

normal pregnancy & pregnancy induced hypertension using color Doppler indices and to search for correlations between these blood flow changes & fetal growth patterns.

Method : Total 50 pregnant subjects, aged 24-32 years with 28-34 weeks of gestation were selected and divided in two groups, group A of normal pregnant females (n=25, controls) and group B of pregnancy induced hypertensives (n=25, cases). Blood pressure recording, complete hemogram and urine analysis was done in all subjects. Ultrasound modality was used to assess fetal growth using BPD (Biparietal diameter), HC (Head circumference), AC (Abdominal circumference), FL (Femur length) parameters and blood flow by using doppler indices - PI (Pulsatility index), RI (Resistivity index) and SD ratio (Systolic diastolic ratio) in umbilical, uterine and middle cerebral artery. Effective fetal weight was estimated through in-built computer in ultrasound machine and compared.

Results : Highly significant differences were found in doppler indices in umbilical artery (PI>RI>SD ratio) between Gp. A & Gp. B. Less significant differences were found in middle cerebral artery doppler indices in between two groups. No significant difference was found in uterine artery doppler indices. Assessment of fetal growth patterns was done. In Group A effective fetal weight in all subjects was found to be in between 10th-90th percentile. Neither any abnormal doppler indices nor any intrauterine growth retardation was seen in controls. Out of 25 pregnancy induced hypertensives subjects, 5 had intrauterine growth retardation. In 5 subjects showing intrauterine growth retardation, all the 5 (33%) showed abnormal umbilical artery indices, 4 (26%) of them

showed abnormal uterine artery indices and 2 (16%) of them were associated with abnormal middle cerebral artery indices.

Conclusion : Significant changes are seen in values of doppler indices in pregnancy induced hypertensives as compared to that of normal pregnant females suggesting more impedance to uteroplacental blood flow in pregnancy induced hypertensives. Umbilical artery doppler indices were found to be the most sensitive indicator of uteroplacental and fetoplacental insufficiency.

Abs.EP.01

Comparison of Respiratory Function of Antenatal Cases Living in High Altitude and Plains

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Objective : To determine whether the pulmonary function varies in antenatal cases living in high altitude and plains.

Method : 60 healthy uncomplicated antenatal cases in II trimester irrespective of either primi or multigravida within the age group of 20-30 yrs (30 cases residing at altitude of about 2268 meters from the sea level and 30 cases residing in plains) were taken for this study. Height, weight and BMI were measured and Pulmonary Function Test was done using a computerized Spirometer in sitting position. Peak Expiratory Flow Rate (PEFR) values are taken as a predictor of PFT in these antenatal cases. The values are statistically analyzed by "Unpaired Student-T Test".

Results : In the present study it was found that the mean value of PEFR <80% (20.66) for antenatal cases living in high altitudes was more than that of antenatal cases living in plains (PEFR<80% {17.8}). There was a statistical significant decrease in pulmonary function test of pregnant women living in high altitude (P<0.05).

Conclusion : From this study, it was concluded that respiratory function of healthy uncomplicated pregnant women is influenced by altitude of the residence.

Abs.EP.02

Hypoxic Acclimatization as a Risk Factor for Exercise Hypertension in High Altitude

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Objective : As a pilot study attempts were made to conceptualize that hypoxic acclimatization can be a risk factor for exercise hypertension (rise in systolic pressure to 250 mmHg or greater and in diastolic pressure by 15 mmHg, during exercise) in high altitude. This may be due to impaired ability for relaxation of endothelial cells of large blood vessels out of increase viscosity, polycythemia in high altitude natives (HAN). As exercise hypertension is considered only to athletes for medical evaluation, same may encountered in HAN. Hence, attempt has been made to include HAN compared to lowlander similar to athletes.

Method : Two groups (each of 25) of lowlanders and HAN were subjected to

exercise in tread mill for 30 to 40 minutes. Blood pressure was measured before, during and after the exercise.

