 24 hr food and water intake and body weight registered a decrease while blood sugar reflected a state of mild hyperglycemia. The altered intake of test solutions in rats exposed to hypoxia suggests the possibility of altered sensitivity of taste buds to different taste modalities.

AGE RELATED CHANGES IN THE ACTIVITY OF GLYOXALASE SYSTEM

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Glyoxalase system was shown to play a vital role in several biological processes like cell division and growth. However, its involvement in ageing is not known. Therefore we have studied the activities of glyoxalase I (G1) and glyoxalase II (GII) in various age groups of male Swiss albino mice (1-25 months). Our findings indicate that the activities of G1 and GII increased during growth phase and decreased with increase in old age. In prenatal period the activity of G1 was remarkably high whereas the activity of GII was very low.
EFFECT OF LOW LEVEL AMPLITUDE MODULATED RADIOFREQUENCY RADIATION ON CENTRAL CHOLINERGIC SYSTEM OF DEVELOPING RAT.
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We examined the effect of long-term exposure to radiofrequency radiation 147 MHz and its sub-harmonics 73.5 and 36.75 MHz amplitude modulated at 16 and 76 Hz on cholinergic system of developing rat brain. A significant decrease in acetylcholine esterase (AChE) activity was found in exposed rats as compared to the control. Decrease in AChE activity was independent of carrier wave frequencies. A short-term exposure did not have any significant effect on AChE activity.

CHANGES IN DEFENSIVE ENZYMES AND METABOLITES IN AGEING ERYTHROCYTES OF DIABETIC RATS
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The ageing of erythrocytes shows many physical and biochemical changes. Changes in CAT, GST, GSH and GSSG were observed in ageing erythrocytes of diabetic rats (D) and its treatment with insulin. The fractionation of different age groups (Young, middle-aged and old cells) of erythrocytes was performed on percoll gradient and were confirmed by measuring glycosylated hemoglobin. The levels of CAT, GST, GSH and GSSG increased from young to old cells in controls whereas diabetes showed a decrease in CAT and GSH levels, and an increase in GSSG, an increase in GST in young cells with no change in middle-aged cells and a decline in old cells was also found. Insulin therapy resulted in further decrease in the CAT, reversed GSH and also GST in middle and old cells but could not reverse GSSG levels. It may be concluded that erythrocytes show an early destruction of defensive system which may lead to shorter life-span of erythrocytes in a diabetic condition.
**Abs. No. P7NB 09**

**DROWNING AND NEAR DROWNING PHYSIOPATHOLOGY : CHANGING TRENDS**

**ABSTRACT**

Forensic medicine definition of drowning as an "Asphyxial death" due to submersion, differs from most other forms of asphyxial deaths. Looking at the types of drowning this earlier definition is by no means adequate. "Asphyxia with Pulmonary flooding", where water enters the lungs is considered.

Fresh water drowning vis a vis sea water drowning mechanics and major findings in human beings, immersion syndrome and delayed drowning, supportive therapy with drugs and fluids with electrolyte are evaluated.

By

(DR. SURJIT SINGH)

**Abs. No. P7NB 10**

**EFFECT OF EMF ON CIRCULATING TESTOSTERONE LEVELS IN RATS**

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and School of Environment Sci., JNU, New Delhi

Electromagnetic field (EMF) effect on the nervous, cardiovascular, hematological and the reproductive systems are suggested to be non-specific stress responses. The present report is the outcome of the investigations to determine the relationship between the various doses electromagnetic field exposure and mammalian endocrine system with special reference to male reproductive hormone viz testosterone. Chronic exposure (23 hr/day for 60 days) of extremely low frequency (50 Hz) and microwave (1.0 mm/sq 2 for 60 days) electric field to different groups of rats were applied. A corresponding group of animals, maintained under identical conditions except for the application of the EMF served as controls. Serum testosterone was estimated by radioimmunoassay in both the groups. The preliminary results suggest a significant decrease in plasma testosterone levels in extremely low frequency (50 Hz) group to (0.59 ± 0.40 n mol/L) as compared to controls (2.4 ± 1.16 n mol/L); whereas in microwave exposed rats there was no significant effect on the testosterone levels. The results are indicative of a more specific effects produced by chronic prolonged exposure to extremely low frequency electromagnetic field.
INFRAADDITIVE DIURETIC EFFICACY OF CONCURRENT AMINOPHYLLINE AND FRUSEMIDE
S.K. TONGIA, S.P. DHANERIA & P. NYATI,
Department of Pharmacology,
M.G.M. Medical College, Indore (M.P.) INDIA

Male albino rats weighing between 150-225 gm. fasted over night but freed having water ad libitum were used to assess the diuretic efficacy of intramuscular aminophylline and frusemide separately and concurrently after intraperitoneal 10 ml. of distilled water loading. The normal rate of diuretic weight loss was less augmented by aminophylline and more augmented by frusemide. The diuretic response was more by the concurrent intramuscular administration of aminophylline and frusemide in comparison with that due to either drug alone. However the observed diuretic response of the two drugs administered concurrently was lesser (infraadditive) than the sum of the individual diuretic response (additive).

MICROWAVE POWER ABSORPTION DIFFERENCES IN NORMAL AND MALIGNANT BREAST TISSUE
KHALLARE BEENA AND BEHARI J.
S.E.S., Jawaharlal Nehru University, New Delhi.

As radio frequency induced hyperthermia is considered to be the modality in cancer treatment, it is important to determine the induced electromagnetic fields which generates the nonthermal response and investigates the temperature at which the thermal effect appears. In the present investigation the tensor equation method developed by Livesay, D.E. and Chen, K.M. (1974) has been used to compute induced fields in normal and malignant breast tissue at microwave frequency (100 MHZ) polarized in X-direction. It is found that microwave power absorption in normal tissue is at least an order of magnitude higher than that in carcinoma.
**Abs. No. S8FC 02**

**Regulation of Ca\(^{2+}\) Channels in Skeletal Muscle T-Tubules: A New Approach**

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Benito Juarez Road, New Delhi - 110 021

Ca\(^{2+}\) channels in skeletal muscle transverse tubules have been studied extensively as a model Ca\(^{2+}\) channel. It is known to be regulated by G-proteins as well as by reversible phosphorylation. However, there is significant difference of opinion as to which mode dominates in reality to regulate the channel. We have observed existence of a calmodulin-dependent kinase which can phosphorylate \(\alpha\) subunits of the Ca\(^{2+}\) channel. The Kinase activity resides in the same membrane preparation. We propose a possibility of regulation of ion channels through channel-associated specific kinases. Implications of such a mechanism to unite two apparently distinct concepts in ion channel regulation will be discussed.

**Abs. No. S8FC 03**

**CLONING AND CHARACTERISATION OF A CALCIUM BINDING PROTEIN GENE FROM ENTAMOEBA HISTOLYTICA**

J. Prasad, S. Bhattacharya & Alok Bhattacharya *

School of Life Sciences, Jawaharlal Nehru University, New Delhi-110067.

The protozoan parasite Entamoeba histolytica is the etiological agent of amoebiasis, a common parasitic infection of developing countries. Molecular mechanisms responsible for pathogenesis are not yet known. Ca is thought to trigger invasion of epithelial cells by release of hydrolytic enzyme collagenase through calmodulin, a Ca-modulated protein. Though the molecular mechanisms of Ca-dependent functions are not known in E. histolytica, it is known to regulate a number of functions including motility, cell division, secretion, stimuli to environmental stress, etc. in many eukaryotic cells. A gene encoding a CaBP was identified from a cDNA expression library of E. histolytica in 1991. Subcloning and sequencing followed by a homology search showed a low but significant percentage of homology (30%) to all known calmodulins. Sequencing of a genomic fragment revealed a complete ORF of 402 bp encoding a protein of 134 amino acids. The deduced protein had four highly conserved Ca-binding domains and was related to the EF-hand family of Ca-binding proteins. The putative transcriptional start site was also deduced from previous data. The cDNA was expressed as a fusion protein, in the expression vector pMAL-c. The recombinant protein bound radioactive Ca\(^{2+}\). Northern and Southern analysis showed the presence of a transcript of 0.54 kb from a single copy gene. The complete gene was cloned into an expression vector, PET 3c. As expected the recombinant molecule also bound calcium. The role and immunogenicity of the protein will be discussed.
Abs. No. S8FC 04

ADVERSE DRUG REACTIONS TO RANITIDINE.
K. C. SINGHAL,
DEPT. OF PHARMACOLOGY, JN MEDICAL COLLEGE, AMU, ALIGARH-2

The study was undertaken to assess the ADR profile of ranitidine in short term treatment of duodenal ulcer. 850 patients with endoscopically or radiologically diagnosed duodenal ulcer, including patients attending OPD & admitted to JNMC Hospital, were allocated to treatment with ranitidine, either 150 mg twice daily or 300 mg as a single night time dose for 4 weeks. The patients were given thorough clinical check up and relevant investigations were carried out. Possible drug ADR relationship were evaluated taking care of patients background symptoms. Overall the incidence of ADRs was 5.05% & these were generally minor. Gastrointestinal untoward effects comprising of nausea & vomiting (1.64%) diarrhoea (0.47%), constipation (0.70%) & abdominal discomfort (0.82%) formed the bulk of ADRs. The incidence of CNS related symptoms comprising of headache (0.47%), drowsiness (0.82%) & weakness (0.11%) were more in elderly patients. All ADRs were self limiting and subsided on dechallenge.

Abs. No. S8FC 05

ALTERATION IN INTRACELLULAR CALCIUM REGULATION DURING GRAM NEGATIVE SEPSIS
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DEPT. OF PHYSIOL. LOYOLA UNIV. STRITCH SCHOOL OF MEDICINE, ILLINOIS, U.S.A.

Alterations in intracellular calcium regulation have been implicated in pathophysiologic phenomena culminating in cell injury. Studies in our laboratory have focused on such alterations in the liver and skeletal muscle of animals during gram negative septic injury (GNSI). GNSI was induced in rats after: 1) intravenous injections of endotoxin from gram negative bacteria, 2) intraperitoneal injections of live Escherichia coli, or 3) intraabdominal inoculations of live Escherichia coli and Bacteroides fragilis. Liver samples, isolated hepatocytes, and intact soleus muscles were obtained from control or GNSI rats for the assessments of transmembrane 45Ca fluxes and Ca2+ dependent cellular functions, viz. hepatic gluconeogenesis and Acute Phase Protein biosynthesis, and skeletal muscle hexose transport and protein degradation. Intracellular free Ca2+ concentration [Ca2+]i was measured in hepatocytes using the fluorescent Ca2+ probes, quin-2 and indo-1. Also, the 45Ca fluxes, [Ca2+]i, and Ca2+ dependent functions were quantitated in GNSI rats treated with the calcium channel blocker diltiazem. These studies have indicated that septic injury resulted in elevated hepatocyte intracellular Ca2+ and muscle transmembrane Ca2+ flux along with disturbances in Ca2+ dependent hepatic and muscle functions. Treatment of GNSI rats with diltiazem not only prevented the alterations in [Ca2+]i and Ca2+ fluxes, but also resulted in maintenance of near-control levels of hepatic and skeletal muscle functions. These data support the pathogenric role of disturbed intracellular Ca2+ regulation during septic injury, and a potentially beneficial therapeutic role of the calcium channel blocker against septic injury.
REM SLEEP DEPRIVATION AND NEURONAL EXCITABILITY
Birendra Nath Mallick*, Seema Gulyani and Mahesh Thakkar
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New Delhi 110 067.

Involvement of norepinephrine (NE) in Rapid Eye Movement (REM) sleep is well documented. REM sleep deprivation is reported to affect brain and neuronal excitability. An attempt was made to investigate the mechanism of REM sleep deprivation induced alteration in the neuronal excitability. Since NE influences Na-K ATPase activity, and the latter is likely to affect the trans-membrane potential, it was hypothesized that deprivation may affect the NE level or its degrading enzyme which in turn may affect the Na-K ATPase activity leading to alteration in induced changes in the neuronal excitability.

The results showed that the REM deprivation reduced the monoamine oxidase (MAO) activity and increased the Na-K ATPase activity in the rat brain. Thus, the findings help in explaining the REM deprivation induced alteration in neuronal excitability.

Abs. No. S8FD 02

Ageing and sympathetic nerve activity in humans
Tadaaki Mano

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The sympathetic nervous system plays an essential role to maintain functional homeostasis in the human body. One of the important factors which influence the sympathetic nervous functions is ageing. In this paper, I would like to demonstrate how the human sympathetic nervous system becomes influenced by ageing. For this kind of research, we have so far investigated sympathetic nerve functions indirectly by observing the sympathetic effector activities such as heart rate, blood pressure, peripheral blood flow, sweating and so on, or by measuring the plasma noradrenalin level. In the present study, we used a microneurographic technique and recorded directly the muscle sympathetic nerve activity (MSNA) from the peripheral nerve in healthy human subjects of different ages. The results clearly indicated that the ageing increased the basal level of MSNA, while decreased the MSNA responsiveness to gravitational stress. I would like to mention about the functional significance of the age-dependent changes in sympathetic nerve activity in humans.
ETHANOL-INDUCED CHANGES IN NEURONAL MEMBRANE FUNCTION
Zafar Iqbal*. Department of Neurology & Institute for Neuroscience, Northwestern University Medical School, Chicago, Illinois and Paul Sze, Department of Pharmacology & Molecular Biology, The Chicago Medical School, N. Chicago, Illinois, USA.

