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Poster Presentation Abstracts

P-01

AEROMEDICAL EXAMINATION OF AIR CREWS: RETROSPECTIVE ANALYSIS OF A THREE-YEAR PERIOD ACCUMULATING ANNUAL RECORDS 2013-2015 IN SOUTH KOREA

EXAMEN AÉRO-MÉDICAL D'ÉQUIPES AÉRIENNES: ANALYSE RÉTROSPECTIVE D'UN RECORD DE 3 ANS CUMUL ANNUEL DE 2013-2015 EN CORÉE DU SUD

J Jang, W Hyun, Y Kwon

Chung-Ang University , Seoul, South Korea

alsaba@cau.ac.kr

Introduction: This study results present the reasons of medical disqualification among the air crew population in Korea. The aeromedical decision was made under ICAO standards whether crew is medically fit for flying.

Methods: Files for successive 3-year period on all disqualified pilots were reviewed and analyzed the data subdivided into diagnostic categories and other parameters.

Results: Among a total of 28286 cases, 4236 were determined as conditioned fit to fly (15%) and 91(0.3%) cases of final disqualifications forcing grounding were noted. The number of initial disqualifications paralleled in increasing seniority (late 40s or older) and flying experience (total flight time of 10,000 hours or more). Eye correction surgery (18.3%) is the commonest reason for initial disqualification. Hypertension (17.6%), hearing loss (9.5%), diabetes (6.8%), heart disease with cardiac stent and cancer surgery followed in order of frequency. In unfit cases, coronary artery disease is the most common one.

Conclusion: Hypertension and cardiovascular disease are the most common causes of the initial disqualification in practice requiring more attention in physical examination in air crew.

P-02

THE IMPORTANCE OF AVAILABILITY OF COMPLETE MEDICAL DOCUMENTATION OF CANDIDATES FOR CLASS 1 AND CLASS 2 MEDICAL EXAMINATIONS

L'IMPORTANCE DE LA DISPONIBILITÉ D'UNE DOCUMENTATION MÉDICALE COMPLÈTE DES CANDIDATS POUR LES EXAMENS MÉDICAUX DES CLASSES 1 ET 2

H Cutuk, M Mulaomerovic, M Manduric, A Šahat

Institute for Health Care of Traffic Workers, Sarajevo, Federation of Bosnia and Herzegovina

cutukhalima@hotmail.com

Introduction: Research on airplane accidents has shown a direct correlation between psycho-physical status of the pilot and flight safety. Almost 80% of aviation accidents are caused by human error associated with poor health, fatigue and aging-related changes. The strict health requirements for pilot candidates are well defined, but occasional omissions do happen. What can AME do to improve this situation?

Background: The Institute for Health Care of Traffic Workers Sarajevo is a specialized healthcare institution that provides services in the field of primary and specific healthcare for workers, as well as specialized consultative healthcare primarily for workers in the field of traffic and communication. The Institute is a BHDCA (Bosnia and Herzegovina Directorate of Civil Aviation) authorized health institution for issuing medical certificates for aviation, and the only authorized AMC in B&H with 4 authorized AME doctors. Certificates are issued in accordance with EASA compliant rules.

Medical records of candidates are kept with selected family practitioners and AME does not have access to them because of the Protection of Patient's Rights law and Medical Data Protection. The records contain information on health status of the candidates. Sometimes candidates are not completely honest in reporting their medical issues, hiding some conditions that are impossible to detect if they are medicated.

Summary: How to prevent this situation from happening and avoid tragic consequences that have already happened in the past?

- Legislation should be changed in order to allow AME to access the candidates' medical records, or to have their records in the AMC.
- The candidates should be thoroughly informed about their obligation to report any change in psycho-physical state to their AME.

These measures can ensure that only pilots deemed fit are allowed to man aircraft, and the result will be reduction of the number of accidents caused by health issues.

P-03

LICENSING OF A PILOT WITH ASTIGMATISM

LICENCE D'UN PILOTE AVEC L'ASTIGMATISME

TF Kozelj, F Salamun

AeMC, Ministry of Defence, Ljubljana, Slovenia, Slovenia

kozelj.tomaz@gmail.com

Introduction: A case report of a pilot who was rejected for Class 1 by AeMC because of astigmatism is presented.