Results : The incidence of exercise hypertension was higher in HAN compared to lowlanders, the former by 16% and later by 4% of the total number of subject evaluated in each group. The resting mean arterial blood pressure was observed to be higher in HAN.

Conclusion : Since chances of increase in resting blood pressure could get enhanced due to exercise hypertension in HAN or especially in lowlander defense personnel engaged in HA duty, it seems that estimating exercise hypertension may be included as part of medical evaluation for such subject, so that cellular target for preventive therapies can be advocated. The aforesaid pilot observation indicates a positive result in the ongoing study, as we continue our evaluation with more number of subjects.

Abs.EP.03

Systemic and Pulmonary Hemodynamic Responses to Acute Normobaric Hypoxia in Subjects Susceptible to High Altitude Pulmonary Edema (HAPE)

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Background : To verify the presence of constitutional abnormality implicated in the pathogenesis of HAPE, we evaluated the pulmonary and systemic hemodynamic responses to acute hypoxia in HAPE susceptible (S) and control subjects (C).

Methods : HAPE -S group had 10 males with

past history of HAPE whereas C group included 4 males with history of repeated exposure to high altitude without suffering HAPE. Baseline cardiorespiratory parameters for both groups were recorded and were subjected to acute normobaric hypoxic stress (12% O₂) for 30 min. in single exposure.

Results : HAPE -S showed a significant increase in pulmonary artery pressure (40.8 ± 2 vs 27 ± 3.05 mm Hg) compared to C (27 ± 3.05 vs 23.5 ± 2.56 mm Hg) during hypoxic exposure from basal level. Basal systolic blood pressure (121.5 ± 2.89 vs 115.25 ± 2.05 mm Hg), diastolic blood pressure (69 ± 2.99 vs 64.75 ± 2.01 mm Hg) and heart rate (63.5 ± 3.32 vs 57 ± 2.85 beats/min) were significantly higher among HAPE-S as compared to C. HAPE- S showed a significant fall in peripheral oxygen saturation (67.625 ± 2.44 vs $98.7 \pm 0.414\%$) compared to control (76.75 ± 1.97 vs $98.75 \pm 0.62\%$) from basal level.

Conclusion : It may be concluded that HAPE -S have a constitutional abnormality, which can be evaluated at low altitude by giving hypoxic stress.

Abs.EP.04

Identification of Biochemical Markers for Differential Performance to High Altitude Stress

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Objective : Exposure to high altitude is a well

known environmental stress with physiological and metabolic consequences. Such disruptions in cellular homeostasis elicit several acute and chronic organic adaptations designed to diminish the stress imposed by the hypoxic insult. Certain genes have been identified to play a role in imparting tolerance to stress. The present study tries to evaluate various biochemical markers for differential response to high altitude stress.

Method : Adult male Sprague Dawley rats were exposed to an altitude of 9754 m at 32°C, and screened on the basis of their gasping time (GT) and accordingly divided into 4 groups (n=6, per group), Group I: Unexposed control (C), Group II: Exposed Normal (N, GT: 10-25 min), Group III: Tolerant (T, GT : > 25 min) and Group IV: Sensitive (S, GT < 10 min). Parameters evaluated for differential response in the perfused tissues were: indicators of oxidative stress/antioxidants ROS, NO, MDA, SOD, Catalase and HIF1- α regulated genes-EPO, HO-1, VEGF in heart and the hepatic metabolic enzymes G6PD, CS, HK and LDH.

Results : Animals sensitive to hypoxic stress had almost three fold higher levels of ROS and lipid peroxidation as compared to tolerant animals. The intracellular enzymatic antioxidants such as SOD and Catalase and anaerobic metabolism enzymes, LDH and HK were significantly higher in the tolerant rats as compared to the other groups. While tolerant animals had higher levels of HO-1 and EPO, susceptible animals showed higher VEGF levels.

