

Keywords: effects, health; exposure; health; Kosovo; peace-keeping; uranium

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Body Heat Balance During Interval Exercise in a Cold Environment

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Introduction: The effect of simultaneous changes in exercise and ambient temperature on body heat balance and physiological strain was studied.

Methods: The exercise/rest periods were either 10/10 minutes or 30/30 minutes, and the total duration of the protocol was 120 min. Exercise (walking 6 km/h on a treadmill with a slope of 2°) was performed in a cold environment (-15°C, air velocity 2.5 m/s). The resting periods were spent sitting at +10°C, air velocity 0.2 m/s, wearing the same clothing worn during exercise. The subjects were seven voluntary, healthy young men. They were wearing Finnish military winter clothing (M91, thermal insulation about 2 clo) and a rucksack (12 kg). The subjects were allowed to drink water freely during the rest periods.

Results: Data are given as mean \pm SE. The mean skin temperature was 31.7 \pm 0.2°C during the 10/10 schedule and 31.3 \pm 0.3°C during the 30/30 schedule. The deep body temperature was 37.5°C on average during both schedules. At the end of the last exercise period, oxygen consumption was 33.5 \pm 0.9 ml/min/kg in the 10/10 schedule and 32.4 \pm 3.8 ml/min/kg in the 30/30 schedule. During the exercise periods, heart rate was 150 beats/min on average for both schedules. The amount of perspiration was similar during the 10/10 schedule (809 \pm 118 g) and the 30/30 schedule (777 \pm 81 g). The fluid intake was greater ($p = 0.01$) during the 10/10 schedule (457 \pm 121 g) than during the 30/30 schedule (141 \pm 41 g). The accumulation of perspiration in the subjects' clothing was greater ($p = 0.02$) during the 30/30 schedule (392 \pm 32 g) than during the 10/10 schedule (353 \pm 28 g).

Conclusion: The body heat balance and physiological strain were similar comparable in both exercise/rest schedules. The fluid intake was greater during the 10/10 minutes exercise/rest schedule, while the amount of perspiration was similar for the two schedules. The accumulation of perspiration in the subjects' clothing was greater during the 30/30 schedule. The longer continuous period in a cold environment (30 min.) could have led the perspiration to condense inside the clothing, thus reducing the capacity for evaporation. These findings suggest that specific instructions for clothing type and fluid intake are needed for different combinations of exercise and rest in changing ambient temperatures.

Keywords: clothing; cold; evaporation; exercise; fluid; heat; perspiration; rest; temperature

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Military Fitness Class of Finnish 18-Year-Old Men: Prediction of Military Fitness Class at Call-Up

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Introduction: Military service lasting from 6 to 12 months is obligatory for Finnish men. They undergo a medical examination during the spring of the year they turn 18 years of age. The purpose of the examination is to obtain a preliminary assessment of their fitness class for military service. A call-up board confirms the fitness class the following autumn. The percentage of releases ranged between 7.5% and 10.8% in 1990–1998. During the same period, 6.0–8.6% of those who were regarded as capable of beginning their military service were discharged during the period of service due to health problems, mostly related to their mental health. The aim of this study was to develop methods for more accurate screening at the time of call-up.

Materials and Methods: The basic population of the study is the about 32,000 Finnish men who were born in 1981 and thus, had their obligatory call-up in 1999. At the time of their call-up, they completed two questionnaires: 1) the Conscript Screen; and 2) the P2-test that was developed for the use by the Finnish Military Forces. The Conscript Screen is a 25-item questionnaire developed by one of the authors (KP). The P2-test includes scales assessing the leadership capabilities of the conscript, and includes the following scales of the Minnesota Multiphasic Personality Inventory (MMPI): 1) lie; 2) infrequency; 3) correction; 4) hypochondriasis; 5) psychopathic deviate; 6) psychasthenia; and 7) schizophrenia.

Results: Preliminary results suggest a strong statistical correlation ($p < 0.0001$) between the risk of being released from military service at the call-up either temporarily or permanently using the Conscript Screen and most of the scales of the P2-test.

Conclusions: There should be some test to evaluate the suitability of conscripts for military service at call-up. The two tests described are valuable tools at conscription.

References

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Keywords: Conscript Screen; conscripts; fitness; mental health; military; Minnesota Multiphasic Personality Inventory (MMPI); screening

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Displaced Stress Fractures of the Femoral Shaft

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Introduction: Military trainees often are affected by displaced stress fractures of lower extremities. The displacement of a long bone fatigue fracture is a rare but serious injury. The most common sites of stress fractures are the tibia, metatarsal bones, and the calcaneus. The incidence of fatigue fractures reported among military conscripts during the training period ranges from 3–4% up to 64%, depending on the exact nature of the training. The proportion of femoral shaft stress fractures out of all stress fractures studied ranges from 3–5% up to 25–43% in military conscripts, and from 3–7% up to 14–21% in athletes. The purpose of this study was to scrutinize the incidence, the etiologic factors, and the morphologic characteristics of displaced femoral shaft fatigue fractures over a 20-year period, in order to evaluate the chances of preventing prolonged morbidity caused by these injuries in healthy conscripts during their basic military training.