Ethanol causes diverse alterations in neuronal membrane fluidity; in vitro exposure of neuronal membranes to ethanol increases membrane fluidity whereas the membranes from animals chronically treated with ethanol become resistant to fluidizing effects of ethanol. The biochemical mechanism associated with adaptive metabolic response to chronic ethanol administration is not known. The aim of our investigations is to understand the chain of events involved in vitro and in vivo changes caused by ethanol in neuronal plasma membrane. Using synaptosomal plasma membrane (SPM) isolated from rat cerebral cortex, we have found that ethanol causes a significant inhibition in 125I-CaM binding to the SPM with a concomitant reduction in the activity of Ca2+-pump ATPase (calmodulin-dependent Ca2+-activated ATPase, CaM-Ca2+-ATPase) in the SPM. The investigations are also focused on the characterization of CaM-binding proteins and enzymes (e.g. CaM Ca2+-ATPase) affected by in vitro exposure of normal SPM to alcohol and in SPM isolated following acute and chronic administration of ethanol to rats. Additionally, studies are also being conducted to determine the relationship of ethanol-induced alterations in SPM binding of CaM to qualitative and quantitative changes in CaM-Ca2+-dependent phosphorylation of neuronal membrane proteins.

ELECTROPHYSIOLOGICAL ASPECTS OF AGEING AND GERONTOPHARMACOLOGY
RAMESHWAR SINGH
School of Life Sciences, Jawaharlal Nehru University, New Delhi-110067.

The ageing brain manifests a number of chemical, physiological and structural alterations. The genetic, molecular and environmental bases of these changes need to be determined for arriving at an understanding of the brain ageing process.

The ageing process arose as a result of trade-offs in the selection for beneficial factors. Approximately two percent of oxygen consumed appears as reactive oxygen radicals the production of which is related to the cytosolic concentration of metal ions such as Fe. The intrinsic antioxidative processes fail to completely detoxify the oxidants. The oxidative stress may alter gene expression besides inflicting damage on biologically important macromolecules. These two effects appear to have an important role in the etiology of ageing. Data obtained from our experiments have shown that the age-related elevation in oxidative damage is correlated with age-related decrement in neuronal electrophysiological activity. Pharmacological experiments further showed that oxidative stress-related ageing effects can be reversed.
**Abs. No. P8FC 01**

COGNITIVE FUNCTIONS IN CHRONIC PAIN PATIENTS - ELECTROPHYSIOLOGICAL STUDY

Om P. Tandem and Sanjay Kumar*

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UCMS & GTB Hospital, Shahdara, Delhi-95.

P3 component of event related potentials has been applied as an index of information processing in a wide variety of normal and cognition impaired subjects. The present study was undertaken to examine possible changes in central nervous system processing and subjective appraisal, indexed by cerebral evoked potentials (N200 & P300), in 20 pain free controls and 20 subjects suffering from chronic pain (cervical spondylosis and low backache, sciatica). Standard auditory 'Odd ball' paradigm involving simple discrimination task of concentrating on infrequent (target) stimulus and ignoring the frequent stimulus (non-target) was employed. Evoked response trial of discriminating 32 target stimulus out of 160 total presented (20% target and 80% non-target, randomly) were replicated and analysed by computer. There was significant increase in P3 latency in pain patients as compared to age and sex matched controls, suggesting change in cognitive functions.

**Abs. No. P8FC 02**

BRAIN STEM AUDITORY EVOKED RESPONSES (BAEPs) DURING COLD PRESSOR TEST (CPT).


This study was conducted to find out if there are any changes in Brain Stem auditory evoked responses during CPT in healthy young volunteers. 13 Medical students of age 18-25 years were the subject of the study. Their BAEPs were recorded using standardized technique employing 10-20 International electroplacement system and sound click stimuli of specified intensity, duration and frequency. Standard CPT was done by dipping the left hand in ice cold water of 0±2°C. Pain threshold & tolerance were recorded in each case along with heart rate & blood pressure. The BAEPs were also recorded before and during CPT and the values of absolute peak latency and inter peak latency and amplitude of V & I compared. Most of the values of BAEPs did not show any significant change except increase in V/I ratio during CPT along with a significant increase in heart rate & Blood pressure. These findings suggest that there seems to be some interaction of autonomic responses with brain stem auditory pathways.
Abs. No. P8FC 03

PUPILARY DILATION TO DIFFERENT DROP VOLUMES OF PHENYLEPHRINE IN HUMAN.

AVTAR LAL* AND A. P. S. NEKI

DEPTS. OF PHARMACOLOGY & OPHTHAL., MGIMS SEVAGRAM, DISTT. WARDHA (MAHARASTRA)

Phenylephrine eye drop is commonly used to produce pupillary dilation (PD) during fundus examinations. There are some experimental studies to document that as the drop volume of ophthalmic solution decreases, the intraocular penetration of drug increases. Therefore, one can anticipate that this may enhance the therapeutic response. Keeping in mind the above fact the present, double blind, parallel design study was planned to investigate the acute effect of different drop volumes (10, 20, 40, 80 ul) of phenylephrine 10% eye drop on PD in human volunteers. The PD was measured at 0 hr (basal), 0.25, 0.5, 0.75, 1, 1.5, 2, 2.5, 3, 4, 6 hrs after drop volumes instillation. There is no difference in PD at 0 hr, however there was a significant increase from 0.5 to 6 hr as compared to basal (p<0.05). PD to 10 ul drop volume was more than 20, 40 or 80 ul, though the results were statistically not significant. The better response on PD to 10 ul than to other higher drop volume can be due to more intraocular penetration.

Abs. No. P8FC 04

EFFECTS OF 5HT, CYPROHEPTADINE AND PARACHLOROPHENYLALANINE (PCPA) ON AVOIDANCE LEARNING BEHAVIOUR AND NOCICEPTIVE CHANGES IN THE CENTRAL GRAY.


Experiments were conducted in rats with cannulae implanted in the central gray regions. They were given 30 trials of foot-shock stress and the mean avoidance latencies were recorded. The pain thresholds were monitored using the tail flick test. Microinfusions of 5HT, PCPA and Cyproheptadine (10 ug/ul) were given in the central gray. Results showed that 5HT microinfusions increased the mean avoidance latencies with hyperalgesia. Cyproheptadine microinfusions produced a moderate decrease in the mean avoidance latency with no effects on the pain thresholds. PCPA microinfusions increased the mean avoidance latencies, which were higher than those observed after 5HT, with no changes in pain thresholds. The observations suggest the possible existence of two types of 5HT receptors or pathways in the central gray.
CHANGES IN LOCOMOTION AND DEFEICATION FOLLOWING INESCAPABLE FOOT SHOCK.
Suresh Sudha and Pradhan, N.N. Department of Psychopharmacology, National Institute of Mental Health & Neurosciences, Bangalore - 560029. India.

The effect of predictable and unpredictable footshocks on different parameters of motility was studied immediately, at 1 hour and at 24 hours after shock. The predictability of the shock was controlled both by time and by presenting a compound light and tone stimulus that preceded the shock for one group and was not correlated to the shock for another group. Footshock induced stress causes increases in the motility behavior of rats which persists for 24 hours. Of the parameters studied, distance travelled and time spent in ambulatory behavior are significantly affected but there is no difference between the predictably and unpredictably shocked animals in the pattern or time course of stress induced locomotion changes. The defeation scores recorded after the footshock are lower than the controls in both the groups and there is no difference between the groups. Lack of differences in motility and defeation between the two groups limit their usage as distinctive paradigms in behavioral experiments.

EVALUATION OF ELECTROACUPUNCTURE, MORPHINE AND CLONIDINE ON THE RAT TAIL FLICK RESPONSE.

N. SHANKAR*, A. VARSHNEY, A. BHATTACHARYA, AND K.N. SHARMA
Department of Physiology, University College of Medical Sciences & G.T.B. Hospital, Delhi 110 095

This study evaluates and compares the analgesic effect of electroacupuncture (EA), morphine and clonidine versus the combination of EA + morphine and EA + clonidine by determining the tail flick latency (TFL) in rat. Sixty rats were studied and subdivided into 6 groups of 10 rats each. Group I rats served as control group while Group II-IV were subjected to EA for 20 mins (at Zushanli and Kunlun points), morphine (5 mg/kg bw 1/p), clonidine (30 μg 1/p), EA + morphine and EA + clonidine respectively. TFLs were assessed 20 mins after the procedure at 10 min interval until the values returned to the baseline. The TFL of the control group was 3.9±0.7 sec. but following the procedure the TFL increased to >10 sec in all the groups and the recovery period varied from 133.0±26.2 min to 34.0±0.6 min, being maximum in Group V.
SUPERFICIAL THERMAL GRADIENTS DURING BODY COOLING AND ITS RELATIONSHIP TO FOREARM BLOOD FLOW.
SARAL THANGAM*, MARIO VAZ, A.V.KURPAD, AND P.S.SHETTY.
Nutrition research Centre, Department of Physiology, St. John's Medical College, Bangalore - 560 034.
Eleven adult male subjects were exposed to a mild cold stimulus for 40 minutes. Anthropometric measurements including height, weight and skinfolds were taken. Forearm blood flow was measured using a venous occlusion plethysmograph and skin temperatures were recorded using thermal sensors (LM 335). The decrease in forearm blood flow correlated well with the fall in finger temperature. The percent reduction in forearm blood flow correlated well with the finger-ambient gradient (r=0.7; p < 0.01) and with the forearm-finger gradient (r=0.7; p < 0.01), which was expressed as a percentage of the forearm ambient temperature gradient. The forearm-finger gradient reflects the forearm blood flow better than the finger-ambient temperature gradient. It is suggested that the change in skin temperature directly correlates with the change in forearm blood flow during a mild cold stimulus.

Acknowledgement: This study was supported by the Nestle Foundation, Switzerland.

ABS. NO. P8FC 12

MIDBRAIN ADRENERGIC MECHANISMS MODULATING FLIGHT BEHAVIOUR INDUCED BY HYPOthalAMIC STIMULATION.
Department of Physiology, All India Institute Of Medical Sciences, Ansari Nagar, New Delhi-110029, INDIA.

The present study was carried on in ten cats of either sex. Flight response was obtained by electrical stimulation of dorsomedial regions of preoptic area (A12-14.5,L1.5,V-3.5 to-3.7) and lateral hypothalamic regions (A12.5,L2.5-3.5,V-3.7). It consisted of a goal directed attempt to get out of the cage with a vigorous leaping to foot. Noradrenaline when microinjected in 1ug doses into pretectal area of midbrain (A3.5,L.0,V1.0-1.5mm) significantly lowered the mean current strength from 640µA to 420µA; clonidine, an alpha-2 agonist in 5ug dose when microinjected into the same locus also significantly lowered the mean current strength to the same level. On the other hand yohimbine, an alpha -2 blocker in 5ug dose when microinjected to the same locus significantly increased the mean current strength from 640 to 970 µA. These results indicate that hypothalamically induced flight response is mediated via the alpha-2 adrenoceptive mechanism operating at the midbrain level.
Control microinjection of normal saline and propylene glycol in similar volumes failed to produce any changes in current strength.
Abs. No. P8FD 01

STUDY OF BASOPHILS AND MAST CELLS WITH REGARD TO THEIR ROLE IN ANAPHYLAXIS.

B. Sedananda* and K. Kireeti, Department of Physiology, Kasturba Medical College, Mangalore - 575 001.

30 guinea pigs weighing approximately 500 gms. were sensitised with a small dose of crude egg albumin. After 3 weeks a second dose of same solution at high concentration was injected to 15 guinea pigs and the rest of them received solution with low concentration.

The basophils from blood smear and mast cells from connective tissue of grcin region was stained metachromatically. With low doses of antigen the degree of degranulation in both basophils and mast cells were more as evidenced by the increase in the number of D cells. On the other hand, an excess of antigen failed to evoke significant degranulation.

It is concluded that to have an optimal anaphylactic reaction a critical concentration ratio of antigen and antibody is required.

Abs. No. P8FD 02

ACTION OF ARECOLINE ON DIFFERENT GROWTH PHASES AND ON MACROMOLECULAR SYNTHESSES OF DICTYOSTELIUM DISCOIDEUM.

Sudhasri and S. Chatterjee
School of Life Sciences, Jawaharlal Nehru University, New Delhi-110067.

A major alkaloid, arecoline, obtained from betel nut (Areca catechu L.) is extensively used by the people of India. This alkaloid has proved to be a potent environmental hazard. It has been shown to cause DNA strand breaks & sister chromatid exchanges. We studied the action of this alkaloid on the cellular slime mould Dictyostelium discoideum on its growth cycle. It has been shown that the cells are almost equally sensitive at different phases of their growth (Lag, Log & Stationary) to 5% treatment of arecoline for 30 minutes. Arecoline treatment kills between 50–65% of cells at various growth phase. The effects of arecoline on DNA and protein synthesis has also been studied. The arecoline treated cells also remain spherical instead of being amoeboid like the control cells. The surviving arecoline treated cells show a considerable delay in growth as evidenced by their colony forming ability.
CONSTRUCTION OF SYNTHETIC IMMUNOGEN: USE OF THREE CS VARIANTS OF P. VIVAX & POLYTUFTSIN IN MALARIA VACCINE.

DEVI GAYATHRI R.* and RAO ON.
Deptt. of Biochemistry, All India Instt. of Medical Sciences, New Delhi 110029.

The failure of sporozoite vaccines using the repeat sequences as immunogen in malaria caused by P. vivax either due to genetic restriction in the host, antigenic variability &/or lack of secondary response has led to the present study. Polytuftsin (PT), a natural immunomodulator, was chemically coupled to three variant dimers viz. DA, DD & AA of the circumsporozoite (CS) protein, a nine amino acid repeat that covers the surface membrane of infective sporozoites. The purity of the conjugates was tested physico chemically. The peptide dimers & hybrid structures (peptide dimers linked to PT) were studied for humoral & antigen stimulated T cell proliferation in five inbred strains of mice with different haplotypes. All the results indicate the immunogen constructed to be a promising subunit vaccine against P. vivax.

CELL MEDIATED IMMUNE STATUS IN BENIGN AND MALIGNANT INTRACRANIAL TUMOUR PATIENTS

Kempu Raj D., A. Namasiyavan@ and J. Reginald®
Department of Physiology, Dr. ALM P.G. I.B.M.S
University of Madras, Taramani, Madras - 600 113.
®Institute of Neurology, Madras Medical College and Government General Hospital, Madras - 600 003.