Conclusion : The observations indicate that higher levels of intracellular antioxidant and anaerobic enzymes, and HIF-1 α regulated genes such as HO-1 and EPO may be

responsible for increased tolerance to hypobaric hypoxic stress.

Abs.EP.05

Effect of Electromagnetic Waves Emitted from Mobile Phone on QT Interval Variables of ECG and Rate Pressure Product

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Objective : A wireless communication product i.e., mobile phone (MP) is very important part of the daily life. The electromagnetic waves (EMW) emitted from MP produce thermal, neurological, autonomic and circulatory changes. So it was planned to study the effect of EMW emitted from MP on QT interval variables of ECG and rate pressure product (RPP).

Method : Study was carried out in healthy male subjects in the age group of 18–40 years and was divided in 2 groups i.e., (a) MP nonusers group and (b) MP users group. Subjects having hypertension, diabetes, mental abnormalities, acoustic disorder and computer professionals were excluded from the study. ECG was recorded in Lead II for 5 min before and after listening to MP (1800 MHz frequency, band GSM type, and model Panasonic GD 75) which was held near to ear for a period of 30 min on Polyrite D system. Blood pressure was recorded by sphygmomanometer.

Results : R – R interval ($P < 0.001$), QTc ($P < 0.05$), P wave ($P < 0.001$) of ECG and RPP ($P < 0.001$) were reduced in MP nonusers group when they were exposed to EMW emitted from MP compare to basal level (before

exposure). In MP users group, R – R interval was reduced ($P < 0.001$) and RPP was raised ($P < 0.001$) significantly on exposure to MP. When nonuser and user groups were compared before exposure to MP, R – R interval was more ($P < 0.05$), P – R interval and QRS interval were less ($P < 0.001$) significantly in user group. After exposure to MP, R – R interval and RPP were found to be more ($P < 0.001$) in user group compared to nonuser group.

Conclusion : So it is concluded that EMW emitted from MP produces effect on different variables of ECG and RPP in both MP nonuser and user group.

Abs.EP.06

Physiological Evaluation of Vortex Cooling System Under Heat Stress

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Objectives : Vortex cooling system (VCS) is designed to provide cooling comfort for troops deployed to a micro-environment of high ambient temperature. Vortex tube works under Bernoulli's Principle and the usage of vortex tube is functioning as an integral part of the cooling system for Nuclear Biological and Chemical (NBC) protective ensemble. The study was aimed for 'physiological evaluation of vortex cooling system under heat stress.

Method : Study was carried out in Human Climatic Chamber [HCC] simulated for heat

stress (Dry Bulb 45°C, RH 30%), to assess its cooling efficiency. Study was conducted in three phases viz, 1) Optimization of cooling power of the vortex tube with compressed air. 2) Integration of Vortex tube with the NBC protective ensemble and 3) Performance evaluation of ensemble in simulated heat stress with human volunteers. They were divided into "Control" and "Experimental-group". Experimental-groups were exposed to the simulated HCC with VCS functional (with cooling) and control-group underwent the exposures with VCS gadgets but not functional (without cooling). The duration of exposure under simulated condition was decided up on a exposure termination criteria. The Criteria for the termination of experiment was determined either Oral Temperature reaching 38°C or Mean Skin Temperature reaching 36.6°C or Heart Rate reaching 160 beats per minutes or Subjects' feeling of intolerance to continue heat exposure.

Results : air flow for vortex tube optimized of 3.5–4.5 kg f/cm input. On human exposure In experimental group physiological variables recorded at the end of exposure were 36.9±10.1°C, 36.2±0.3°C and 76±4 bpm with respect to oral temperature, skin temperature and heart rate. The sweat rate record the duration was 248±75 gm/m²/hr all these physiological variables recorded were significantly low (P<0.5) in comparison with control group.