Patients and Methods: All displaced femoral shaft fatigue fractures treated at the Central Military Hospital during a 20-year period from 01 January 1980 through 31 December 1999 were analyzed. The original, complete medical records, including radiographs of each patient, were retrieved and reviewed. The conscripts concerned were invited to the outpatient department for a physical and radiographic examination. The median follow-up time was seven years (range: 2–16 years). The previous health condition including medication, cigarette smoking, sports participation, possible injuries, and operations, was recorded. The body mass index at the time of the fracture onset was measured. The military training level, prior pain, or other symptoms of the lower extremity after the beginning of the service, the activity during the fracture onset, the fatigue fracture morphology, and the fracture treatment also were recorded.

Results: Ten previously healthy male conscripts sustained displaced femoral shaft fatigue fractures, with an incidence of 1.5 per 100,000 person-years in military service. The median age of the patients was 19 years (range: 18–20 years). None had any prior fatigue fractures. The median body mass index was normal (21.5 kg/m², range: 18.3–32.2 kg/m²). Before the fracture displacement, nine conscripts had suffered from thigh or knee pain for 1–6 weeks. Six of ten fractures were located in the distal third of the diaphysis, and the most common fracture pattern was a noncomminuted, oblique or oblique-transverse configuration. Only one fracture occurred in the proximal third. Five fractures were treated using an intramedullary nail, four fractures with a dynamic compression plate, and one with a dynamic condylar screw-plate. The bone at the fractures proved to be brittle, and six fractures suffered from additional comminution intraoperatively. Two reoperations were necessary to exchange a nail and a screw. The median time to solid bony union was 3.5 months (range: 3–5 months). The conscripts returned to alleviated military service six weeks postoperatively on average. Two were exempted from the military service for two years.

Conclusions: Displacement is a rare, highly undesirable consequence of stress fracture of the femoral shaft among young conscripts during their basic military training. Preventive methods should focus on the early, effective detection of developing fatigue fractures to avoid fracture displacement, with subsequent prolonged morbidity and possible complications. Gentle handling of the bone during the fracture fixation procedure is imperative because of the extraordinary brittleness of the fracture fragments.

Keywords: conscripts; fractures fatigue; fractures femur; military; prodrome; stress; trainees; training
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A Follow-Up Survey of NATO Peacekeeping Personnel in Kosovo: TMBN/KFOR I 1999–2000: "How are you now, 6 months after service?"

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Introduction: Public attention has been directed to mental health problems among Norwegian soldiers after serving in international peacekeeping operations. The UNIFIL study, conducted 3–10 years after service, documented that 5% of the Norwegian soldiers who completed their tour, and 15% of personnel who did not, reported mental problems after serving in the peacekeeping mission in Lebanon (Aarhaug et al, 1993; Mehlum, 1995; Weisæth et al, 1996). The main tasks of the

Norwegian Armed Forces' Stress Management Team for International Operations (SMT) are to prepare personnel for international operations, and to provide support and advice during deployment. The SMT also works to identify personnel with service-related, mental health problems, and provides follow-up services if necessary. In October and November 2000, six months after redeployment from Kosovo, all personnel from Telemark Battalion (TMBN)/KFOR I were invited to a veteran reunion arranged by the Telemark Regiment. In order to obtain a broader understanding of the personnel's view of the mission, and to identify personnel who might need follow-up due to mental health-related problems as a consequence of their service, an anonymous survey was conducted for former members of TMBN/KFOR 1 by SMT.

Methods: A questionnaire was developed by SMT and administered to all of the veterans who attended the reunion, and was mailed to personnel who did not attend. The results reported are based on the questionnaire.

The questionnaire included questions concerning whether the individual has experienced any problems related to mental health, physical condition, sleep, or with family/friends, as a consequence of the service. The questionnaire also was used to survey the existing friendships and networks within the group in order to find out if former personnel still were in touch with each other, and if they would provide comrade-support if needed. Benefits from service (self-confidence, personal development), comradeship, and evaluation of military leadership during the mission were measured. In addition, assessment of the reunion by those who participated also was assessed.

Results: The participants included 632 soldiers or officers, which represents 53% of the total possible population. Less than 2% reported mental health problems connected to the service. Of the participants, 80–85% reported personal benefits from their tour of duty, had experienced a positive outcome related to the experiences while in the service, and would recommend to a good friend that they should serve abroad with Telemark Battalion. In addition, 85% of the respondents showed great interest in the reunion organized by their Regiment.

Conclusion: When surveyed six months after redeployment, 98% of the respondents did not report any negative health effects due to serving with the TMBN in Kosovo. An officially organized reunion for all personnel after redeployment seems to be an adequate way to bring to a close the service, maintain comradeship, and express an appreciation for the personnel's efforts. Reunions provide a good opportunity to survey and initiate follow-up services without stigmatizing personnel.

Keywords: effects; health; follow up; NATO peacekeeping in Kosovo; reunion; survey; veteran
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Antioxidant Status of Soldiers Associated with Smoking and Morbidity during Military Service

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Aim: to investigate antioxidant status of servicemen at the beginning and at the end of the service in relation to their smoking habits and morbidity during their time in service.

Object and Methods: A total 177 recruits, aged 20.7 ± 1.3 years (mean ± SD) from Panevezys region MIB were interviewed for smoking habits and for their morbidity (mainly for the frequency of cold troubles per service year). Concentration of lipid peroxidation marker malondialdehyde (MDA) and