Case Report: During a Class 1 medical examination, a candidate was found to have corneal astigmatism greater than 2 diopters of cylinder. Because of EASA rules [AMC1 MED.B.070 (d) (1) (iii)], which state that astigmatism shall not exceed 2.0 diopters for applicants, the pilot was rejected for Class I by AeMC. We found that internal astigmatism was opposite to the corneal astigmatism, and on subjective refraction the pilot had only 0.75 diopters of cylinder. The candidate was certified for Class 1.

Discussion: Internal astigmatism is lens astigmatism. In our case, it was in the opposite direction to the corneal astigmatism, accounting for the lower spectacle cylinder (subjective astigmatism). One should judge the magnitude of the astigmatism based on spectacle refraction.

P-04

PROFESSIONAL PILOT BECOMES UNFIT TO FLY ON AIRPLANE – BURNOUT? (CASE REPORT)

*UN PILOTE PROFESSIONNEL DEVIENT INADAPTÉ À VOLER EN AVION - UN BRÛLAGE?
(RAPPORT DE CAS)*

L Ungváry

*HA-AME, Budapest, Budapest, Hungary
ungvary.lilla@gmail.com*

Background: Specialists in aeromedical activity examine and evaluate the fitness for work of professional and non-professional pilots. This case report presents the work-related musculoskeletal disease of a pilot which could have been the result of chronic stress, disturbed biorhythms and loss of motivation (burnout) and which ended in leaving the profession.

Case Report: A young female commercial pilot presented herself for an out of turn examination. According to her occupational history she began her aviation career 10 years ago and has now logged over 1200 hours in commercial jet aircraft. She reported domestic and occupational stress, as well as disappointment in starting a family. Two years ago, she was placed on sick leave due to cervical radicular pain, which improved slightly with physiotherapy. The prolonged time away from flying duty resulted in an exposure to a different lifestyle and situation.

Discussion: This pilot's symptoms did not improve significantly with several months of treatment and rest. Although workplace cervical spine problems are seemingly not of the same origin, the relationship between musculoskeletal disorders, stress, and psychosocial factors is increasingly being recognized. Psychosocial factors include workplace environment, environment outside the workplace as well as the worker's personality. Interactions may develop between these that can negatively affect the worker's health or performance. Psychosocial factors have been reported to cause musculoskeletal disorders, pains which are the direct or indirect effect of stress.

Conclusion: Professional pilots study for many years, spend a lot of money on their training since they are very motivated to reach their goal. But what happens when they reach their goal and can fly the biggest planes but also encounter the downsides of the profession: lots of overnights, little rest, responsibility, exhaustion, difficulty of keeping up with social, human relationships because of unfavourable schedules? What happens if motivation is lost? And what happens if it is the body that indicates this first? The likelihood of developing burnout arose in connection with this case.

P-05

USE OF ILLICIT DRUGS AND PILOTING SAFETY

UTILISATION DE DROGUES ILLICITES ET SÉCURITÉ DU PILOTAGE

M Bilban

Institute of Occupational Safety, Ljubljana, Ljubljana, Slovenia

marjan.bilban@zvd.si

Introduction: Data on causal relationships between psychoactive substance abuse and accidents or incidents are lacking and hard to interpret. National guidelines regarding random testing for alcohol or drugs differ from one European country to another. In some countries, testing is carried out by the police, in others there is no testing at all. In many countries, regulations on testing are determined by the employer. Legislation regarding random testing may also conflict with privacy laws and legislation on employment relationships. Slovenia uses EU Directive 2018/1139 and the Implementing Rule: AMC 2 MED.B.055 Mental health.

Methods: Screening tests for various drugs include the AllTest quick drug test that involves a qualitative analysis of the presence of illicit substances and their metabolites in urine based on the fast immunochromatographic method and screens for illegal drugs, as well as other drugs if prompted by risk assessment. Psychological examinations in form of guided interviews, mental capacity tests, personality questionnaires, etc., are carried out as well. If a screening test is positive, a confirmation test is carried out (in accordance with national standards – immunochemical or chromatographic tests). If the confirmation test is positive as well, the patient in question must also be examined by a psychiatrist specializing in addictology.