Absolute Lymphocyte count, Absolute T-Lymphocyte count and Percent E - Rosette count were studied in various Benign and Malignant Intracranial tumour patients pre-operatively to assess Cell Mediated Immune status. Significant decrease in percent E - Rosette count and absolute T-Lymphocyte count were observed in both benign and malignant intracranial tumour patients than Control. Though the absolute lymphocyte count decreased in patients, the observed change was not significant.
Abs. No. P8FD 05

CELL MEDIATED IMMUNE RESPONSE IN BENIGN AND MALIGNANT INTRACRANIAL TUMOR PATIENTS

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Department of Physiology, Dr. ALM P.G.I.B.M.S.
University of Madras, Taramani, Madras - 600 113.
Institute of Neurology, Madras Medical College and Government General Hospital, Madras - 600 003.

Cell Mediated Immune (CMI) response in various Benign and Malignant intracranial tumor patients was assessed preoperatively by in vitro Leukocyte Migration Inhibition (LMI) test using Candida as antigen. Significant decrease in percentage inhibition of leukocyte migration was observed in benign tumor patients than control. Though malignant tumor patients also shown decrease in percentage inhibition the observed change was not significant, this may be due to increase in Suppressor cell ratio with more production of Leukocyte migration stimulation factor. Thus cell mediated immune response was greatly impaired in benign than malignant.

Abs. No. P8FD 06

EFFECT OF EXPOSURE TO STRESSFUL CONDITIONS ON THE HUMORAL IMMUNE RESPONSE OF MICE

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Centre for Biotechnology, Jawaharlal Nehru University
New Delhi - 110 067, INDIA

Mice were exposed to heat stress at 40°C for 15 minutes or to cold stress at 4°C for 30 minutes or were kept immobilised for 25 minutes every day for 12 days and its effect on primary and secondary immune response to different antigens were analysed by Enzyme linked Immunosorbent assay. Significant differences were observed in the antibody titres of primary response between stressed and control mice. While heat and cold stress resulted in suppression, the immobilisation stress showed enhancement of primary response. After giving stress for 12 days when the mice were boosted with the same antigens on 21st day no significant differences in secondary responses were observed in any group. This preliminary study indicates that stress only at the time when the immune system encounters the antigen affects the immune response.
ROLE OF CALCIUM IN NERVE INDUCED MELANOSOME AGGREGATION WITHIN LABEO MELANOPHORES

Shashi Patil and Ajai K. Jain
Pigment Cell Biology Unit, School of Studies in Zoology, Jiwaji University, Gwalior - 474011.

In isolated scale melanophores of Labeo rohita the melanosome - aggregating effect of K⁺ was inhibited in Ca²⁺ deprived medium. Moreover, the Ca²⁺- antagonists, verapamil and lanthanum inhibited the action of K⁺ in concentration dependent manner. The elevation of extracellular Ca²⁺ could compromise the verapamil induced inhibition in a concentration dependent manner. The cation Ca²⁺ appeared to be required only for K⁺-induced aggregation and not for melanosome aggregation per se, as in this fish adrenaline and melanin concentrating hormone effectively caused aggregation of melanosomes in Ca²⁺ deprived medium.

A study of Serum Bilirubin in relation to the maternal age and parity.


The study was performed on 122 neonates. Serum bilirubin estimations were done in cord blood subsequent on day 3 & day 5 of life in neonates of mothers divided in three groups according to age and two groups according to parity. Though values of Serum Bilirubin were different, but no significant difference was observed between different groups.

** ** **
**Abs. No. P8FE 02**

**EFFECTS OF DIETARY SPICES ON GASTROINTESTINAL STRUCTURE AND FUNCTION IN RATS**


Dept. of Physiology, All India Institute of Medical Sciences, New Delhi

Experiments were conducted on 19 developing rats, 2-3 months old, divided into two groups. One group (C) was fed on a powdered diet (n=10) and the second group (G) was fed on a similar diet containing 5% garam masala powder w/w (n=9) for a minimum period of four weeks before being sacrificed. The intestine was excised between the pylorus and the ileo-caecal junction, and its length and weight recorded. The liver was also excised and weighed. Absorption of glucose by a segment of the small intestine was studied by the everted sac technique. The observations have been tabulated below:

<table>
<thead>
<tr>
<th>Heart Rate</th>
<th>Sub-hepatic</th>
<th>Length of Intestine</th>
<th>Weight of Intestine</th>
<th>Weight of Liver</th>
<th>Absorption of Glucose</th>
</tr>
</thead>
<tbody>
<tr>
<td>(beats/min)</td>
<td>Temp. (°C)</td>
<td>(cm)</td>
<td>(g)</td>
<td>(g)</td>
<td>(μg/g/100g)</td>
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<tr>
<td>C(n=10)</td>
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<td>244.0</td>
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These findings suggest that long term intake of dietary spices could lead to some structural alterations/adaptations in the gastrointestinal tract, while the digestive-absorptive function may not change.

**Abs. No. P8FE 03**

**LONG TERM INTAKE OF DIETARY SPICES INCREASES LOCOMOTOR ACTIVITY IN RATS.**


Dept. of Physiology, All India Institute of Medical Sciences, New Delhi

The study was conducted on 15 developing rats, 2-3 months old, divided into two groups. One group (C) was fed on a control diet in a powdered form (n=6) and the second group (G) was fed on a similar diet, but containing 5% garam masala w/w (n=9) for a minimum period of four weeks. The activity of the animal was quantified by the Videopath Analyzer Model E61-21, for one hour in the morning. The gain in weight in C (58.7 ± 14.8 g, mean ± S.D.) was significantly (P<0.05) more than in G (22.6 ± 8.8 g) at the end of four weeks. Activity monitoring showed that the G spent more time in locomotion (410 ± 150 sec vs. 105 ± 40.4 sec, P<0.001) and moved a greater distance (7120.9 ± 2626.3 cm vs. 1807.7 ± 693.9 cm, P<0.001) with a more average speed (118.2 ± 43.8 cm/min vs. 29.7 ± 11.4 cm/min, P<0.001) as compared to group C animals. These findings suggest that increase in locomotor activity induced by dietary spices could be responsible for smaller weight gain.
**Abs. No. P8FE 04**

LUNG FUNCTIONS IN MALNOURISHED CHILDREN AGED 5 TO 10 YEARS.

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122 East Delhi children, aged 5 to 10 years, of both sexes comprising 64 Control and 58 Protein Energy Malnutrition (PEM) cases were randomly selected. Incidence of PEM Grades I, II, III & IV was 31.15%, 13.93%, 1.64% & 0.82%, respectively. Lung Function Tests - Forced Vital Capacity (FVC), Forced Expiratory Volume in one second (FEV₁) & Peak Expiratory Flow Rate (PEFR), were performed on them. FVC and FEV₁ directly correlate with the Body weight (p<0.01), but PEFR does not. Control group shows significantly (p<0.05 to 0.001) higher values of FVC & FEV₁ than the PEM group in each of the 5-6, 7-8 & 9-10 years age group. PEFR values are higher in Control than PEM group but the difference is not significant (p>0.10).

**Abs. No. P8FE 05**

HEXOSE MONOPHOSPHATE SHUNT ACTIVITY IN ISOLATED KUPFFER CELLS FROM ENTAMOEBA HISTOLYTICA INFECTED AND TINIDAZOLE TREATED PREINFECTED GUINEA PIGS IN PRESENCE OF ERYTHROCYTES, TROPHozoITS AND LATEX.

SHARMA RAKESH, SHARMA, A., SINGH, V. S.

A. C. P. M. MEDICAL COLLEGE, DHULE (M. S.) and L. L. R. MEDICAL COLLEGE MEERUT (U. P.)

30 Guinea pigs in three groups comprising control; Entamoeba histolytica treated; and tinidazole treated groups were used for Kupffer cells. Different groups were compared for 14CO₂ liberation from 14C-glucose (dpm) when isolated group specific Kupffer cells were treated with their cultures in the presence of erythrocytes, Entamoeba histolytica trophozoits and latex particles, with normal Kupffer cells.

The phagocytic activity of Kupffer cells was effected by particle cell ratio and type of particles used. Moreover tinidazole induced phagocytic activity faster with nonsignificant differences than other groups.

Tinidazole treatment for amoebic liver abscess certainly is associated with energy preservation through the hexose monophosphate shunt activity in Kupffer cells.
Abs. No. P8FE 06

ALTERNATIVE PATHWAYS OF GLUCOSE METABOLISM IN RAT BRAIN.
Hansoor A. Ansari and Najlaa Z. Baguer
Hormone & Drug Research Laboratory,
School of Life Sciences, Jawaharlal Nehru University,
New Delhi 110067

Changes in the alternative pathways of glucose metabolism were studied in crude homogenate of choroid plexus and synaptosomal fractions of rat brain in experimental diabetes. The metabolic pathways were estimated by studying the flux of differentially labeled \([^{14}C]-glucose\). An overall decrease in glucose oxidation was seen in the choroid plexus as well as in synaptosomes of the diabetic animals. A decrease in the pentose phosphate pathway was also observed in both the tissues which were partially recovered to control levels with insulin administration. Choroid plexus had more glucose metabolic turnover rate than the synaptosome.

Abs. No. P8FE 07

LACK OF KINETIC INTERACTION BETWEEN DOMPERIDONE AND ACETYSALICYLIC ACID IN NORMAL VOLUNTEERS
S.P. Dhaneria, N. Saha, Naresh Kumar, S.S. Handu,

Domperidone being prokinetic drug facilitates the gastric emptying. In this study the effect of Domperidone on acetyl salicylic acid kinetics is studied in 6 healthy male volunteers adopting randomized cross-over design. Volunteers were given either Acetyl Salicylic acid (350 mg) or Acetyl salicylic acid (350 mg) plus Domperidone (10 mg) simultaneously or Domperidone (10 mg) 30 min before the Acetyl salicylic acid (350 mg). A wash out period of 7 days was given between the treatments. Blood samples were collected at 0, 0.5, 1, 2, 3, 4, 6 & 9 h after drug administration. Plasma salicylate levels were measured spectrophotometrically. The results indicate that there is no kinetic interaction between Domperidone & Acetyl salicylic acid.

Department of Pharmacology, PGIMER, Chandigarh, India
MODULATION OF 5HT RECEPTOR SUBTYPES AND ANTIDEPRESSANT ACTION OF CHRONIC SWIM EXERCISE IN RATS.

Sangita Dey* and R.H. Singh. Neurophysiology Unit, Dept. of Physiology, and Dept. of Kayachikitsa, Inst. of Medical Sciences, BHU, Varanasi. Using behavioral model for assessing post-synaptic 5HT1a and 5HT2 receptors as well as 5HT1a autoreceptors activated by agonists, 5-MEODMT and 8-OH-DPAT, the following results were obtained: 1. Chronic swim exercise produced functional subsensitivity of post-synaptic 5HT1a ad 5HT2 receptors. 2. In behaviorally depressed rats (Katz model), post-synaptic 5HT1a and 5HT2 receptors show both subsensitivity and supersensitivity at certain specific neuronal circuits; rats showing adaptation to chronic stressors (Katz model) exhibit enhanced post-synaptic 5HT1a receptor function as a salient feature. 3. Concurrent application of swim exercise along with chronic stressors prevents development of depression in rats (Open-Field Test). Such exercise-induced antidepressant effect is accompanied with profound enhanced 5HT2 receptor function (with least effect on pre- and post-synaptic 5HT1a function) which bears a close similarity with that of repeated Electroconvulsive shock in rats.

CARDIAC RESPONSIVENESS TO NEUROTRANSMITTERS DURING ACUTE NORMOVOLEMIC HAEMODILUTION IN ANAESTHETIZED CATS

ANITA KHURANA*, M.E. HUSSAIN and M. FAHIM
Department of Physiology, V.P. Chest Institute, University of Delhi, Delhi-110 007.

Haemodynamic responses to adrenaline, acetylcholine, histamine and 5-HT were investigated before and after induction of acute normovolemic haemodilution by dextran in anaesthetized cats. Haemodilution induced an increase in cardiac output and decrease in systemic vascular resistance, however, other haemodynamic parameters (LVP, LVdp/dt max, MAP and RAP) did not change significantly (P>0.05). Haemodynamic changes elicited by intravenous administration of these neurotransmitters were significantly reduced (P<0.05) after the induction of haemodilution. However, maximum reduction in responses was observed when the Haematocrit level dropped to 12-14%. Our results indicate that cardiovascular responsiveness is reduced after haemodilution, which could be due to inadequate myocardial O_2 supply as suggested by others.
NOCICEPTION, ANTINOCICEPTIVE POTENCY OF MORPHINE AND STRESS INDUCED ANALGESIA IN STREPTOZOTOCIN INDUCED DIABETIC RATS.


Experiments were carried out to find out the effect of streptozotocin induced diabetes on pain perception and also to elucidate the interrelationship of morphine analgesia and stress induced analgesia in diabetics. Tail flick threshold, vocalisation and post stimulus vocalisation showed variable results in diabetic rats. Some showed hyperalgesia while other showed analgesia or no change. Thus, hyperalgesia were not a constant feature in diabetic rats. Results also indicated the blunted effect of acute stress induced analgesia at the level of lower brain stem in diabetics. The analgesic effect of morphine was more evident at levels higher than the lower brain stem and this was reduced in diabetics indicating the antagonistic effect of glucose on opiate receptors.

LONG TERM INTAKE OF YOGURT PRIMES SPLENIC T-LYMPHOCYTES FOR A BETTER MITOGENIC RESPONSE IN MICE

Punita Puri*, S.C. Mahapatra, R.L. Bijlani and Indira Nath

Department of Physiology and Biotechnology, All India Institute of Medical Sciences, New Delhi.

