

prior to the time of actual conscription to military service.

Subjects and Methods: In the first part of the study, 457 recruits who came to do their military service in 1993 were examined; 47 of them (10.3%) failed to do their conscript service. Of the 2,402 conscripts who wished to interrupt their compulsory military service and continue conscription as civil alternative service in 1994, 24 also were studied. All 457 recruits and the 24 who went to civil service from their unit, completed the short form of the MMPI depression subscale, which consist 22 items.

Results: The failure rate of the recruits was 10%; the reasons for their failure were psychiatric in 81% and somatic in 19%. Of the 22 items in the MMPI depression subscale, 19 were connected statistically to failure. When a recruit gave six or more risk answers, he had >8 times chance that his service would be interrupted. The depression status of those who applied to civil service resembled that of those whose service was interrupted due medical reasons. The civil servists were even more depressed than were those who failed.

Conclusion: This study emphasizes the importance of adequate classification of fitness for service. The better the classification, the less the rate of failure, the less individual suffering, and the less the waste of training capacity. It is better to both the conscript and the military to exempt unsuitable men from military service.

Keywords: civil service; classification; conscripts; depression; exemption; failure; military service; MMPI; prediction
Prehosp Disast Med 2002;17;s2.

Accidents and Sleepiness in a Military Setting

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Introduction: Human error has been identified as the root cause of the majority of accidents in virtually every industry examined. Agencies that compile accident statistics probably underestimate sleepiness and fatigue as contributors to accidents. There is a lack of scientific awareness in the way sleep and circadian rhythms may control alertness and performance. Work regulations that permit prolonged and dangerous schedules in which sleep is sacrificed for expediency and performance, further exacerbate the safety problem. The consequences of human error due to fatigue potentially are more serious now than before. A number of factors may contribute to sleep deprivation, and accumulated sleep deprivation can have serious consequences for performance. Sleep deprivation is characteristic of schedules that involve prolonged wakefulness, either chronic or intermittent, as well as work that is extended for many days without an opportunity for recovery and sleep. Sleepiness has been documented to impair performance, such as in causing the subject to doze off periodically. The ability to be vigilant visually and react quickly degrades as sleepiness increases. Military settings provide the most important knowledge about sleep and safety. Soldiers are subjected to long work hours, and they handle heavy equipment as well as potentially dangerous material. It has been observed that in peacekeeping operations, soldiers work long hours and are under pressure to perform in situations in which safety regulations may be inadequate and result in serious accidents.

Methods: Sleepiness was measured with the Multiple Sleep Latency Test (MSLT). Sleep latency in sets of <5 minutes constitute an increased propensity to fall asleep unintentionally. The use of MSLT tests during active peacekeeping service almost are non-existent. However, during the last 20 years,

some observations have been made concerning fatigue and accidents in Norwegian soldiers. Annually, about four casualties have been registered of which some were due directly to human error and fatigue resulting from sleep deprivation.

Results: Four incidents will be presented, each analysing relationship between sleep loss and its consequences.

Conclusion: Sleep loss and sleep deprivation during peacekeeping operations resulting in fatigue may jeopardise optimal functioning of military personnel who otherwise are in good health. It is imperative that military planners pay attention to adequate sleep schedules and sleep conditions in order to prevent fatigue. Each soldier must be aware of the hazards of duty if he is not fully alert and awake. Mechanical devices that monitor sleep/wakefulness are available, and they may be of value for signaling to each individual when he is in danger of falling asleep unintentionally.

Keywords: accidents; error, human; fatigue; military; Multiple Sleep Latency Test; peacekeeping; performance; safety; sleep
Prehosp Disast Med 2002;17:s2.

Early Treatment with Hydrocortisone and/or U0126 Inhibits the Synthesis of Reactive Oxygen Species (ROS) after Gunshot Injuries in Pigs

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Introduction: Several external stimuli, including trauma, increase the endogenous production of reactive oxygen species (ROS). These substances spontaneously attack proteins, nucleic acids, lipids, and other important biological molecules. In addition to their direct toxic effects, several pro-inflammatory signalling cascades are induced. The MAP-kinase cascade is a key system in which extracellular signals are transformed into intracellular responses. The purpose of this study was to investigate how the production of ROS is influenced by corticosteroids. The mechanisms for activating granulocytes, especially the importance of extracellular-signal-regulated kinase (ERK), also were investigated.

Material and Methods: The study was done as part of a training course in war surgery organised by the Norwegian Defense Medical Headquarter at Lahaugmoen Camp. Seventeen pigs (45–55 kgs) were used for the experiments. During general anesthesia, the left femoral artery was exposed and catheterized for blood analysis and for monitoring purposes. The animals were brought to the shooting range and exposed to a standardized insult: one gunshot hitting the right femur from a distance of 25m, and one pistol shot to the left upper abdomen from close range. First-aid treatment was instituted, and the animals were transported to a nearby field hospital for surgery. The animals were randomized into two groups. Group I (n = 9) received hydrocortisone 250mg IV, and Group II (n = 8) received a similar IV injection of saline. The injection was given 5 min after the last shot. Blood samples were drawn before the shooting (baseline = 100%), immediately after the hydrocortisone was given, and 60 min after the shooting. Circulating granulocytes were isolated, and the production of ROS was measured by a fluorometric method. Granulocytes from nine randomly chosen animals (5 from Group I and 4 from Group II) were treated in vitro with the ERK inhibitor U0126.

