

AMMA JOURNAL VOL 12 ISSUE 1

MARCH 2003

Abstract from the Literature

by
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Neri DF, et al. Controlled breaks as a fatigue countermeasure on the flight deck. Aviat Space Environ Med 2002; 73(7): 654-664.

BACKGROUND

A MAJOR CHALLENGE FOR FLIGHT CREWS is the need to maintain vigilance during long, highly automated nighttime flights. No system currently exists to assist in managing alertness, and countermeasure options are limited. Surveys reveal many pilots use breaks as an in-flight countermeasure, but there have been in controlled studies of their effectiveness.

HYPOTHESIS

We hypothesised that brief regular breaks could improve alertness and performance during an overnight flight.

METHODS

A 6-hour uneventful night time flight in a Boeing 747-400 flight simulator was flown by 14 2-man crews. The 14 subjects in the treatment group received 5 short breaks spaced hourly during the cruise; the 14 subjects in the control group received 1 break in the middle of the cruise. Continuous EEG/EOG, subjective sleepiness, and psychomotor vigilance performance data were collected.

RESULTS

During the latter part of the night, the treatment group showed significant reductions for 15 min post-break-in slow eye movements, theta-band activity and unintended sleep episodes compared with the control group. The treatment group reported significantly greater subjective alertness for up to 25 min post-break with the strongest effects near the time of the circadian trough. There was no evidence of objective vigilance improvement at 15-25 min, with expected performance deterioration occurring due to elected sleep drive and circadian time.

CONCLUSIONS

The physiological and subjective data indicate the breaks reduced nighttime sleepiness for at least 15 min post-break and may have masked sleepiness for up to 25 min suggesting the potential usefulness of short duration breaks as an inflight fatigue countermeasure.

COMMENT

An impressively comprehensive study 6 hours, however, is not the real test; the next generation commercial air craft will have 20 hours duration. There should be locations for the crew to lie down and get good rest. This contrasts with current aircraft where, in most cases, the crew has to catch their nap in first class. Singapore Airlines was recently castigated for trying to send their resting crew to economy class to maximise returns. I know where I would rather have my pilot taking his needed rest.

Aikins SA, Reynolds Aj. Long-distance air evacuation of blast injured soldiers from the USS Cole. Aviat Space Environ Med 2002; 73(7): 677-683

BACKGROUND

The US military uses a Critical Care Air transport Team (CCATT) to air evacuate critically ill patients to facilities that can provide definitive medical care. CCATT is comprised of highly trained personnel and each team uses specialised equipment to allow for in-flight intensive medical care of patients. CCATT has the capability of providing care over long duration and distance. This report describes our recent experience of long-distance fixed-wing medical air evacuation of multiple critically ill sailors from the USS Cole.

CONCLUSION

CCATTs can safely transport multiple critical patients with blast injuries over long distance and duration by fixed-wing aircraft. Blast injuries can have multi-system effects and patients with subclinical pulmonary injury may be symptomatic when hypoxaemic in a hypobaric environment.

COMMENT

I am a little intrigued as to why the authors talk about duration and distance. Surely the parameter is time and time alone. It is irrelevant how far you are going in that time... Still a useful update on the USAF experience with CCATTs, which arose from the doctrine shift of moving only stable patients to stabilised patients. It is also useful to compare this operation with Op Bali Assist.

Mixeu MS, et al. Impact of Influenza vaccination on civilian aircrew illness and absenteeism. Aviat Space Environ Med 2002; 73(9): 876-880.

BACKGROUND

Approximately 10% of the general population world wide acquires influenza infection every year. Airline crews run a particularly high risk of contracting influenza and influenza-like viruses because they come into contact with hundreds of potentially infected individuals every day. Respiratory diseases are the most frequent cause of absenteeism among flight crews in air line companies. Several studies have shown the efficacy of influenza vaccination in the workplace of healthy, working adults leading to increased productivity and lower absenteeism. We conducted a double-blind, randomised placebo-controlled study on flight crews of an airline company in order to determine the safety and efficacy of a trivalent inactivated influenza vaccine in reducing illness and absences from work.