The study was conducted on 21 random bred swiss albino mice, age 21-28 d, divided into two groups. One group (M) was fed on a milk-based diet (n=9) and the second group (Y) was given a yogurt-based diet (n=12) for a period of 10 months. The proliferation response of splenic lymphocytes to concanavalin A (Con A), phytohaemagglutinin (PHA) and lipopolysaccharide (LPS) was measured by H-thymidine incorporation. A significantly higher proliferation was observed in group Y as compared to group M in response to only Con A and PHA. Proliferation response of splenic lymphocytes to Con A was (mean ± SD) 15270 ± 1954 cpm in group M and 18100 ± 3260 cpm in group Y (P=0.04), and to PHA was 25999 ± 3360 cpm in group M and 29690 ± 3370 cpm in group Y (P = 0.01). The proliferation response to LPS in groups M and Y was 17409 ± 3619 cpm and 18938 ± 2978 cpm respectively (N.S.). These findings suggest that long term intake of yogurt primes the splenic T-lymphocytes but not B-lymphocytes for a better mitogenic response.
EFFECT OF AMINOPHYLLINE ON COLD INDUCED THERMOGENESIS IN HYPOTHALAMIC OBESE RATS

ARORA V., SACHDEVA U., NAYAR U. & MATHUR R.
Deptt. of Physiology, All India Institute of Medical Sciences, New Delhi-110029.

Previous investigators have reported poor cold induced thermogenesis (CIT) in genetically obese strains of rats, e.g., Zucker, ob/ob & LA/Ncp. Administration of Aminophylline (a phosphodiesterase inhibitor & adenosine antagonist) improves their CIT. The action of Aminophylline (Ampy) in hypothalamic obese animals has not been investigated. The present study was therefore conducted to study CIT of rats made obese by VMH lesioning & compared with non-obese, sham operated animals. Oxygen consumption (VO) & colonic temp. (Tc) were measured as indices of CIT. Subgroups of obese (OB) & non-obese (NOB) animals were administered Ampy (18.7 mg/kg ip) & saline 30 min. prior to acute cold exposure (ACE) of 4-6°C for 60 min. & thermal tolerance measured. The OB rats showed a lower Tc & VO than NOB animals before, during & after ACE. Ampy treatment increased VO & prevented fall in Tc in NOB rats but failed to do so in OB rats. Our findings thus indicate that the action of Ampy is mediated through central mechanisms.

AMYGDALAR INFLUENCES ON NOCICEPTION

MENA NARASAIAM*, MATHUR, R. AND NAYAR, U.
Department of Physiology, All India Institute of Medical Sciences, New Delhi.

Amygdala is known to play an important role in the expression of emotional and motivational aspect of behaviour. The parabrachial-amygdaloid projections have been implicated in the nociceptive mechanisms of emotional, affective, behavioral and autonomic responses of pain. In the present study, the effects of electrical stimulation (square wave pulses, 100 Hz, 100-750 μA) of amygdala on tonic (formalin test) and phasic pain were investigated in conscious rats (n=10). The thresholds for tail-flick latency (TFL), simple vocalization (SV) and vocalization after-discharge (VA) were determined. Formalin-induced pain (2.04±0.1) was reduced (1.25±0.2) significantly (P<0.001) during amygdalar stimulation. The threshold levels for SV (3.45±1.8) and VA (6.63±3.1) were elevated to 6.77±2.3 and 12.08±3.5, respectively during brain stimulation (P<0.001). No effect was observed on the threshold for tail-flick reflex (1.10±0.2) during amygdalar stimulation (1.28±0.2). TFL to noxious heat was enhanced significantly (P<0.001) from 10.34±1.5 to 18.16±2.1 sec. These results suggest that the amygdala plays an important role in the descending endogenous pain control mechanisms.
Abs. No. P8NAw 07

NEURONAL PLASTICITY REVEALED THROUGH RECOVERY OF LEARNING CAPABILITY AFTER POSTNATAL BRAIN INJURY

Subramani Munirathinam*, Huddanna S. Rao and T. Desiraju

Dept. of Neurophysiology, National Institute of Mental Health and Neuroscience (NIMHANS), Bangalore - 560 029.

Olfactory tract was sectioned bilaterally in Wistar rat pups on the day of birth and they were assessed on Passive Avoidance retention test at the age of 50-60 days or at 240 days. Comparison was made against normal rats of same ages. The results revealed that the deficit created in the learning in the tract sectioned group could be recovered by 240 days provided one extra opportunity for learning was given. Acetylcholine esterase activity was significantly reduced in olfactory bulb, and increased in pyriform cortex by 50-60 days of age in the tract sectioned group, but these changes recovered to normal by 240 days of age. Histology revealed disorganization of glomerular and granule cell layers of olfactory bulb at 50 days of age, but recovered to nearly normal by 240 days of age. This study offers evidence for plasticity in development of brain circuits involved in learning.

Abs. No. P8NAw 08

PLASTICITY OF CA3 HIPPOCAMPAL AND V LAYER MOTOR CORTICAL PYRAMIDAL NEURONS INDUCED BY SELF-STIMULATION EXPERIENCE

B.S. Shankaranarayana Rao*, and T. Desiraju.

Dept. of Neurophysiology, National Institute of Mental Health and Neuroscience (NIMHANS), Bangalore - 560 029.

Self-stimulation (SS) experience was allowed daily for a total of 1 hour for 10 days via 4 electrodes placed in each Wistar rat bilaterally in lateral hypothalamus (LH) and substantia nigra-ventral tegmental area (SN-VTA). After that, rapid Golgi examination of the CA3 hippocampal and layer V pyramidal neurons of motor cortex was made in a grand total of 1600 neurons in 80 rats under 4 groups. The neurons of self-stimulation group revealed significant (ANOVA) increase in dendritic branching and number of intersections in the perisomatic domains of the neurons. Such changes were not observed in neurons of sham control (SH), and experimenter-administered control (EA) groups compared with normal control (NC) group. The results showed that both limbic and neocortical neurons would be subjected to changes during the course of experiences through life.
REGULATION OF SLEEP-WAKEFUL FUNCTION BY CLONIDINE AT THE MEDIAL PREOPTIC AREA

V. Ramesh, V. Mohan Kumar and H. N. Mallick
Department of Physiology, AIIMS, New Delhi 110 029. INDIA.

Sleep-wakeful (S-W) function at the medial preoptic area (mPOA) is probably mediated through alpha adrenoceptors. This study was planned to investigate the type of adrenergic receptors involved in this function. Male adult Wistar rats were implanted with electrodes for polygraphic recording. Clonidine (2ug/0.2ul), an alpha-2 adrenergic agonist, was slowly injected into the mPOA through chronically implanted bilateral cannula, in freely moving rats. Electrophysiological parameters were monitored for 2 h before and 3 h after the injection. All experiments were carried out between 13.00 h and 19.00 h. The polygraphic data was divided into epochs of 30 sec and scored. There was a marked increase in wakefulness, after injection of clonidine. Previous investigation had shown that microinjection of NA produce arousal. The present finding indicates the possibility that the injected NA might have acted on pre-synaptic alpha-2 receptors and inhibited endogenous release of NA. So, the induction of sleep may be the normal function of endogenously released NA.

EFFECT OF REM SLEEP DEPRIVATION ON GLUCOSE METABOLIC ENZYMES

Mahesh Thakkar* and Birendra Nath Mallick
Sch. of Life Sci., J. N. Univ., New Delhi 110 067.

Energy expenditure is known to be altered on rapid eye movement (REM) sleep deprivation. Glucose metabolism and energy expenditure are altered during REM sleep. Hence, to further elucidate the functional state of the brain on REM sleep deprivation, the activities of glucose metabolic enzymes viz. hexokinase and glucose-6-phosphatase were estimated on REM sleep deprivation. Flower pot method was used for one, two and four days deprivation and suitable control experiments were carried out. The results showed that glucose-6-phosphatase was first to be affected and it showed a decreased activity while with increased period of deprivation the hexokinase activity showed an increase. Both the altered enzyme activities returned to control/normal level on recovery. Control experiments suggest that alterations were primarily caused by the REM sleep deprivation and not due to nonspecific effects.
THE EFFECT OF ENDOSULFAN ON THE LEVELS OF NORADRENALINE, DOPAMINE AND 5-HYDROXYTRYPTAMINE DURING POSTNATAL BRAIN GROWTH

Madepalli K. Lakshmane* and Turaga Desiraju
Department of Neurophysiology, National Institute of Mental Health and Neurosciences, Bangalore-560 029, India.

Endosulfan was fed to wistar rat pups at 6mg/kg body weight by gastric intubation from postnatal day 2 to 20 to assess its effect on the levels of noradrenaline (NA), dopamine (DA) and 5-hydroxytryptamine (5HT) in various regions of brain viz., olfactory bulb (OB), hippocampus (HI), visual cortex (VC), cerebellum (Cb) and brainstem (BS). The control group was administered equal volume of vehicle alone. NA, DA and 5HT levels were estimated by HPLC with fluorimetric detection. NA levels were elevated in OB and BS at 10 days of age, in HI and Cb at 20 days of age. DA levels were significantly reduced in OB and HI and increased in BS at 10 days. At 20 days reduction persisted only in HI whereas in OB, the DA level increased. 5HT levels at 10 days of exposure increased in all regions except Cb. This study thus reveals there is a differential regional vulnerability to the toxic effects of endosulfan in the developing rat central nervous system.

OLFATORY BULB TRANSPLANTATION-AMELIORATION OF PASSIVE AVOIDANCE DEFICIT.

Department of Neurophysiology, NIMHANS, Bangalore-29.

A study of embryonic olfactory bulb (OB) transplantation as a remedy for early postnatal damage to OB was done on Wistar rats. Bilateral bulbectomy was done on two day old pups by aspirating the OB. In the cavity so created 1-2mm embryonic OB (E15-E16) was transplanted. After 45-50 days of transplantation they were subjected to step down passive avoidance test along with the normal and bulbectomised animals of the same age. On 2nd day of test 75% of normal animals retained foot shock (which was given on 1st day) memory and did not step down within one minute. On 2nd day remaining animal which step down received another foot shock. These were tested on 4th day, wherein 83.33% of animals did not step down. In bulbectomised group only 20% of animals did not step down on 2nd and 4th day of test indicating a significant passive avoidance retention deficit due to bulbectomy. In the case of transplanted group 61.53% and 69.23% of animals did not stepdown on 2nd and 4th day respectively. Accordingly our results indicate that embryonic OB transplantation facilitated recovery of the lost function due to early brain damage. Neural connectivity and cytoarchitecture of grafts are under further investigations.
INFLUENCE OF VISUAL, CUTANEOUS, AND MECHANORECEPTOR INPUTS ON THE EXCITABILITY OF ALPHA MOTOR NEURONES IN MAN.
E.C.I. INSTITUTE OF ELECTROPHYSIOLOGY FOR FUNDAMENTAL AND APPLIED RESEARCH, BOMBAY, INDIA; AND DEPARTMENT OF PHYSIOLOGY, UNIVERSITY COLLEGE LONDON, ENGLAND, U.K.

On elimination of visual input (blindfolding) firing rate of motor units decreased in a voluntary holding tasks (isometric contraction), averaged amplitude of 'H' reflex (studied at threshold level) was decreased; the latency of the R2 was also increased during withdrawal reflex. With respect to influence of cutaneous and mechanoreceptor inputs from different types of experiments were performed. (1) On prodding index finger held in abduction, M1, M2 and M3 responses were picked up from I.E.M.G. from 1st dorsal inters. m.; M1 was abolished by changing the direction of prodding; M2 was abolished by blocking the cutaneous afferents. (2) I.E.M.G. during maximal isometric contraction of tibialis anterior muscle is seen to reduce after stimulation of Gr.IA fibres from Post.Tib.M. (antagonist). (3) While studying 'H' reflex from soleus muscle when the mechanoreceptors from antagonist muscle (dorsi flexors of ankle) and cutaneous afferents from the dorsum of the foot are stimulated by applying different loads resulting in static stretch, the amplitude of the average 'H' is increased. However, when the subjects were voluntarily contracting, the dorsi flexors to keep the ankle at 90°, the increase in 'H' is not as much as in the previous experiments. The reverse phenomenon is seen in patients with pyramidal tract lesions perhaps partly due to failure of Gr.IA interneurone inhibitory mechanisms. (4) Tension developed in ankle dorsi flexors in withdrawal reflex is reduced on stimulation of Gr.IA fibres of femoral nerve.

MODULATORY INFLUENCES OF PAIN ON EVOKED POTENTIALS.
O.P.TANDON
DEPARTMENT OF PHYSIOLOGY, UCMS & GTB HOSPITAL, SHAHDARA, DELHI.

Painful environment causes sensory, cognitive and motivational disturbances in individual's behaviour. It is still not clear how pain stimuli interact with other sensory mechanisms in brain. We have recorded evoked potentials in acute and chronic pain patients to study these interactions. Stimulus and event related potentials (Auditory and P300) were recorded in pain patients and values of absolute, interpeak latencies and amplitude of various waves were analysed and compared with values obtained in age and sex matched healthy volunteers. No variations except amplitude of waves were seen in stimulus related evoked potentials. However significant increase in P3 latency and amplitude in chronic pain patients was observed. These findings suggest that chronic pain milieu interacts with limbic-cortical cognitive mechanisms and significantly delays various processes involved in these. However, future studies will show the exact mechanism of these interactions, and the nature of neurotransmitter and modulators involved in these.
THEOPHYLLINE-INDUCED LOCOMOTOR ACTIVITY IN NON-TOLERANT AND TOLERANT MAMMALS: INVOLVEMENTS OF CENTRAL SEROTONERGIC ACTIVITY

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Theophylline (Th) (10-20 mg/kg, p.o) produced a dose dependent increase in locomotor activity (LA) of adult male albino rats. This drug (once/day, p.o) at 10 mg/kg for 16 consecutive days or 20 mg/kg for 14 consecutive days developed tolerance to LA. Th-induced stimulation of LA was found to be maximum on the fourth day of treatment at both doses under similar condition. A single dose of L-5-HTP (10-40 mg/kg, i.p) showed a dose dependent inhibition of LA in control rats. It is also noted that L-5-HTP at subeffective dose (5 mg/kg, i.p) reduced Th-induced LA in non-tolerant or tolerant rats. pCPA (300 mg/kg, i.p), also enhanced LA of Th non-tolerant and tolerant rats. In tolerant rats, methysergide (5 mg/kg, i.p) enhanced the Th-induced LA. Measurement of hypothalamic and striatal serotonergic activity, in terms of 5-HIAA/5-HT ratio and probenicid-induced accumulation of 5-HIAA, was found to be reduced in Th non-tolerant rats and restored to normal activity in tolerant rats. These results, thus suggest that Th-induced stimulation of LA may be mediated through the disinhibition of central 5-HT activity and enhanced central 5-HT receptor sensitivity may develop tolerance to Th-induced LA.