Conclusion : The performance of vertex tube is optimized for a input of moisture & oil free Non-Pulsating-compressed air at a gauge of 3.5–4.55 kg/sqcm with an air flow of 340–380 L/min it yields for 19±1°C cooled air and exhausted out 89±3°C hot air. The VCS

provides effective cooling comfort for volunteers exposed for 34°C WBGT for a duration of 60 min. Physiological variables viz. core temperature, mean skin temperature, heart rate and mean body temperature were within the physiological limit during exposure. The sweat rate was remarkably less in volunteers exposed with Vortex cooling system than the control group. The present study also envisaged further modification of VCS into a stand-alone man mounted cooling system and that will ensures more comfort for the user in certain specialized working destinations viz, crew compartments and onboard ship.

Abs.EP.07

Oxidative Stress as a Possible Inducer of Infertility in Diazinon Treated Rats

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Introduction : Diazinon, an organophosphate pesticide is known for its adverse action on male and female fertility. In previous reports, it has been noticed to induce a decline in sperm count with an increased abnormal sperm morphology and a possible infertility in experimental rats. The causes for infertility on exposure to pesticide compounds are multifactorial. There are no studies in relation to diazinon and its oxidative stress related mechanisms.

Objective : Objective of the present study was to evaluate the oxidative stress and antioxidant enzyme status on exposure to low doses of diazinon.

Methods : Adult male Sprague-Dawley rats were divided into control and treatment (oral gavage, n=6) groups for three durations –1, 2 and 8 weeks. After the scheduled last exposure, rats were anesthetized, blood was collected and testis were removed carefully. End product of lipid peroxidation, malondialdehyde, catalase, and reduced glutathione and testosterone levels were measured. Possible testicular marker enzyme levels were also measured.

Results : Malondialdehyde was significantly increased in the testis. Levels of catalase and reduced glutathione were significantly decreased. Aspartate aminotransferase, alanine aminotransferase, alkaline phosphatase and lactate dehydrogenase activities were significantly elevated. Decreased testosterone levels were recorded.

Conclusion : Results of present study confirm that oxidative stress as a major causative factor for a possible decline in spermatogenesis in the testis on exposure to diazinon.

Abs.EP.08

Diazinon Induces Hepatotoxicity By Biochemical and Histological Alterations in Wistar Rats

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Objective : Diazinon an organophosphate was known to have negative health effects in animals and human beings. Presence of pesticide residues in the environment,

vegetables and food products indicate an alarming signal and need to be assessed scientifically at preclinical levels. There are limited reports about diazinon on hepatotoxicity when exposed at low doses. The objectives of this study were evaluation of possible biochemical and histological mechanisms involved in the initial toxicity of diazinon on liver functions

Method : Adult male Wistar rats segregated into (n=6) one control and six diazinon treatment groups with 6 mg, 7.5 mg and 10 mg/kg body weight for 5 and 30 days duration separately. Diazinon groups were treated orally in a gap of 24h.

Rats were sacrificed 24h after the last treatment. Blood was collected and centrifuged to obtain serum. Liver was removed and fixed in Bouin's fluid, processed in series of graded ethanol and embedded in paraffin for histology. Paraffin sections were cut into 5 µm thickness and stained with hematoxylin and eosin for light microscopic examination. The serum was used to evaluate the level of AST, ALT, HDL, LDL, LDH, ALP, cholesterol, triglyceride, total protein, albumin, and Ach-esterase activity. One way ANOVA was used to analyze the data.

Results : Diazinon resulted in a decline in ach-esterase activity, albumin, total protein levels and rise in AST, ALT, HDL, LDL, LDH, ALP, cholesterol and triglycerides levels significantly. Histologically hepatocytes were swollen, vacuolation and fatty changes were seen in diazinon treated groups.

Conclusion : Low doses of diazinon induces biochemical derangement and hepatocytes malfunction in Wistar rats.