Results: Drug testing has been part of initial physical examinations for 10 years. Among approximately 500 tests, 2 were positive (for THC). Among random periodic tests, a further 2 were positive (1 for THC and 1 for cocaine). As everybody involved accepted the results, the tests were not repeated at the National Institute of Forensic Medicine; further steps were taken in accordance with the law.

Conclusion: We consider drug testing for pilots and other air crew to significantly contribute to greater safety of flying and to the awareness of the population in question. We conclude alcohol or illicit drug abuse is a very rare cause or risk factor in accidents in air travel caused by 1st class pilots.

P-06

AN UPDATED APPROACH TO CARDIOVASCULAR RISK ASSESSMENT IN PILOTS

UNE APPROCHE MISE À JOUR POUR ÉVALUER LE RISQUE CARDIOVASCULAIRE CHEZ LES PILOTES

A Mulloy, A Wielgosz

University of Ottawa Heart Institute, Ottawa, Ontario, Canada

amulloy@ottawaheart.ca

Background: For over 30 years the global medical community has attempted to identify an acceptable level of cardiovascular risk with respect to pilot certification. Applying general population statistics to this population presents many challenges, which are compounded by the ever-changing technological landscape of air travel. We aimed to review the existing literature on estimating the risk of pilot cardiovascular incapacitation and determine if the current international guidelines are founded in the best-available evidence.

Methods: A detailed review of the existing guidelines and the literature that supports them was completed. Relevant articles were identified by reviewing guidelines and identifying the source literature and by reviewing the references of these source documents. All articles referenced in the narrative review were reviewed in full by both authors. Data that informed the existing recommendations were reviewed and compared to available modern data. The results of these findings were then incorporated into a formula that allows for the calculation of acceptable pilot cardiovascular risk given any operator-determined set of variables.

Results: A number of assumptions have been made in creating international guidelines that have not been updated to reflect the current technological or medical aviation environment. Incorporating the identified variables into a novel formula allowed for the calculation of an acceptable cardiovascular risk threshold when populated with existing data. This formula, modelled on the Canadian Cardiovascular Society Risk of Harm formula was tested using past data and reproduced existing results.

Discussion: Current international guidelines for pilot cardiovascular risk assessment require review and consensus by the international aviation medical community. We propose a novel formula that may serve as a template for future guidelines and may be adapted as aviation technology and health data evolve.

P-08

RETURN TO FLYING AFTER CORONARY ARTERY BYPASS GRAFT (CABG) IN COMPARISON TO PERCUTANEOUS TRANSLUMINAL CORONARY ANGIOPLASTY (PTCA) IN AIRLINES PILOTS IN IRAN.

REPRENDRE LE VOL APRÈS UNE GREFFE DE PONTAGE D'ARTÈRE CORONAIRE (PAC) EN COMPARAISON À L'ANGIOPLASTIE CORONAIRE TRANSLUMINALE PERCUTANÉE (PTCA) CHEZ LES PILOTES DE LIGNE AÉRIENNE IRANIENS

K Soleimani, M T Shooshtari

Civil Aviation Organization, Tehran, Iran

kordoraj@gmail.com

Introduction: Cardiovascular events causing incapacitation in flight crew are very rare. Flight crew are responsible for safe and reliable aircraft operations. Pilots who have coronary artery disease may have coronary artery bypass graft (CABG) or percutaneous transluminal coronary angioplasty (PTCA) inserted to treat their IHD, and may wish to return to flying. The purpose of this study was to investigate return to flying after CABG in comparison to PTCA in airline pilots in Iran.

Methods: The outcome of all pilot medical examinations in Iran are gathered in the archive of the Aeromedical Section of the Iranian Civil Aviation Authority. The study was carried out retrospectively and reviewed the cardiac evaluation of 65 flight crew patients with CHD, confirmed by angiography at hospital heart center, from Jan 2004 to Jan 2018.

Results: All aircrew in the present study were male. 25 (38.5%) pilots treated with PTCA and 40 (61.5%) pilots treated with CABG and all were restricted from flying for at least six to nine months. Of 25 pilots treated with PTCA, 18 (72%) were allowed to fly; of 40 pilots, 31 (77.5%) pilot treated with CABG were allowed to fly. The return to flying rate was not different after PTCA or CABG. Of the PTCA pilots 72%, and of the CABG pilots 77.5%, resumed flying.