CAFFEINE AND THE DEVELOPMENT OF BENIGN AND CARCINOMATOUS MAMMARY TUMORS IN CARCINOGEN - TREATED FEMALE SPRAGUE-DAWLEY RATS

Dept. of Pharmacology & Toxicology, Michigan State University, East Lansing, MI 48824, U. S. A.

The objective of this study was to determine the effect of chronic caffeine consumption on the initiation and promotion stages of DMBA- and MNU-induced mammary gland tumorigenesis in female rats. Female Sprague-Dawley rats were treated i.v. with a low dose of DMBA (0.5 mg/100g B. Wt.) or a standard dose of MNU (2.5 mg/100g B. Wt.) at 55 days of age. Caffeine (500 mg/liter of drinking water) was provided from 25 to 60 days of age (initiation stage) or from 60 to 125 days of age (promotion stage). All animals were sacrificed at 125 days of age, mammary tumors were excised and examined histopathologically. The results of this study indicate that caffeine can significantly influence development of benign and carcinomatous mammary glands tumors in carcinogen - treated female rats, a phenomenon dependent upon the time span of caffeine treatment and the type of carcinogen used (direct or indirect acting); the effect of caffeine on modulating this tumorigenic process was predominantly inhibitory. (Supported by NIH research grant CA-37615).
Abs. No. S9FF 01

SUPPRESSION OF HUMORAL IMMUNE RESPONSE BY CYCLOSPORIN A IN MICE

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New Delhi - 110 067, INDIA

Cyclosporin A, a fungal metabolite, is the clinician's choice as an immunosuppressive drug. It exerts its effect by blocking lymphokine transcription and hence lymphokine mediated T cell proliferation. While good deal of information is available about how it acts on certain subpopulations of T cells of rodents and man, virtually nothing is known about how blocking of T cell proliferation affects humoral response. We have analysed humoral immune response against Shigella dysenteriae and Escherichia coli antigens in mice treated with Cyclosporin A by using Enzyme linked Immunosorbent assay and Immunoblot technique. We observe that there is profound suppression of humoral response to these antigens in mice.

Abs. No. S9FF 02

IMMUNE RESPONSE TO ENVIRONMENTAL EXPOSURE OR SPECIFIC SENSITIZATION WITH THE ANTIGENS OF MYCOBACTERIUM TUBERCULOSIS.

Anila Prabhu, Uday Kumar, Apurva Sarin and R.K. Saxena*
School of Life Sciences, Jawaharlal Nehru University, New Delhi-110067.

Tuberculosis is a very common infection in India. It is estimated that more than half the Indian population may be infected with Mycobacterium tuberculosis (M. Tb) which suggests that environmental exposure to M. Tb may be high in the country. In developed countries, exposure to M. Tb is expected to be relatively low. We have assessed the anti-M. Tb antibody and the related circulating immune complexes in sera sample from Indian and american donors, and compared these levels to those found in sera from tuberculosis patients. Cellular immune response in control and infected/immmunized population have also been studied in human and mouse models. These results will be discussed.
Abs. No. S9FF 03

G-PROTEINS AND ADENYLATED CYCLASE/CAMP SIGNAL TRANSDUCTION IN HYPERTENSION.
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The present studies were undertaken to examine if adenylate cyclase activity and the levels of G-proteins (Gαs and Gαi) are altered in cardiovascular tissues in hypertension. We have determined the adenylate cyclase activity and its responsiveness to stimulatory and inhibitory hormones as well as the levels of G-proteins by using specific antibodies and cDNA probes in hearts from DOCA-salt hypertensive rats (HR) and hearts and aorta from spontaneously hypertensive rats (SHR). The stimulatory effects of guanine nucleotides, isoproterenol, glucagon etc. on adenylate cyclase activity were decreased in both the models of hypertensive rats as compared to the control rats, whereas the inhibitory hormones, inhibited enzyme activity to a greater extent in hypertensive rats as compared to control rats. Furthermore, the levels of Gαi2 protein and Gαi2 mRNA as determined by immunoblotting and Northern blotting techniques respectively were higher in both DOCA-salt HR and SHR as compared to control rats. However, the levels of Gαs were unaltered in SHR but decreased in DOCA-salt HR. These data suggest the differential regulation of Gαs in experimentally induced hypertension and genetic model of hypertension, and that the altered expression of G-proteins may partly be responsible for the decreased responsiveness of adenylate cyclase to hormone stimulation and increased responsiveness to hormone inhibition in hypertensive rats.

Abs. No. S9FF 04

SIGNAL TRANSDUCTION, SECOND MESSENGERS AND PLATELET FUNCTION.
G.H.R. Rao* and J.G. White, Department of Laboratory Medicine and Pathology, University of Minnesota Medical School, Minneapolis MN 55455.

Blood platelets interact with a variety of agonists. These interactions stimulate specific receptors on the plasma membrane and lead to the activation of intracellular enzymes. Ionized calcium is the bioregulator, and a variety of biochemical mechanisms modulate the level and availability of cytosolic calcium. Major enzymes that regulate the free calcium levels via second messengers (SM) include, phospholipases (PLC), adenylyl cyclases and guanylyl cyclases. Activation of PLC results in the hydrolysis of phosphatidyl inositol bisphosphate and formation of SM, 1,2-diacylglycerol (DG), and inositol 1,4,5-trisphosphate (IP3). DG induces activation of protein kinase C, whereas, IP3 mobilizes calcium from internal membrane stores. Elevation of calcium stimulates phospholipase A2 and liberates arachidonic acid (AA), which is transformed to a novel metabolite, thromboxane. This is the major metabolite of the AA pathway and plays a critical role in platelet activation. Alterations in signalling pathways by environmental stress will increase the risk for thrombosis, bleeding diathesis and stroke. Since transmembrane signalling mechanisms are common for intracellular and intercellular communications, some salient aspects of these novel signal transduction pathways will be presented.
MOLECULAR MECHANISM IN ACQUIRED RESISTANCE TO TUBERCULOSIS INFECTION.
RAMA MUKHERJEE AND INDIRA GULERIA,
MICROBIOLOGY DIVISION NATIONAL INSTITUTE OF IMMUNOLOGY, NEW DELHI 110 067.

Acquired resistance against tuberculosis was studied by prior immunization, challenge and restimulation in vitro of the immune T cells with mycobacterial antigens (m tb). Acquired resistance was better induced by live attenuated M.bovis BCG a cross reactive mycobacterium than the pathogen itself which was mediated by dominant cross-reactive antigens that get easily identified by the immune system because of the previous priming. Therefore even for low antigenic load, an effective immune response is mounted resulting in immunity. Remarkable antitubercular immunity was also induced by another cross reactive non-pathogenic, mycobacterium w. M.w has antigens that cross-react with M.tuberculosis and BCG at B and T cell level. It conferred immunity to BCG-responder and nonresponder strains of mice against sublethal challenge with virulent M.tuberculosis. It conferred significant immunity to guinea pigs. These findings revealed high immunogenicity of M.w. M.w induced protection in mice was adoptively transferred by immune T cell to naive syngenic recipients. When mice were immunized with M.w and restimulated in vitro with m tb their T cells produced interleukin-2 and IFN- but no detectable levels of IL-4 and IL-5 suggesting that M.w induced immunity against M.tuberculosis rests primarily on CD4+TH1 CELL. Subsequent invivo studies in mice in which different T cell subsets were selectively depleted, it became evident that in addition to CD4+TH1 CD8+ sub population of T cells also may play significant role.

SENSORY CONDUCTION VELOCITY DURING COLD PRESSOR TEST (CPT)
The study was conducted to find out interaction, if any, between autonomic responses and pain as produced during cold pressor test and median nerve conduction velocity in the hand. 18 medical students volunteered for the study. They were asked to dip left hand in ice cold water of 0±2°C and pain threshold and tolerance and heart rate, blood pressure measured. Median nerve conduction in opposite hand was measured by orthodromic stimulation of index finger and recording evoked responses at the wrist. This was done before, during and after cold pressor test. The conduction velocity of contralateral median nerve was 57.8±5.1 before and 56.6±5.0 during and 57.0±5.2 M/Sec after CPT. It was significantly decreased during CPT along with amplitude of evoked response. These findings suggest that sympathetic overactivity either due to increased discharge or release of catecholamine or the accompanying pain during CPT interacts with sensory conduction in contralateral median nerve so as to decrease the conduction velocity.
Abs. No. P9FF 02

GLAUCOMA AND AUTONOMIC FUNCTIONS
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The present study was carried out on 30 subjects (40-60 years) ten each of control, primary open angle glaucoma (POAG) and primary angle closure glaucoma (PACG). Investigations were carried out for glaucoma as well as autonomic functions. In each subject after a detailed history, intraocular pressure measurements as well as aqueous humour dynamics were determined. Other investigations included gonioscopy for the type of glaucoma, ophthalmoscopy and visual field charting. Tests of autonomic function comprised of Resting Heart Rate, QTc, Valsalva ratio, S/L ratio, T-wave amplitude (ECG), cold pressor response (CPR) and θ-index of EEG.

It was found that patients with PACG showed a decrease in parasympathetic and an increase in sympathetic activity whereas patients with POAG showed a decrease in sympathetic activity.

Abs. No. P9FF 03

EFFECT OF BR-16A ON ALPHA-2 NORADRENERGIC AND DOPAMINE POST-SYNAPTIC RECEPTOR FUNCTIONING
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BR-16A (Mentat, Himalaya Drug Co.) is recommended for the management of cognitive disorders. While cognition is predominantly subserved by cholinergic mechanisms, adrenergic, dopaminergic and serotonergic systems are also implicated. This study evaluated the effect of BR-16A on α2-noradrenergic and on dopamine postsynaptic receptors its neuroreceptor related adverse effects. Adult male Sprague-Dawley rats received BR-16A in the dose of 200 mg/kg/day. Control rats received a comparable volume of vehicle alone. After 1 month of treatment rats were injected with i.p. clonidine 100 mg/kg (study 1), or i.p. apomorphine, 2 mg/kg (study 2) and were compared for motility in the small open field with internal controls challenged with saline alone. No significant drug x challenge interaction emerged, indicating that BR-16A neither acts through nor exerts potential adverse effects via α2-adrenergic and dopamine postsynaptic receptor systems.
Abs. No. P9FF 04

CYPROHEPTADINE - INDUCED ANTINOCICEPTION IN ALBINO RATS

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Experiments were carried out to study the effects of prolonged administration of high dose of cyproheptadine (CYP) on the nociceptive sensitivity as measured by formalin test. The results indicated that administration of CYP for 7 days produced significant analgesia. This effect was further enhanced when the same was administered for 14 days. CYP facilitated morphine analgesia, whereas naloxone attenuated CYP-induced analgesia, indicating that CYP produced analgesia through the activation of an opioid pain inhibiting mechanism.

Abs. No. P9FF 05

METHANOL ALTERS THE RELEASE OF DOPAMINE FROM RAT BRAIN SLICES-An invitro pulse voltammetric study.

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This work was undertaken to study the effect of methanol (250mg%) on neurotransmitter release (Dopamine) from rat brain slices (Hypothalamus) invitro using pulse voltametry. It was found that dopamine levels increased significantly (P<0.001), indicating a direct action of methanol on the release of dopamine from the brain slices invitro.
Abs. No. P9FF 06

CONCENTRATIONS OF BIOGENIC AMINES IN THE BRAIN
OF EXPERIMENTAL DIABETIC RATS

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Concentrations of Biogenic amines viz. dopamine, norepinephrine, epinephrine, 5-Hydroxy tryptamine, and 5-Hydroxy indole acetic acid was estimated fluoremetrically in various brain regions like hypothalamus, hippocampus, striatum, midbrain, pons medulla, cerebellum and cerebral cortex in normal, untreated alloxan diabetic, insulin treated diabetic and glucose treated rats after one week. Untreated alloxan diabetic and glucose treated rats showed significant changes in some specific areas of the brain. Insulin treated diabetic rats showed no significant change in any of the areas studied.

Abs. No. P9FF 07

FRACTALS OF CHANGING PATTERNS IN EEG.

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Chaotic dynamics is an emerging paradigm for analysis of random looking complex patterns (i.e., EEG) which were traditionally considered to be stochastic in nature. Nonlinear dynamics views such signal patterns as being deterministic and of relatively low dimension with their complexity being due to their inherent nonlinearity. Fractals are the footprints of a chaotic process. The study attempts to quantify EEG through the formalism of nonlinear dynamics. 160 sees of resting EEG with eye closure and eye open was analysed by the standard spectral method to obtain a compressed spectral map. The same data was subjected to fractal dimension measures with a data window moving across the time series. The transitions in the EEG seen in the spectral map are well differentiated in the fractal plot at similar points in time. The running fractal dimension could be seen as an efficient method for quantified EEG analysis.
EFFECT OF ELECTRO-ACUPUNCTURE ON AUDITORY BRAINSTEM EVOKED RESPONSES IN CHRONIC PAIN PATIENTS.
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G.T.B. Hospital, Shadnagar, Delhi-95.