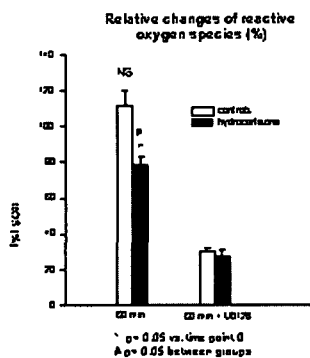
Results: The severity of the injuries after shooting were assessed using the Abbreviated Injury Scale and did not differ significantly between the animals. All survived the first 60 min. The production of ROS significantly was lower in the group that had received hydrocortisone (see figure). Administration of U0126 reduced the synthesis of ROS by about two-thirds in both groups, independently of time.

Conclusion: Early treatment with hydrocortisone after trauma inhibits the synthesis of ROS. The results also suggest that the ERK branch of the MAP-kinase signalling cascade is an important transduction pathway in trauma. The capacity of selective ERK inhibitors to modulate the post-traumatic inflammatory response is promising, but compelling evidence of their usefulness in vivo still is lacking.

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Keywords: glucocorticoids; gunshot; MAPK; reactive O₂ species; trauma

Prehosp Disast Med 2002;17:s3.



Impaired Recognition of Novelty in Rats with Mild Hypothermia Observed in Body or Brain

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Introduction: Optimal cognitive function is dependent on normal body/brain temperature in both humans and animals. Relatively low temperatures have been linked to cognitive deficits in humans (33°C) and in rats (30°C). A link between body and brain temperatures has been reported for the rat. The purpose of the present study was two-fold. First, it was to examine whether the two categories of mild hypothermia (32–34°C and 35–37°C) might result in cognitive impairment in a novelty test previously shown to be sensitive to subtle brain lesions. Second, it was investigated whether recording body temperature and brain temperature might yield parallel results.

Materials and Methods: Male Wistar rats were provided with a transmitter in the peritoneum for monitoring body temperature or a thermistor probe in the frontal cortex for monitoring brain temperature. The rats were cooled in water (14–16°C) for 6–8 min., and then were allowed to dry for 30 min before behavioral testing. Following a pre-training procedure, the rats were twice given a novelty test in which optimal performance requires the detection of a discrete novel object.

Results: It was found that both levels of hypothermia resulted in a decreased ability to detect environmental changes; the deepest hypothermia (32–34°C) produced the most pronounced effects. A very close correspondence was noted between body and brain temperatures and behavioral effects. In

normothermic control animals, the body and brain temperatures virtually were identical in the standardized test situation.

Conclusion: It is evident that a modest decline in body/brain temperature of 1–3°C is sufficient to impair cognitive functions.

Keywords: brain; cognition; hypothermia; temperature
Prehosp Disast Med 2002;17:s 4.

Reproductive Health Characteristics in the Danish Gulf War Study

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Introduction: An increased prevalence of neuropsychological, gastrointestinal, and skin symptoms^{1–7} has been found in Danish Gulf War Veterans (GWV). The hypothesis was tested that the male reproductive system also could have been affected by various exposures.

Methods: A cross-sectional study was performed during the period of 1997 to 1998, involving 661 male subjects deployed in the Gulf between 02 August 1990 and 31 December 1997. A control group of 215 Danish military men was selected with random matching by age and type of work. All participants were interviewed based on a previously completed comprehensive questionnaire, and underwent clinical and para-clinical examinations. A venous blood sample was drawn to determine serum concentrations of the follicle-stimulating hormone, the luteinizing hormone, testosterone, serum hormone binding globulin, and inhibin B.

Results: No differences were found between GWV and controls with respect to any of the reproductive hormones, nor with respect to fertility or the prevalence of spontaneous abortions, congenital diseases, or malformations among the offspring. Also, cohabitational characteristics were similar. These results are in agreement with later unpublished data from an explorative, tentative study looking at specific diagnoses in children of GWV and in those of controls. Only self-assessed sexual problems were more prevalent among GWV, 12%, as compared with 3.7% among controls, $p < 0.001$. A statistically significant association was found for self-reported sexual problems and psychological exposures related to specific traumatic events during deployment.

Conclusion: The biological reproductive health of male GWV seemed to be unaffected by their engagement in the post-war peacekeeping mission.⁸

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Keywords: health, reproductive; Gulf War; peacekeeping; resources

Prehosp Disast Med 2002;17:s4.

Exercise-Induced Bronchial Obstruction and Weather

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