Abs.EP.09

Bisphenol A Toxic Chemical Released From Plastic, Produces Cardio-respiratory and Renal Changes in Rats

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Objective : Bisphenol A (BPA) is used in the manufacturing of plastics and in India it plastic material are used indiscriminately. Therefore, the present study was undertaken to see the toxic effects of plastic lynched water and BPA on the cardio-respiratory parameters and structural changes in kidney, heart and lungs in rats.

Methods : Experiments were performed on 3 group of adults rats (n=6; each group). ECG and respiratory excursions were recorded in each group at the beginning of study. In group I (control), rats were allowed to drink tap water for 30 days and rats in group II were given BPA (2 µg/kg body weight/day) orally, whereas in rats of group III, plastic lynched water was given ad libitum. After 30 days, the ECG, blood pressure and respiratory excursions of these rats were recorded and the kidneys, lungs and heart were studied for the histological changes.

Results : The heart rate decreased significantly in both BPA treated and plastic lynched water treated group. Mean arterial pressure decreased significantly in case of plastic lynched water treated group and there were significant histological changes in heart

depicted rupture of myofibrils with edematous changes; in lungs emphysematous changes with colloid deposition; and in kidneys, decrease in number and size of glomeruli along with colloidal deposits and lymphocytic infiltration.

Conclusions : Present results demonstrate toxic effects of plastic lynched water when exposed chronically and the toxicity was greater than that seen in BPA alone group on the cardio-respiratory and renal systems in rats.

Abs.EP.10

Comparison of Ventilatory Acclimatization Parameters in Lowlanders and Tibetans (Born and Brought Up Near Sea Level) at High Altitude

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Objective : The adaptation to high altitude in native highlanders may be genetic or it may be related to duration of exposure to high altitude. In case the adaptation is genetic, native highlanders born and brought up near sea level may have different acclimatization patterns compared to lowlanders. The aim of the present study was to compare ventilatory acclimatization parameters and the incidence of acute mountain sickness (AMS) between lowlanders and Tibetans (born and brought up near sea level) on acute and sustained exposure to hypobaric hypoxia at high altitude.

Methods : The study was conducted in Leh at 3300 m above sea level and mean atmospheric pressure of 540 mmHg. 29 lowlanders were compared with 17 Tibetans. Assessment of SpO₂, EtCO₂, respiratory rate, heart rate, blood pressure and AMS scoring was done on first 6 days after arrival at Leh.

Results : Significantly greater values of EtCO₂ and SpO₂ were found in Tibetans compared to lowlanders the second day onwards. The Tibetans had a lower HR response and greater increase in BP than the lowlanders. None of the Tibetans and 5 lowlanders suffered AMS.

Conclusion : Tibetans showed a smaller increase in ventilation and limited alkalosis, maintained higher oxygen saturations and had a lesser incidence of AMS compared to lowlanders. These features suggest that Tibetans are adapted to high altitude. This adaptation confers a benefit on ascent to high altitude in Tibetans born and brought up in the plains.

Abs.EP.11

Extended Darkness Induced Macromolecular Damage in Blood and Muscle Tissue

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Objective : Photoperiodic changes causes disruption of the normal circadian rhythm and prolonged darkness induced altered circadian rhythm may affect the hormonal secretion, which might lead to metabolic disturbances. Changes in the metabolic status have been

reported to be associated with alteration in antioxidant levels, tissue injury and hence oxidative stress.

Oxidative stress has been implicated with macromolecular damage and changes in motor activity. Hence, this work was carried out to determine whether alteration in photoperiodic conditions by exposure to extended darkness causes any macromolecular damage.

Method : Twelve, young, male wistar rats were randomly divided into control (6 rats, 12:12 L/D cycle, normal photoperiod) and experimental group (6 rats, 1:23 L/D cycle, altered photoperiod). Food intake, body weight was monitored regularly, motor activity was noted weekly and after the study period of 30 days, rats were sacrificed and plasma and skeletal muscle samples were collected for estimation of lipid peroxidation and protein carbonyls.