Electro-acupuncture (EA) has been used as effective therapy in pain relief. Its site of analgesic effect is uncertain. The present study shows that EA interacts with generators of waves I, II & III of auditory brainstem evoked responses in the lower brainstem. Seventeen chronic pain patients were the subjects of this study. The pain rating of VAS was 97.65 ± 6.64 before electroacupuncture. They received in all ten sittings of EA, each sitting every other day. On three sittings i.e. 1, V & X, brainstem auditory evoked responses were studied before, during and after EA using standard computerised recording techniques. The values of absolute, interpeak latencies and amplitudes of waves V, I were compared for the three EA sittings. There were significant differences in absolute latencies of waves I, II, III and amplitudes of V, I and their ratio (V:I). These findings suggest that EA does interact with neural generators of lower brainstem auditory evoked potential responses.

MONOAMINERGIC NEUROTRANSMITTER FUNCTION IN ANIMAL MODEL OF BEHAVIORAL DEPRESSION AND THEIR SIGNIFICANCE IN RELATION TO ANTIDEPRESSANT EFFECT OF PHYSICAL EXERCISE.
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Currently, dysregulation of brain monoamines function as proximate cause of endogenous depression is in vogue. Because of several clinical reports on efficacy of exercise as effective therapy for clinically depressed patients, the antidepressant effect of exercise was evaluated on animal model of depression (Katz Model) in terms of brain monoamines function. The important findings are: 1. In depressive rats, deficient presynaptic release of 5HT in prefrontal cortex, hypothalamus and brainstem, diminished release of NE in prefrontal cortex, hippocampus and hypothalamus and likely increase in DA release in prefrontal cortex and brainstem were observed. Chronic swim exercise prevented development of depression accompanied by normalisation of 5HT release in brainstem, stabilisation of NE turnover in prefrontal cortex and hypothalamus and restoration of DA level in prefrontal cortex and hippocampus.
EFFECT OF BACLOFEN ON TONIC PAIN IN MONKEYS
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The role of GABAergic mechanisms in the modulation of descending pain inhibitory system has been suggested by several authors. Increase in cerebral GABAergic activity can influence opiate-induced analgesia. The interaction of endogenous opioids and GABA might be indirect since GABA related analgesia is not blocked by naloxone. The present study aimed to characterize the analgesia produced by GABA agonist Baclofen in monkeys as a part of the ongoing attempt to study the endogenous analgesic mechanism in tonic pain modulation. The effect of various doses of Baclofen was studied as a first step to find out its optimal dose for producing analgesia. Experiments were conducted on four rhesus monkeys. Baclofen in various doses (2, 4, 6 & 8mg /kg) was injected intra peritoneally 30 minutes prior to formalin injection which was used to produce tonic pain. Pretreatment with Baclofen, induced analgesia which varied with the dose injected. Lower (2mg/kg) and higher doses (8 mg/kg) were less effective. The average 1st 10 min. basal pain rating of 1.28 was reduced to 1.01, 0.73, 0.86 and 1.07 with 2, 4, 6, 8 mg/kg Baclofen respectively.
Complete analgesia was observed during 30-35 minute epoch with 4 mg/kg Baclofen, which lasted up to 55 minutes. The optimal analgesic dose of Baclofen thus obtained will be used for further studies on the interaction of various drugs modulating tonic pain. Baclofen analgesia has been suggested to be modulated by both endogenous opiate and non opiate mechanisms. The U shaped analgesic response with gradually increasing doses of baclofen may be due to the involvement of different systems and activation of multiple receptors types.

ROLE OF CALCIUM GRADIENT IN FUNCTIONAL DILATATION IN SKELETAL MUSCLE VESSELS.

The functional hyperaemia was studied in urethane anaesthetized rats and prepared for intravital microscopy in spinotrapezius muscle. Internal diameter of arterioles and venules were measured with micrometer eyepiece. Muscle fibers were stimulated with microelectrode at 4V, 0.1 ms pulse width and frequencies of 1, 3 & 40 Hz. for 1 & 5 sec. Arterioles and venules showed functional dilatation (F.D.) in response to stimulation which were graded with frequency and duration of stimulation. Terminal arterioles and venules showed quicker response.

Calcium channel blockade by Diltilazem abolished the F.D. except for tetanic stimulation. The results suggest involvement of Ca⁺ movement in initiation of F.D. We are able to hypothesize that functional dilatation initiated by passive efflux of Ca⁺ from smooth muscle of vessels. This response is maintained at higher frequencies by release of local metabolites.
DISTURBANCE IN SLEEP - WAKEFULNESS AFTER NEUROTOXIC LESION OF PREOPTIC AREA

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The main evidence for the role of preoptic area (POA) in the regulation of sleep-wakefulness has come from electrolytic lesion studies. But this technique does not provide direct proof for the role of the POA cells on sleep-wakefulness as it destroys not only perikarya but also several axonal pathways which might play some crucial role. The POA was lesioned in male rats with cell specific neurotoxin kainic acid/N-Methyl D-Aspartic acid to study the role of the POA neurons in the regulation of the sleep-wakefulness. Sleep-wakefulness was assessed on the basis of the EEG, EMG, EOG and locomotor activity recordings. These parameters were continuously monitored for 24h, before lesion, and at different intervals after lesion, for three weeks. The destruction of POA neurons resulted in an increase in locomotor activity and wakefulness. On the other hand, slow wave sleep and paradoxical sleep were markedly reduced. There were marked blunting in the diurnal sleep-wakeful pattern.

REM SLEEP DEPRIVATION DECREASES SYNAPTOSOMAL CALCIUM LEVEL

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Rapid eye movement sleep deprivation (REM) affects neuronal excitability, membrane fluidity, neurotransmitter release as well as Na-k ATPase activity and therefore, it is likely that Intracellular calcium level would be affected. Hence, the level of synaptosomal calcium was measured in the experimental, recovered and control rat brain. Flower pot technique was used to deprive the animals of REM sleep for 2 and 4 days. The calcium level was estimated in cerebrum, cerebellum and brain stem by atomic absorption spectrophotometry. Results showed that there was a significant decrease in calcium levels in all the regions of the brain except pons which showed an increase. All the changes returned to the baseline after recovery. The calcium level in the control rat brain synaptosomes was not affected. The finding helps in explaining REM deprivation induced alteration in neuronal excitability.
Abs. No. P9FF 14

ROLE OF MEDIAL PREOPTIC AREA CHOLINEnergIC INFlUENCE ON SLEEP-WAKEFULNESS AND THERMOREgULATION
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Medial preoptic area (mPOA) regulates sleep (S), wakefulness (W) and body temperature (Tb). The role of its adrenergic inputs on those parameters has been extensively studied. In this study the role of mPOA cholinergic inputs on S-W-Tb was investigated on male albino rats. Under surgical anaesthesia bilateral guide cannulae towards mPOA and EEG, EOG and EMG electrodes were fixed. After recovery, S-W and rectal temperature were recorded simultaneously, during day and night, before and after local microinjection (into mPOA) of acetylcholine muscarinic agonist (carbachol) or its antagonist (Scopolamine), respectively. During day carbachol induced wakefulness and hypothermia while at night scopolamine induced sleep and hyperthermia. Thus, the results suggest that the mPOA muscarinic receptors may be involved in sleep-wakefulness and thermoregulation.

Abs. No. P9FG 01

IN VIVO REGULATION OF ESTROGEN AND PROGESTERONE RECEPTOR
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Auto-regulation of steroid receptors has been well documented at the protein level. We have studied the effect of estradiol, progesterone and combination of the two on levels of transcripts for estrogen (ER) and progesterone receptor (PR) in rat uterus.

Total RNA extracted from the uterine horns of ovariectomized rats treated with hormones for different time periods, was hybridized with nick translated and radiolabelled cDNA probes for ER and PR.

An early negative regulation of ER mRNA in response to estradiol is followed by an up-regulation of the receptor transcript. Longer treatment with estradiol has a down-regulatory effect on transcription. Progesterone has little or no effect on the ER regulation. However, animals primed with estradiol show a positive regulation of ER by progesterone. Estradiol treatment up-regulates the PR RNA levels. Long term exposure to estradiol brings down the PR RNA levels to the basal level. This suppression is overcome by progesterone treatment.
ESTIMATION OF ALKALINE PHOSPHATASE IN SEMEN IN RELATION WITH SEMINAL QUALITY.

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Semen analysis was done in Normospermic, Oligospermic and Azoospermic males and the result showed that alkaline phosphatase content of semen bears a direct relation with volume of semen. An inverse relation was observed between grade of motility and alkaline phosphatase. No relationship was observed between alkaline phosphatase level and sperm density as well as motile count/ml. These chemical indicator tests have not yet lost their relevance.

THE RELATIONSHIP BETWEEN PLACENTA AND PARITY OF PREGNANCY.

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52 cases of full term normal pregnancy were studied. The weight of newborn and placenta was determined in each case and history of parity recorded. The placenta weight was then expressed as a percentage of weight of the newborn. The cases were divided into two groups. Group-I(n=24) consisted of primipara and group-II(n=28) of multipara. The mean birth weight (+ S.D.) of newborn was 2611 gms ± 521 and 2728 gms ± 395 in groups I & II respectively and their mean placenta weight was 489.26 gms ± 122.61 and 426.65 ± 53.8 respectively. Weight of placenta expressed in term of percentage of weight of newborn was 18.66% in group I and 15.64% in group II.

A significant different was observed in the weight of placenta in two groups (p<.05) and when the weight expressed as % of birth weight (p<.01). The placenta is known to secrete human chorionic somatomamotrophin in amounts directly proportional to the weight of placenta. This though reaches the fetus in small quantities but influences the growth in the mother. Possibly the greater percentage of weight of placenta in primipara is related to more secretion of the hormone needed for greater maternal development during the first pregnancy.
EFFECT OF SIMULTANEOUS ADMINISTRATION OF TESTOSTERONE PROPIONATE ALONGWITH DIFFERENT DOSAGES OF LEAD IN REPRODUCTIVE ORGANS OF MALE RATS

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Administration of testosterone propionate (TP) along with lead acetate at 2mg, 4mg and 6mg/kg body weight in male rats showed decreased growth and gradual accumulation of lead in all reproductive organs. Further, significant decrease of spermatogonic cell count and serum testosterone levels were observed after treatment. TP treatment alone caused increase of serum testosterone levels and body and testis weights, while there was partial increase of spermatogenic cell counts. On the other hand lead levels in reproductive organs after TP treatment did not show any difference as compared to control. Therefore, these results suggest that the spermatogenic cell response for exogenous testosterone was inhibited due to the accumulation and toxic effect of lead in male reproductive organs.

CYPROHEPTADINE AS AN ANTI-INSULIN AGENT

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Experiments were carried out in albino rats to elucidate the mechanism of cyproheptadine (CPH) as an appetite stimulating agent. There was significant increase of food intake as a result of administration of different doses of CPH. CPH treated animals developed significant hyperglycemia associated with marked depletion in glycogen content of the liver. The present investigation favours the view that impaired utilisation of glucose due to anti-insulin effect of CPH may be responsible for its hyperphagic effect.
STUDY OF PLASMA CORTISOL LEVELS IN TEMPO DRIVERS

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Plasma Cortisol can be a good indicator of stress. Tempo drivers are subjected to all the three types of stress viz physical, mental, invoiørmental. Plasma cortisol was done in drivers and non drivers controls. The drivers were divided in two sub groups - drivers of less than 6 months duration and more than 6 months duration. All the subject were similar in age, height, weight, socio-economic status Plasma cortisol values were found significantly higher in drivers than the control subjects. This increase was attributed to stress.

SOME EXTRAGENITAL EFFECTS OF GESTAGENS ON SUBJECTS OF DYS-FUNCTIONAL UTERINE HEMORRAGE (DUB).

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Different doses of progesterone were administered in patients suffering from D.U.B and their EEG, lung function tests (LUFTs) EEG and change in mood and other psychiological aspects were studied. Their serum progesterone levels were also determined. It has been observed that synthetic oral preparations of progesterone cause voltage drop and alteration of frequency of EEG. It also causes some consistent changes in LUFTs. Serum progesterone (endogenous) level is depressed and changes in EEG develop. Some interesting changes in mood also occur. Obviously progesterone has a large spectrum of activities, although the except fundamental change remains elusive.
THERMAL RADIATION STRESS EFFECT ON SOME ASPECTS OF FEMALE REPRODUCTION OF WHITE LEGHORN HENS.
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Infra red radiation exposure did not significantly affect the age at sexual maturity, 100 days egg production, the clutch size or the weight of eggs laid. However, when male and female thermal radiation-stressed birds were mated with the control male and female birds reared under normal incandescent light regime in a criss-cross breeding programme significant differences in fertility and hatchability percentages was observed between the four groups. The results indicated that the eggs produced by the IR-irradiated females mated with similarly treated males showed a better reproductive potential than those mated with control males. However, the weight of the chicks hatched was lowest in the group where both males and females were exposed to radiation stress and highest in the group where none of the sexes was exposed to stress.

ANTIDIABETIC EFFECT OF KARELA (Momordica charantia)
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Momordica charantia (family Cucurbitaceae, 'Karela') have been regarded to be hypoglycaemic, and the fruits of it are commonly used by diabetics in India. Present study shows the antidiabetic effect of diabetic rats treated with acetone extract of whole fruit powder administered orally (75mg/100gm Body Weight) in lowering the blood sugar level in alloxan diabetic rats. Blood sugar level is reduced from 382.4-13.56mg% to 155mg% within a period of 2 to 3
BIOLOGICAL PROFILE OF EXTRACT OF CROTALARIA JUNCEA LINN.

