

Stress on the spinal column in military trainee pilots

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Abstract

This preliminary study focuses on the forces that produce stress in military trainee aircraft pilots. Well known is spinal column stress while sitting. When flying, the acceleration and deceleration of the aircraft caused by various manoeuvres and acrobatics in the air, can cause stress on the bones and muscle tissues. This can, over time, become an occupational health problem. The results of a questionnaire study amongst 41 Brazilian Air Force cadets, will be combined with observational data from filming and task knowledge. Goal of this research is to come to a specific physical activity programme to prevent health problems, especially those related to the spinal column.

Introduction

Acceleration and deceleration during flight can cause chronic fatigue on the pilot's bones and soft tissues (muscles, tendons and ligaments). After a while this can lead to pain, inattention and a general feeling of discomfort. Obviously, this is a undesirable situation. For this reason the Physical Education Section of the Brazilian Air Force Academy is interested to increase the pilot's well-being, and to reduce discomfort and in this way increase performance. To get more information on the location of pains to be able to set up a prevention programme with mid and long-term effect, the present questionnaire study was performed.

On the ground acceleration forces are restricted, however, in flight, 3, 4 or even 5 G (i.e., 3, 4, or 5 times body weight) is common. These forces can cause micro traumas that become overt through located pain, chronic general fatigue and discomfort while seated or laying down. In aviation, three types of acceleration forces act on the aircraft (and pilot): the rectilinear acceleration, radial linear acceleration, and angular acceleration (MMA-160).

For example, when you "pull" 3G in the beginning of a looping, the pilot's body "weighs" three times its original weight. So, a pilot of 70 kg when pulling 3 G experiences a force equal to 210 kg "against the seat". Here the focus is on the spinal column and its surrounding tissues, as was done before in a case study of a pilot with lumbar region pain. (Kube, 1998).