Results : Decreased body weight was observed in experimental rats at the end of the study with a prominent decline in the second week though there was no overall change in food intake in between the groups. Exposure to extended darkness caused a three-fold increase in plasma and muscle lipid peroxidation, a two fold increase in plasma and muscle protein oxidation along with a significant reduction in motor activity.

Conclusion : Therefore, this study shows an enhanced macromolecular damage on exposure to extended darkness induced altered photoperiodicity.

Abs.EP.12

Cold Pressor Response in Indian High Landers Versus Low Landers

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Objective : Bio organisms including humans are innately endowed for adaption to extremes of rigours of geoclimatic vicissitudes. The highlanders (HL) face a dual challenge of hypobaric atmosphere and cold weather. In present study we compared the blood pressure responses to cold pressor Test (CPT) in highlanders and lowlanders.

Method : This study comprised of HL (residing since birth at a height of 5000-6000 feet and above) and LL (1st year medical students of CSM Medical University, Lucknow) males and females, aged 18-24 years. Subjects were asked to relax on a couch for 15 min; then their Basal Systolic (SBP) and Diastolic Blood pressure (DBP) were recorded by a slanted cold pressor test from right hand. Then subjects were asked to immerse their left hand in bowl filled with ice cold water (0-4°C) for 1 min. SBP and DBP were again recorded from right hand. Data was analyzed by one way ANOVA test.

Results : In LL blood pressure responses to CPT showed statistically significant rise in SBP, DBP and in their percent increments. HL showed similar trend of rise in SBP, DBP and percent increment to CPT (statistically insignificant). The CPT in females of both groups (HL and LL) showed greater vasoreactivity than men.

Conclusion : Blood Pressure responses to cold are directly influenced by gender and altitude

(grade of ambient temperature (00-100 > 100-140). Adaptive mechanisms are more pronounced for rising ambient temperatures and less pronounced for cold.

Abs.EP.13

Effect of Intermittent Hypobaric Hypoxia on Drug Clearance

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Objective : Limitation of oxygen at high altitude may compromise metabolism of drugs. The study aims to understand the effect of high altitude environment on drug metabolism.

Method : Effect of intermittent hypobaric hypoxia on phenotypic expression of anesthetic drugs pentobarbitone, thiopentone and zoxazolamine (sleeping time) was assessed in rats exposed to 282.4 mm Hg equivalent to 25000 feet in a decompression chamber. Plasma clearance of some commonly used drugs was investigated in rabbits exposed to 429 mm Hg equivalent to 15000 feet. Pharmacokinetic parameters were computed by plotting drug concentration versus time curve on semilog scale.

Results : A significant delay in regaining rightening reflex was observed in rats exposed to intermittent hypobaric hypoxia in response to pentobarbitone and thiopentone sodium. Pharmacokinetics of acetyl salicylic acid, gentamicin, phenobarbitone and acetazolamide showed increase in plasma half life ($t_{1/2}$),

decrease in elimination rate constant (k_{el}) and hence prolonged residence of these drugs in hypoxic animals.

Conclusion : It is concluded that hypoxia alters therapeutic effectiveness and clearance of drugs.

Abs.EP.14

Physiological Effect of Yogic Practices on Young Indian Students : A Comparative Approach

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Objective : To compare body mass index (BMI), physical characteristics, aerobic and pulmonary capacities of Yoga Diploma Course Students (YS), who practiced yoga for one year prior to the study, with Research Fellows (RF), who never practiced yoga.

Method : Sixty eight (N=68) healthy young volunteers within the age range of 23–29 years participated in the study, which included 19 male (n1=19) & 17 female (n2=17) YS and 20 male (n3=20) & 12 female (n4=12) RF. Standing height, weight, dynamic lung function tests [including forced vital capacity (FVC), forced expiratory volume in 1st second (FEV1), maximum voluntary ventilation (MVV) and peak expiratory flow rate (PEFR)], hand grip strength (HGS), back leg strength (BLS) and maximal aerobic capacity (VO_2^{max}) were recorded. BMI was calculated using standard formula.