A.O. Prakash

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In the area of fertility regulation number of indigenous plants of medicinal value have been tested in laboratory animals but most of them failed to show activity at the primary screening level and many others have been dropped due to frank potent estrogenic nature. Extracts of Crotalaria juncea have shown significant antifertility activity in rats. In the present paper its various biological properties have been described to assess its exact hormonal status. Ethanolic extract was evaluated for estrogenic, anti-estrogenic, progestational and anti-progestational activity using standardised protocols. Findings revealed that the extract showed potent estrogenic effect as it increased the uterine wet weight in bilaterally ovariectomized immature rats. Uterotrophic activity has also been confirmed through uterine histology. The administration of extract to mature adult rats showed that it is neither progestational nor anti-progestational.

UPTAKE AND UTILIZATION OF $^{14}$C-GLUCOSE BY NORMAL AND DIABETIC RAT HEPATOCYTES

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Hepatocytes were prepared by perfusing collagenase through normal and alloxan - diabetic rat livers. The viability of hepatocytes was determined by Trypan Blue dye exclusion.

Hepatocytes were incubated with increasing concentration of Glucose containing $^{14}$C - Glucose Cell associated glucose was quantitated by liquid scintillation counting. Hepatocytes were also incubated with 5 mM glucose containing $^{14}$C - glucose for upto 30 min. The radioactivity and glucose remaining in the medium and that which was cell associated was analysed by Paper chromatography and liquid scintillation counting. The effect of insulin on uptake and utilization of radiolabeled glucose was also studied.

While the Vmax of glucose transport of normal and diabetic hepatocytes was significantly different, the Km was unaffected. Initially more than 2/3rds of the label in glucose was degraded and then it started to increase. At 30 min. the label in glucose of normal hepatocytes was higher than that in diabetic hepatocytes.

Our results suggest that hepatocytes initially degrade glucose, and then reutilize the metabolites in the biosynthesis of glucose.
PERIPHERAL PLASMA OESTRADIOL-17β AND PROGESTERONE LEVELS IN HYPOTHYROID-INDUCED FEMALE GOATS.

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ABSTRACT

In five mature female goats, subcutaneous injections of thiourea were given initially at the rate of 100 mg/kg body weight per day for 15 days and subsequently, at the rate of 66.7 mg/kg body weight per day for the next 15 days. Significant reduction in the triiodothyronine (T3) and thyroxine (T4) plasma levels during entire period of thiourea treatment confirmed the successful induction of hypothyroidism. Three animals on day 22 and two animals on day 23 of the thiourea treatment exhibited behavioural oestrus. The symptoms of behavioural oestrus were found weak and the duration of oestrus was observed as 48-50 hrs and 36-48 hrs in the treated and control goats respectively. The plasma oestradiol-17β and progesterone levels in thiourea-treated goats were found significantly (P<0.05) reduced than in the control goats during oestrous cycle. The results of this experiment are in conformity with the hypothesis that, thyroid is involved in maintaining the normal functioning of the ovaries.

OXYTOCIN INHIBITS MALE ACCESSORY GLAND FRUCTOSE SYNTHESIS
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Since oxytocin has been shown to inhibit testicular testosterone synthesis and alter circulating level of glucose, the prime determinants of fructose synthesis, this study was planned to find out if oxytocin could affect fructose levels in seminal vesicles (SV) and coagulating glands (CG) of mouse. Experiments using 0.5, 2.5 and 5 U of oxytocin showed no effect on plasma glucose and serum testosterone levels at either 1 or 3 h. However, 2.5 U of oxytocin significantly lowered basal concentration of fructose in SVCG at 1 and 3 h both. Testosterone at a dose of 1 mg enhanced the concentration of fructose in the SVCG at 1 and 3 h both while 2.5 U of oxytocin inhibited the stimulatory effect of testosterone. Oxytocin did not show any effect on protein content or wet and dry weights of SVCG suggesting that ejaculatory mechanism is not involved. The data suggest a direct inhibitory effect of oxytocin on the fructose synthesis in the SVCG of mouse.
Abs. No. P9FG 14

Toxicity studies of a potent antifertility plant: Pueraria tuberosa DC.

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Acute toxicity studies with the butanolic extract of P. tuberosa, a prospective post coital contraceptive agent was carried out in rats. Its different doses ranging from 400 to 1600 mg/kg were administered to rats. The level of blood, sugar, serum proteins, serum GPT and GOT showed variations within the normal range except at the highest dose. Leucocyte counts and haemoglobin values were within normal limits. Protein content, glycogen content, activity of acid and alkaline phosphatase, adenosine triphosphatase and glucose-6-phosphatase activity showed no significant change except at the highest dose. Significant histopathological lesions were also not observed.

Abs. No. P9FG 15

POSSIBLE MECHANISMS OF BERILLIUM TRANSFER THROUGH PLACENTA IN RATS

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To study the effect of beryllium on early gestation, animals were injected on day 1 to 5 post coitum (p.c.) and for late gestation on day 14 to 20 (p.c.) at 0.316 mg/kg dose (i.v.). Animals exposed during early pregnancy delivered normal pups. Animals exposed during 14-20 p.c. did not deliver the pups but showed foetal resorption when sacrificed on day 24 (EDD). However, those delivered after caesarian. These pups died after 24 hrs. Various biochemical variable measured showed inhibition in the activity of alkaline phosphatase, LDH, SDH and ATPase in liver and kidney of mother. Glycogen content of foetal, maternal liver and placenta showed significant reduction at all the time intervals.
Abs. No. S9NG 01

MECHANISM OF ELECTROMAGNETIC INTERACTION WITH BIOLOGICAL SYSTEMS: AN OVERVIEW; J. BEHARI
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The mechanisms underlying the interaction of electromagnetic fields with biological systems are fairly complex. Broadly it may be categorized into two groups i.e. thermal and nonthermal. While the thermal effects can be simply classified as heating phenomena whereas nonthermal effects are relatively difficult to be explained. In both the cases, the target for the EM field interaction with the biological tissue is the cell membrane. The amount of energy absorbed is dependent on the frequency as well as power density of the EM field, electric characteristics of the tissue and dimensions of the body system under exposure. The biochemical pathway for the transmission of the nonthermal effects is presented.

Abs. No. S9NG 02

THERMAL EFFECTS OF MICROWAVE ON BIOLOGICAL SYSTEMS

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Thermal effects of microwave have been successfully applied in curing inflammation, piles, injury etc. Microwave diathermy is widely used for effective cancer treatment. Studies have been done on the thermal effects of microwave radiation on squirrel monkeys and the following conclusions are drawn: above 3 GHz surface heating is prominent, hot spots can be generated in the frequency range of 500-2000 MHz and relative absorption cross-section values 4 or more can be obtained for frequently occurring exposure conditions. Though thermal effects of microwave used in many therapies, but it has potential to produce other undesired biological effects. This should be kept in the mind while using it as therapy tool.
Extremely low frequency electric field effects on the behaviour of rats.

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Recently there has been an upsurge in the knowledge about the adverse effects of extremely low frequency electric fields (EMF). 50 Hz EMF is a potential health hazard. It modulates the physiological functions of reproduction, cardiovascular, blood and brain, strongly reflecting on the behaviour, progeny, mortality of the rats. These effects were observed in adult male rats exposed to 5 KV/m or 50KV/m for 23 hours a day. The period of exposure continued for seven weeks. The control group of rats received similar handling and housing procedures except for the application of electric field. The effects were more pronounced with 50 KV/m than 5 KV/m exposure. The altered cellular functions may have been mediated probably by neuroendocrine alterations.

ELECTROMAGNETIC POLLUTION. SRI NAGESWARI, K.*
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The sources of non-ionising radiation (NIR) cause electropollution. The NIR spectrum extends from Extremely Low Frequency (ELF) to visible spectrum including laser radiation. A variety of sources like power distribution networks, public transportation systems, electric appliances and electrically heated beds and blankets emit ELF fields. A relationship between childhood leukemia, tumours to ELF fields was found. The RF and microwave portion of electromagnetic spectrum are employed in military uses, communication systems, industry and households. American National Standard Institute limited the exposure dose to 0.4 W/Kg SAR taking care of the frequency dependent absorption of electromagnetic radiation. In the presentation, the results of various studies will be discussed.
SINGLE BREATH DIFFUSION IN INDIAN BOYS AND GIRLS (9-18 YEARS)

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Single breath diffusion capacity of lung (DLCO_{sb}) is an important tool in the assessment of pulmonary functions. DLCO_{sb} was measured using standard methodology (Morgan Transfer Test Model 'C'). 200 healthy children (100 boys and 100 girls), 9-18 yrs of age were selected and their physical parameters recorded. The technique of the test was explained and all the tests were performed with the subjects sitting in a resting state in the morning hours. DLCO_{sb} was calculated with the help of Spiro-data-Dec. (U.K.).

DLCO_{sb} increased with age and height in both boys and girls. Though boys showed an increase in DLCO_{sb} at all age groups it was significantly higher at about 14 years, when compared to girls (p<0.001). This could be attributed to larger lung dimensions in boys.

This study is one of the first on a large number of Indian boys and girls during their growth period of 9-18 yrs. Moreover, post pubertal changes in DLCO_{sb} was also observed. The reasons have been discussed in the text.

A LONGITUDINAL STUDY OF PULMONARY FUNCTION TESTS IN PREGNANCY


The study deals with evaluation of pulmonary function status (Vital Capacity, Forced Vital Capacity, Timed Vital Capacity, Tidal Volume, Inspiratory Reserve Volume, Expiratory Reserve Volume, Resting Minute Ventilation & Frequency of Respiration) in 50 normal pregnant Indian women tested in each month of pregnancy. The obtained values were compared with control values taken 8-10 wks after delivery in the same subject. Prediction equations for the various parameters have been established. The observed values were correlated with the predicted values. The linear increase seen in Tidal Volume, Inspiratory Reserve Volume & Resting Minute Ventilation is very highly significant. The small increment in frequency of respiration is significant and the declining trend observed in Expiratory Reserve Volume is very highly significant. No change is seen in Vital Capacity, Forced Vital Capacity & Timed Vital Capacity. The results suggest that the physiological changes in pregnancy do not induce any mechanical stress on the respiratory efficiency of the pregnant woman.
VENTILATORY PARAMETERS VITAL CAPACITY, FORCED VITAL CAPACITY AND TIMED VITAL CAPACITY IN ELDERLY.

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Standard values and prediction equations of vital capacity, forced vital capacity and timed vital capacity were established and correlated for males and females from Central India. Parameters decline with increasing age. Mean values in females were less than in males. The correlation between observed and predicted values was highly significant showing excellent reliability.

DERANGEMENT IN THE LUNG FUNCTIONS OF RUBBER FACTORY WORKERS


Ventilatory lung functions including PEF 25%−75%, PIFR and PEFR were measured in 670 rubber factory workers of Delhi. The work place environment was analysed quantitatively and qualitatively for inhaled particulates. The lung functions were measured by using ELF (P.K. Morgan, London) where as the inhaled particulate load (SPM) and their different size fractions were measured with the high Volume sampler having five stage cascade arrangements of Kimoto, Japan. Inhaled particulates were also analysed chemically for poly-nuclear aromatic hydrocarbons, sulfates and nitrates by using spectrofluor-photo-meter.

The workers were divided into three groups depending on their nature of work. Group I belonged to packing-loading section, Group II from vulcanisation unit and Group III was working in mixing section.

The results showed that the derangement in lung functions was directly correlated with the quality of the work place environment and to the duration of exposure. The maximum reduction in the lung function was observed in the Group III and minimum in Group I workers. These changes were also substantiated by the Roentgenographic examination of their chest.
BREATHE HOLDING TIMES & AGEING.

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The present study was conducted on a randomly selected 110 apparently healthy subjects of 60 yrs & above age group, belonging to both the sexes (Male 62, Female 26) & of various socio-economic status at Agra. History of any Cardiorespiratory distress of each subject was carefully evaluated & recorded on a predesigned proforma. People on any antihypertensive medication or of any chronic respiratory disease were not included in the study. The study revealed that the average breath holding time (BHT) in males was 28.20±8.51 sec. and in females 26.11±6.63 sec. Breath holding time shows a declining pattern with age in all the groups of males which is statistically significant (p<0.05). However, in females although the BHT also shows an apparently declining pattern with age in all the age groups but the relationship is statistically insignificant (p>0.05).

EVALUATION OF VITAL CAPACITY IN ELDERLY AGE GROUP INDIANS (60 YRS & ABOVE)


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The present study of evaluation of vital capacity-respiratory functional ability, in elderly age group subjects was conducted with the objective to determine the factual data in this segment of population at Agra. The study included 82 Male & 26 Female subjects after making a careful clinical examination of their Cardiorespiratory status.

The study revealed that in elderly (60+) males the average vital capacity was 2334.3±370.3 ml & in elderly females (60+) it was 2206.2±297.5 ml. The vital capacity shows a declining pattern with age in all age groups in males as well as females & the relationship is statistically significant in both the sexes (p<0.01).
**Abs. No. P9NH 07**

**PEAK EXPIRATORY FLOW RATE (PEFR) IN ELDERLY INDIAN SUBJECTS**


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It is imperative to evaluate the functional capabilities of older age group population & hence evaluation of PEFR is undertaken in the present study. 82 Males & 26 Females subjects of 60 yrs & above were included in the study & their elaborate cardio-respiratory assessment was made and recorded in a predesigned proforma.

The study revealed that in elderly Males (60+ yrs) the average peak expiratory flow rate (PEFR) was 254.40±95.70 litres/mt. & in elderly females (60+yrs) 205±41.71 litres/mt. The PEFR shows a declining pattern with age in all age groups except 75+ age group in Males as well as in females. The relationship is statistically significant in both the sexes (p<0.05 in Males & p<0.01 in Females).