Discussion and Conclusion: Return to flying as a pilot after CABG or PTCA is possible, however, special attention to perioperative planning is mandatory. License endorsement restriction are probable to apply and the postoperative follow-up requires tight scheduling. A cardiologist should always liaise and communicate with an aviation medicine examiner prior to and following cardiac surgery.

P-09

DEMAND FOR SOCIAL STIMULATION VERSUS SELF-ESTEEM WITHIN THE STUDENTS OF THE AVIATION UNIVERSITY

DEMANDE DE STIMULATION ET D'AUTO-ÉVALUATION COMMUNAUTAIRES DES ÉTUDIANTS DE L'UNIVERSITÉ

ZS Kobos, R Wójcik, Z Wochynski

1 Military Aviation and Medical Commission, Warsaw, Poland

zkobos@wiml.waw.pl

Introduction: Risk being an inherent feature of aviation professions provides specific emotional experiences and shapes the demand for social stimulation. Zuckerman's concept shows that each person has an individual need for social stimulation and thus strives for optimal stimulation for themselves. The situation of exceeding individual optima for a given person, through underloading or overloading with excessive stimulation, can affect self-esteem and thus the effectiveness of the execution of aviation missions. Many researchers point to the relationship between high self-esteem and the tendency to take risks - that includes piloting of aircraft. The aim of the study was to verify whether there is a relationship between the search for sensations and self-esteem in a stressful situation, which is an exam in physical education, which determines the qualification for studies at the aviation academy.

Methods: Forty candidates applying for studies at the aviation faculty were qualified for the study. Test methods: Rosenberg Self Esteem Scale, Zuckerman Sensation Seeking Scale V,

Results: The statistical analysis indicated that a) there is a statistically significant relationship between self-esteem and the scale of thrill and adventure seeking ($p < 0.05$, $r = 0.437$), which means that the greater the love for taking risky activities, the higher the self-esteem, and b) there is a statistically significant relationship between self-esteem and experience seeking ($p < 0.05$, $r = 0.393$), which means that self-esteem increases with an increase in the willingness to experience different experiences.

Conclusions: Individuals with high levels of horror and adventures have a greater tendency to choose risky behaviors and tend to increase their self-esteem.

P-10

THE ROLE OF PERSONALITY TRAITS AND COPING STRATEGIES WITH OCCUPATIONAL STRESS AMONG FLIGHT ATTENDANTS IN ONE AIRLINE IN IRAN

LE RÔLE DES CARACTÈRES DE PERSONNALITÉ ET DES STRATÉGIES D'APPROVISIONNEMENT À CONTRAINTE AU TRAVAIL ENTRE LES AGENTS DE BORD D'UNE LIGNE AÉRIENNE EN IRAN

M T Shooshtari, K Soleimani

Payame Noor University, Tehran, Iran

daymahrokhi@gmail.com

Introduction: Airline cabin crew are in many ways a unique occupational group in terms of their irregular work patterns, unique set of job demands and lifestyle. Conflict or tension may exist with passengers, or other crew members. Because of the high visibility of flight attendants to other passengers, and public expectations of FA roles, flight attendants have to deflect anger, meet sometimes unreasonable demands, calm noisy passengers, and still maintain a bright, cheerful, calm exterior. The main objective of this study is to investigate the relationship between personality traits and coping strategies with occupational stress among airlines flight attendants in Iran.

Methods: This research is a descriptive-correlational study. The population of this study were all flight attendants in one airline. 1250 people and 380 flight attendants were selected on the Morgan table, which included 190 men and 190 women as the sample. The instruments of this study were personality characteristics of NEO, coping strategies of Lazarous and Job Stress of Spilberger completed by self-reporting. All tools were standard and their reliability by Cronbach alpha was between 65% - 85%. Data were analyzed by Pearson correlation ($p < 0.01$) and using SPSS software.

Results: There was significant relationship between neuroticism and occupational stress ($r = 0.293$). In addition, there was relationship between neuroticism and avoidant-escape coping strategy ($r = 0.425$). But there was no relationship between coping strategies and occupational stress. Avoidant-escape coping strategy can be mediator role in relationship of neuroticism and occupational stress.

Discussion and Conclusion: Coping strategies have a different mediator in relationship of personality traits and occupational stress in flight attendants. There is a large range of factors and attributes airlines emphasize in their selection of flight attendants; I suggest the selection of flight attendants include assessment of personality traits and coping strategies.