METHODS

The 813 healthy members of a Brazilian airline company were randomly assigned to receive injections of either an influenza vaccine or a placebo, with a follow-up period of 7 months after vaccination. Primary outcomes included influenza-like illness episodes and absenteeism from work due to such episodes.

RESULTS

Demographic characteristics were similar in the two groups. No significant side effects occurred in either group. Compared to the placebo group, individuals receiving the vaccine showed 39.5% fewer episodes of flu-like illness ($p < 0.001$) and 26% fewer days of work lost ($p = 0.03$). The vaccinated group developed 33% fewer episodes of any severe flu-like illness ($p < 0.01$).

Conclusion: The data indicates that influenza vaccination is safe in airline flight crews and may produce health-related benefits including reduced absenteeism.

COMMENT

After the reprinting of my article from 1992 in the last AMM, I had to include this. It is very true that frequent travellers will be more exposed to a variety of infective agents. Part of the issue is, however, travel out of influenza 'season' of their home country and how this should be covered, and exposure to different strains to the ones anticipated and thus included in the typical trivalent vaccine.

Cairns, Booth C. Salivary IgA as a marker of stress during strenuous physical activity. Aviat Space Environ Med 2002; 73(12): 1203-1207.

BACKGROUND

Immunoglobulin A in saliva (SigA) has been proven to be decreased during periods of stress, a change that also correlates with increased disease risk. Hypothesis: Concentration of SigA is negatively associated with dietary deprivation, negative moods and anxiety.

METHODS

SigA was evaluated as a marker of severe stress during a 19-day Royal Australian Air Force (RAAF) survival course, during which students experienced hunger, thirst, boredom, loneliness, and extreme heat and cold combined with demanding physical effort. There were 27 men and 2 women who participated. Students kept daily food diaries, from which daily intakes of energy and macronutrients were calculated. Saliva samples were collected on day 9 for the measurement of the ratio of SigA to albumin. Students completed a health checklist and the State Anxiety Inventory on the same day 9 and the Profile of Mood States on 3 of the days.

RESULTS

Dietary restriction, consumption of alcohol, body mass loss, the occurrence of upper respiratory tract infection and negative emotions were negatively associated with SigA: Alb

Conclusions: SigA: Alb is a useful marker of the severity of stresses encountered during stressful training.

COMMENT

This is a study that came out of the Defence Nutrition Research Centre in Scottsdale, Tasmania, sponsored by Defence Health Service Branch. As a marker of stress and of risk of illness or reduced performance, there appears to be a considerable opportunity. Of course, there are many unanswered questions, such as predictive value, ease of measurement and what to actually do about a low result.

Pflanz S, Sonnek S. Work Stress in the Military: Prevalence, Causes, and Relationship to Emotional Health. Mil Med 2002; 167(11).

OBJECTIVE

This study examined the prevalence and sources of occupational stress for military personnel and the relationship between work stress and emotional health in the military population.

METHODS

Four hundred and seventy-two active duty military personnel stationed at F. E. Warren Air Force Base completed a 65-item survey that included items involving reported life events, perceptions about occupational stress, and perceptions about the relationship between work stress and emotional health.

RESULTS

These military personnel were significantly more likely to report suffering from job stress than civilian workers ($p < 0.001$). One-quarter (26%) reported suffering from significant work stress, 15% reported that work stress was causing them significant emotional distress, and 8% reported experiencing work stress that was severe enough to be damaging their emotional health. Generic work stressors were endorsed more frequently than military-specific stressors.

CONCLUSIONS

More than one-quarter of this sample of military personnel reported suffering from significant work stress and a significant number of these individuals suffered serious emotional distress. These results support previous research suggesting that work stress may be a significant occupational health hazard in the U.S. military.