**Abs. No. P9NH 08**

**EXERCISE INDUCED BRONCHIAL LABILITY IN NORMAL MEN AND WOMEN - A COMPARISON**

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Normal male (n = 29) and female (n = 39) medical students with a mean age of 19.2 years who were nonsmokers, with no personal history of allergy were studied. The bronchial lability was assessed from peak expiratory flows and forced expiratory spiromgrams taken before, during and upto 45 minutes after a standard exercise using the Harvard steps. Women had a significantly lower (P < .001) resting FVC, FEV1, FEF 25-75 % and PEF as compared to men. Although the exercise lability index was not significantly different in men and women, the latter showed a higher percent increase (P < .02) and a lower percent decrease (P < .02) of PEF during and after the exercise respectively. They also showed a significantly (P<.005) faster recovery to normal. These results suggest that airway dynamics may be better in women than in men. This probably accounts for the lower incidence and morbidity from respiratory allergic disease seen in women as compared to men.
Abs. No. P9NH 09

EFFECT OF GROWTH ON LUNG TRANSFER FACTOR AND ITS COMPONENTS
K.K. MAHAJAN* S.K. MAHAJAN & N. MISHRA

Measurement of lung transfer factor for CO (TLCO) and its constituent components, viz. diffusion capacity across alveolar capillary membrane (Dm) and instant pulmonary capillary blood volume (Vc) were undertaken in 120 healthy non-smoker males by single breath technique. All the three parameters (TLCO, Dm, Vc) showed direct negative correlation with age. While TLCO and Dm showed a significant direct positive correlation with height, there was no correlation between Vc and height. The degree of correlation increased when both age and height were used together than either of them alone for prediction of TLCO_{120}. The prediction formulae (TLCO_{120} = 3.8 + 21H(m) - 0.308 - A) using both age and height has regression value (R) of 0.6479 (p<0.001)

Abs. No. P9NI 01

PEAK EXPIRATORY FLOWRATE AND PHYSICAL FITNESS IN A GROUP OF ATHLETS AND VOLLEY BALL PLAYERS OF NATIONAL SUMMER TRAINING COURSE.
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PATNAIK SAMIRAN
PATNAIK BINAPANI.
S.C.B.MEDICAL COLLEGE, CUTTACK-753 007

Peak expiratory flow rate is an important field test to assess overall lung function. Lung functions and physical fitness are improved with regular practice of athletic exercises. In the present study PEFR and PFI was determined in 109 subjects of age group 18-20 years. Out of which 43 were non-athletes, 39 athletes and 27 were volleyball players. PEFR value is significantly more in volleyball players. PFI, resting pulse rate endurance time show better Cardiovascular fitness and higher aerobic power of VO_{2} max in case of volleyball players.

Key words - PEFR, Indian peak flow meter, PFI, Sports men, Volley ball player.
PSYCHOPHYSIOLOGICAL FUNCTIONS IN LEFT AND RIGHT NOSTRIL BREATHING: AN EVALUATION OF A CONCEPT OF SVARA YOGA.
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According to ancient scriptures of svara yoga predominant left nostril breathing known as Ida or Moon or female svara and predominant right nostril breathing known as Pingala or Sun or male svara differentially effect the functioning of the body and mind. Hence the possibility of influencing the psychophysiological functioning through left and right nostril breathing was examined in the present study. Body temperature, respiratory rate, heart rate, blood pressure and pupillary diameter were the physiological parameters. The indices of speed of information processing, attention, concentration, recall, mathematical ability and mental fatigue were the psychological parameters. These variables were recorded in 10 young male subjects during left and right nostril breathing. None of the physiological or psychological parameters demonstrated any significant difference in left nostril (Ida svara) and right nostril (Pingala svara) breathing.

THE EFFECT OF ADMINISTRATION OF YOGIC EDUCATION PROGRAMME ON QUANTITATIVELY DETERMINED LEVELS OF ANXIETY IN SCHOOL-GOING CHILDREN.
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This study reports the description of and the normative data obtained with a scale of children's Manifest Anxiety Scale (CMAS) adapted from Casteneda et al (1956) for use with sixth to ninth grade children selected from two different schools, one with and other without administration of yoga education programme. A 42-item anxiety scale and an 11-item Lie-scale were administered to 316 children. The overall difference of mean anxiety scores between the children of two schools in different grades was significantly lower by magnitude of more than half SD i.e. -0.79 3D (p < 0.01) for seventh grade, -0.56 3D (p < 0.05) for eighth grade and -1.29 3D (p < 0.001) for ninth grade children undertaking yoga education programme. The intercorrelations between the anxiety scale and the Lie-scale clustered around the zero value. Yoga may thus prove to be useful in reducing the anxiety level in children of different grades.
THE EFFECT OF ADMINISTRATION OF YOGIC EDUCATION PROGRAMME ON RELATIONS BETWEEN EMOTIONAL AND SOCIAL BEHAVIOUR IN SCHOOL CHILDREN.

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This study involved the use of a 67-item questionnaire constructed by Christopher Brand (1972) on school-going children for quantitatively assessment of seven emotional and behavioural scales: Fearfulness (F), Aggressiveness (A), Defendence (D), Social Extraversion (SE), Behavioural Extraversion (BE), Neuroticism (N) and Lie Scale (L). The questionnaire was administered to a total of 316 children in different grades from sixth to ninth selected from two different schools, one with and the other without administration of yogic education programme. The results revealed that relations existed between scales of Fearfulness and Dependence (r=0.52, p<0.001), Aggressiveness and Behavioural Extraversion (r=0.56, p<0.001). Further the children undertaking yoga education scored significantly less on scales of aggressiveness, behavioural extraversion and neuroticism. Scores on lie-scale, however, were not significant statistically.

EFFECT OF LOW PITCHED OM RECITATION ON SELECTED PSYCHO-PHYSIOLOGICAL PARAMETERS

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Effect of Low-pitched Om recitation on selected psycho-physiological parameters were studied on ten students of G.S. College of Yoga. Five separate students acted as controls. Twenty rounds of Omkar were recited collectively by the experimental group daily in the morning and evening sessions. Pulse rate, Basal Skin Resistance, GSR, Attentional span, Attentional Fluctuation and Neuroticism were measured before and after the 15 days Omkar recitation. Within the experimental group, changes in Basal Skin Resistance, GSR and the Neurotic behaviour were statistically significant. However, no significant changes were evident in Attentional Span, Attentional Fluctuation and Pulse Rate. No significant changes were observed in any of the five parameters in Control group.
MANAGEMENT OF EPILEPTICS BY SAHAJA YOGA

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The study aimed to evaluate the possible beneficial effect of Sahaja Yoga practice as an adjunct to pharmacological treatment in the management of epileptics. Thirty-two patients of primary idiopathic epilepsy aged 15-35 years of age were studied in three groups: group I practised Sahaja Yoga for 6 months, group II practised exercises mimicking Sahaja Yoga for 6 months and group III served as the control epileptic group. The clinical improvement was evaluated by changes in seizure frequency and seizure duration. The parameters of EEG, Auditory evoked potentials, Brainstem auditory evoked potentials (BAEPs), mid-latency response (MLR), Visual Contrast Sensitivity (VCS), Galvanic Skin Resistance (GSR), Palmar Skin Temperature (Ts), Blood lactic acid (B-LA) and urinary vanillyl mandelic acid (U-VMA) were investigated initially (0 month), at 3 months and at 6 months. Sahaja Yoga practice led to a decrease in seizure frequency and seizure duration. Power spectral analysis of EEG revealed a shift in frequency from 0-7 Hz to 8-20 Hz. There were changes in delta (D), theta (T), alpha (A) and beta (B) powers of EEG following Sahaja Yoga practice. % A power increased and % D power decreased. The ratios of A/D, A/(D + T), A/T and A/(D + T) were increased following Sahaja Yoga practice. There was an improvement in VCS at all the spatial frequencies tested. There was an increase in GSR and a decrease in B-LA and U-VMA levels. However, there were no significant changes in BAEPs, MLR and palmar Ts following Sahaja Yoga practice. Group II and III subjects did not show any significant changes in any of these parameters at 3 and 6 months as compared to the initial values. Sahaja Yoga practice led to clinical improvement in epileptics. This is in confirmation with the findings of electrophysiological and biochemical parameters.

INTEGRATED TEACHING IN PHYSIOLOGY AND BIOCHEMISTRY

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The impact of integrated teaching in Physiology and Biochemistry on students' learning and performance was evaluated. Endocrinology was taught to 1988 batch of MBBS students by following an integrated schedule of biochemical and physiological aspects of endocrinology in a sequential manner by Specialist Physiology and Biochemistry teachers. The post schedule assessment was done and was compared with the similar assessment done in 1987 batch which was taught endocrinology separately and independently by the two departments. The performance of 1988 batch was much better and statistically significant. The results will be discussed.
A CROSS-SECTIONAL STUDY OF ANTIBACTERIAL PRESCRIBING PATTERN IN AN 800-BEDDED HOSPITAL.

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Of late, much attention is focussed on Antibacterial Drug utilisation. Antibiotic audit, as many Western studies have now proved, is a method of influencing antibiotic prescribing in hospital practice. A questionnaire-based cross-sectional study of Antibacterial Prescribing Pattern was conducted in St. John's Medical College Hospital (800-bedded), Bangalore, in July 1992. The antibacterial drug utilisation was found to be 56%. Gentamicin (17%), Metronidazole (9%) and Ciprofloxacin (9%) were the most commonly used agents by all the specialties. In all, 39 different antibacterials were prescribed. 34% were empirical, 28% were directed and 32% were prophylactic. 83% of the prophylactic prescriptions were for surgical indications and most often given for more than 72 hours. This study can be a pilot project to run a continuous antibacterial audit in an in-patient setting.

A NEED BASED MEDICAL EDUCATION

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Needs can be felt needs & unfelt needs by community & faculty. Innovative methods to improve medical education by developed & underdeveloped countries have brought changes in medical education. Currently it is re-orienting medical education towards community health care. We are wiser to have learnt that there is no ideal curriculum. Since curricular needs change with time e.g. China with Barefoot doctors & Kerala with higher female literacy rate. Poor doctor patient ratio & urban rural dichotomy in medical care still exist. Urban enjoying medical care & rural only primary care with substandard Primary health centres. Doctors trained at great cost & great numbers like to go abroad so called Braindrain. An efficient doctor with no feelings & money on mind is a deadly combination for society. Christian Medical College, Ludhiana, 50 years ago was producing exemplary doctors. A group of International medical missionaries with innovative methods did the miracle.
Performance of a batch of 65 students admitted on the basis of CBSE premedical test (n=10) and Delhi premedical test (DPMT) (n=47) was compared at the end of the Physiology course during the preprofessional 1st MBBS examination. None of the students who had entered on the basis of CBSE premedical test had obtained more than 70% marks but 12.7% of student entered on the basis of DPMT had more than 70% marks. 22.2% of students in the former group had obtained between 61-70% marks and 44.4% had obtained between 51-60% whereas 42.6% of students in the latter group had obtained between 61-70% marks and 36.2% in the range of 51-60% marks. The students entered on the basis of CBSE test had come from the States in Northern India and Union Territory except Delhi. On the basis of analysis it appears that a factor of pretraining presumably influences the performance of the students. It is suggested that adequate attention to pretraining before the entry into the medical colleges could be used to improve the performance of students who subsequently enter against reserved seats.

P9NJ 04

PRETRAINING INFLUENCES PERFORMANCE OF THE UNDERGRADUATE STUDENTS

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EFFECT OF RAPID EYE MOVEMENT SLEEP DEPRIVATION ON RAT BRAIN Na-K ATPase ACTIVITY

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Since rapid eye movement sleep deprivation has been reported to affect the neuronal excitability in the brain, it was hypothesized that a change in the neuronal membrane bound Na-K ATPase activity might be at least one of the factors for inducing such a change. Therefore, in this study rats were deprived of REM sleep by using platform technique and the enzyme activity was estimated in the whole brain as well as in different regions of the brain in whole brain homogenate and also in the microsomal preparation. Deprivation for varying period was continued and suitable control experiments were conducted to rule out the possibility of nonspecific effects. The observation supported our hypothesis and showed that the deprivation primarily increased the enzyme activity in the rat brain. Besides, it showed that the pons and medulla were the first sites to be affected on deprivation.
Abs. No. P8FC 13

Effect of 1-Methyl-4-phenyl-1,2,3,6-tetrahydropyridine on enzyme activities of succinate dehydrogenase and lactate dehydrogenase in mouse brain

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The effect of neurotoxin, 1-Methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP), on the two selected key enzymes of the energy metabolism of basal ganglia (BSL) and rest of brain (RB) of mice was studied. The experimental animals were injected MPTP (i.p.) at a dose of 20 mg/kg bw at one hour interval each for three consecutive hours. Biochemical estimations of succinate dehydrogenase (SDH) and lactate dehydrogenase (LDH) were carried out as number of injections [1, 2, 3] and at time intervals of [(15, 30, 60, 90, 120, 240); (30, 60); (30, 60, 90, 120, 240) min(s)] in both BSL and RB. Both these enzymes are altered by the neurotoxicity of MPTP. After 1st injection, a trend towards decrease was observed in the BSL and RB in SDH activity. In case of LDH, the activity was found increased in RB and decreased in BSL. After 2nd injection, the activities of SDH and LDH both followed a pattern of initial decrease and then an increase in BSL whereas in RB the activity first increased and then decreased. After 3rd injection, the SDH activity was decreased in BSL with an increase in RB. The activity of LDH showed an increase in BSL and RB. The overall decrease in the activity in RB is supported by the degeneration of BSL which might be due to low oxygen consumption of the tissue. The increase in SDH activity in RB suggests that as all parts of the brain are affected by the toxicity of MPTP, the feedback mechanisms may be acting via RB to overcome the destruction produced by MPTP in the tissue. In case of LDH, the enzyme activity showed the trend of overall increase which suggests the relationship between the energy supply and energy demand in the experimental animal treated with MPTP.