Results : VO_2^{max} of male and female volunteers from YS was significantly higher ($P<0.05$ & $P<0.001$ respectively) than RF. MVV of male and female participants from YS was significantly higher (both $P<0.05$) than RF. PEFR of female YS was significantly higher ($P<0.05$) than female RF; though, PEFR values of male YS and RF did not show any significant difference. BLS of male and female volunteers from YS was significantly higher (both $P<0.05$) than RF. No significant difference was observed in BMI, FVC, FEV1 and HGS between male and female YS and RF.

Conclusion : The present study showed better physical performance in YS as compared to RF. It could be recommended that yoga as a physical fitness regime should be considered for any health benefit programme.

Key words : Physical performance, aerobic capacity, lung function, muscular strength.

Abs.EP.15

Rapid Acclimatization to High Altitude by Intermittent Hypoxic Exposure in Military Operations

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Objective : Due to emergencies/war like conditions, rapid deployment of military personnel into high altitude frequently occurs. Rapid deployment to high altitude especially very high altitude or extreme altitudes soldiers

are at risk of developing acute mountain sickness (AMS). Altitude acclimatization is the best strategy for the prevention of AMS and allows people to achieve the maximal physical and cognitive work performance. A recent approach to induce altitude acclimatization is use of daily intermittent hypoxic exposure (IHE) in lieu of continuous residence at high altitudes.

Method : There were 14 healthy army volunteers who were exposed to normobaric hypoxia 13% for two hours intermittently (5 min hypoxia followed by 5 min normoxia) for initial two days followed by 12.5% for next two days at sea level. On the fifth day the subjects were air lifted to Leh (3500 m). The predetermined primary outcome was measured by the Lake Louise AMS Score of 3 or more. The other secondary outcome measured included pulse oximetry, heart rate, blood pressure, pulmonary arterial pressure.

Results : Intermittent hypoxic training at sea level was effective in preventing AMS. Hypoxic exposure at sea level induced altitude acclimatization by increased arterial oxygen content through ventilatory acclimatization.

Conclusion : Intermittent hypoxic exposure may be considered as an alternative approach to induce the altitude acclimatization at low altitude based soldiers before their deployment to high altitude operations.

Abs.HE.01

Effect of Iron Status on Iron Absorption in Different Habitually Consumed Meal in Young South Indian Women

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Objective : To determine Iron (Fe) absorption from a range of commonly consumed South Indian meals and to evaluate the interaction of Fe status with absorption.

Method : Four Fe absorption studies were performed on 60 apparently healthy young women, aged 18-35 years. Based on blood biochemistry 45 of them were Fe deficient (ID) and 15 were Fe replete (IR). The habitual meals assessed were rice, millet & wheat based meals in the ID subjects and rice based meal alone in the IR subjects. Each subject received the test meal labeled with 3 mg of ^{57}Fe (stable isotope) and Fe absorption was measured based on erythrocyte incorporation of isotope label 14 days following administration. The isotopic ratios were measured on negative thermal Ionization mass spectrometry (TIMS).

Results : Mean fractional Fe absorption from the rice, wheat and millet based meals in the IDA subjects were 8.3%, 11.2% and 4.6% respectively. Fe absorption from the rice-based meals was 2.5% in IR subjects.

Conclusion : Fe absorption is dictated by Fe status from low bioavailability diets. Millet based diets have the lowest bioavailability, while the rice and wheat based meals had moderate to good bioavailability. It appears that the current bioavailability of Fe of 8% used in the RDA will hold true for a variety of diets, their inhibitor/enhancer contents, and Fe homeostasis conditions, except in the case of habitual millet based diets. Thus it is prudent to consider ways to improve Fe absorption in millet based meals.