P-11

AN ASSESSMENT OF PHYSICAL FITNESS IN CADET PILOTS BEFORE AND AFTER THE IMPLEMENTATION OF A PROGRAMME PREPARING FOR FLIGHTS

ÉVALUATION DE L'APTITUDE PHYSIQUE CHEZ LES PILOTES DE CADETS AVANT ET APRÈS LA MISE EN ŒUVRE D'UN PROGRAMME DE PRÉPARATION AUX VOLS:

Z Wochynski, P Krawczyk, K Cur, Z Kobos

Polish Air Force University, Deblin, Lubelskie, Poland

zbigniew.wochynski@op.pl

Introduction: The aim of the study is to examine the impact of the training programme on a directed physical fitness.

Methods: The research involved 35 male cadets, first year students of the Air Force University (PAFU) in Deblin. The examined persons were on average nineteen years of age. All the examined were divided into two groups: Group I (n=25 tested) carried out a programme on Special Aviation Gymnastic Instruments, and Group II (n=10 control) conducted the standard physical military education programme. In both groups, the test was performed twice before (examination I) and after (examination II) during the preparatory process, using the following tests: pull-ups, 16.5m race, 10x10m race, sit-ups, Aviation Synthetic Efficiency Test (ASET). The findings obtained in the tests were converted into points for the overall evaluation of physical fitness. The training lasted 70 days.

Results: In group I, in examination II, there was a statistically significant increase in the results of pull-ups ($p < 0.01$), 16.5m race ($p < 0.01$), 10x10m race ($p < 0.05$), sit-ups for 2 minutes ($p < 0.05$), and overall physical fitness ($p < 0.05$), compared to examination I. In group II, in examination II, the authors proved an insignificant increase in the findings when contrasted with examination I. The test results between group I and II did not show significant differences in the examined efficiency tests. In group I, in examination I, significant correlations were found between overall physical fitness and pull-ups, 10x10m race, 16.5m race, sit-ups and ASET. Examination II demonstrated significantly stronger correlations between the overall physical fitness and sit-ups as well as ASET. In group II, examination II showed a significant correlation between overall physical fitness and 16.5m race.

Conclusions: A significant correlation between overall physical fitness and ASET in examination II indicates an impact of the training programme on the targeted efficiency of the cadet pilots.

P-12

INFLUENCE OF THE ANNUAL TRAINING PROCESS OF CADET PILOTS ON GENERAL AND TARGETED PHYSICAL FITNESS

INFLUENCE DU PROCESSUS ANNUEL DE FORMATION DES PILOTES DE CADETS SUR L'APTITUDE PHYSIQUE GÉNÉRALE ET CIBLÉE

Z Wochynski, P Pilaczynski, K Wieclawski

Polish Air Force University, Deblin, Lubelskie, Poland

zbigniew.wochynski@op.pl

Introduction: Physical fitness is an elementary factor in the profession of a pilot. The aim of the study was to compare the results of physical fitness tests and to show the relationship between the overall physical fitness (total) and the Aeronautical Synthetic Efficiency Test (ASET).

Methods: The study population consisted of 19 male cadet pilots from the Polish Air Force University (PAFU) at the average age of 20. All subjects were assessed for physical fitness using the following tests: 3000 meters run, 100 meters run, standing long jump, pull ups and ASET. In order to determine the overall (total) physical fitness of the subjects, all test results were converted into points. The research was carried out twice: before and after the training process, which lasted a year.

Results: The results of the first study showed the highest significant correlation $r = 0.78$ ($p < 0.0001$) between the 3000 meter run and total physical fitness. There was also a significant correlation $r = 0.59$ ($p < 0.0001$) between total physical fitness and ASET. A significant correlation was also noticed between the standing long jump and ASET $r = 0.58$ ($p < 0.01$). The results of the second study showed that overall physical fitness significantly correlated with all tests except the standing long jump. ASET significantly correlated with the 100m/3000m run and the standing long jump. No significant correlation was observed between ASET and the pull-ups.

Conclusions: The results of the study showed a statistically significant increase in the total physical fitness in the second study in relation to the first study. In the second study, statistically significantly higher correlations between total physical fitness and ASET were found in relation to the first study.