COMMENT

I find it a little difficult to fathom why work stress should be so much greater in the US military than in the civilian population. The admittedly unrigorous surveys done in the ADF have not revealed anything like the same patterns in this country.

McCrary P. When to retire after a concussion? J Sci Med Sport 2002; 5(3): 169-182

The management of an athlete with recurrent concussions, whether persistently symptomatic or not, remains anecdotal. There are no evidence-based guidelines upon which a team physician can advise the athlete. All doctors involved in athlete care need to be aware of the potential; for medicolegal problems, if athletes are inappropriately returned to sport prematurely or in the case of professional athletes held out of the sport or retired on the basis of non-scientific recommendations.

COMMENT

McCrary is a neurologist in Melbourne and is the name in concussion in the world. Concussion is a vastly misunderstood phenomenon and has many myths around it. This article would benefit any military doctor who sees more than a fair share of sporting injuries.

McCrary B, Van Syoc D. Permanent flying disqualifications of USAF Pilots and navigators (1995-1999). Aviat Space Environ Med 2002; 73(11); 1117-1121.

BACKGROUND

The USAF devotes great financial and medical assets to the identification and evaluation of USAF aircrew who have been grounded from flying duties for medical conditions thought to be dangerous to the flying mission or personal safety. The purpose of his study is to update the literature and to demonstrate that USAF efforts during the past 19 years have improved our ability to retain experienced aviators.

METHODS

The USAF waiver file was reviewed to quantify the number of USAF pilots and navigators receiving permanent medical disqualifications from flying duties during 1995-1999. We identified 157 cases, which were stratified by age group and sex.

RESULTS

The number of disqualifications increased incrementally by age group. The most common diagnoses resulting in permanent disqualification were coronary artery disease, hypertension, back pain and disk abnormalities, migraine headaches, diabetes mellitus and substance/alcohol abuse.

DISCUSSION

These results are very similar to those reported in a 1984 USAF study and other studies of aviation populations. The rate of permanent flying disqualifications in this study was equal to 0.18% per year compared to 4.1% per year in 1984. This decrease in the rate of disqualifications could be due to modification of USAF standards, utilisation of clinical management groups, new technology or therapies, better screening of applicants and effective preventive medicine efforts through out the Air Force.

COMMENT

4.1% per year permanent disqualification? That would amount to pretty much EVERY pilot being medically grounded by the end of a 20-year career. That is palpable nonsense, and this study returns figures to a realistic level. It must call into question the earlier study methods. The USAF has a very comprehensive system where any aircrew member who requires medical evaluation is assessed by a specialist panel at the specialist consultation service at Brooks Air Force Base.

Buckingham R, et al. Vision readiness in Operation Restore Hope. Mil Med 2002; 167(7): 532-536.

Ensuring that our forces are vision ready for their mission is essential on today's battlefield. Vision readiness considers optical readiness (appropriate correcting eye wear) and visual readiness (adequate job-required visual acuity). A study of vision readiness among deploying personnel for Operation Restore Hope in Bosnia from December 1995 to September 1997 was conducted at Fort Benning, Georgia. Of the 10063 personnel screened, 3554 (35.3%) were not optically ready for deployment and 406 (4.0%) were not visually ready for deployment. Analyses indicated a statistically significant difference between the active duty and reserve components in optical and visual readiness. A more effective vision readiness process should be implemented before deployment to ensure that all personnel are deployment ready. Optometry personnel, commanders and deploying soldiers, sailors, airmen and marines must take a more active role in ensuring that our forces have the appropriate visual acuity and optical devices to deploy.

COMMENT

I haven't seen a similar study to before this. Over 10000 subjects is an impressive number. It doesn't matter what the standards are that are being screened for, the point is the percentage that do not meet whatever the standard is. Certainly, enough to have us wondering in Australia about how ready our personnel are.