Paper ID: 46442
oral

IAF/IAA SPACE LIFE SCIENCES SYMPOSIUM (A1)
Human Physiology in Space (2)

Author: Dr. Nicole Braun
Germany, nicole.braun@uni-wh.de

NEW FINDINGS ON SKIN PHYSIOLOGICAL PARAMETERS DURING LONG-TERM SPACEFLIGHT

Abstract

Skin reaction to space flight has not really been studied yet, although it has a very important barrier function to protect the body and can contribute to a more general understanding of physiology. It is proposed here to make a more thorough investigation of the skin during long term space flight, using non-invasive techniques. The aim of the present study is to investigate the kinetics and range of possible skin modifications during long duration spaceflights and their recovery. Here, the terrestrial skin conditions as well as on-orbit skin care habits were also taking into account. In order to investigate the effect on skin physiological parameters during spaceflight, measurements were carried out on 6 astronauts with respect to skin hydration, transepidermal water loss / barrier function and surface evaluation of the living skin in-orbit. Additional measured parameters on ground were: skin elasticity, skin density and thickness as well as microcirculation. Furthermore, a pre-flight questionnaire was given to the astronauts asking about their terrestrial skin care habits and skin conditions before launch. In addition, they were asked to fill out a post-flight questionnaire asking about their on-orbit skin care routine and whether any special observations regarding the skin were made during flight. Data from the test subjects (n=6) contradict the results obtained in the previous pilot study SkinCare with n=1. In the present study, no deterioration of the skin was found but rather an improvement in skin hydration, skin barrier function and no changes or improvement in the appearance of the skin surface. Furthermore, the skin density and skin thickness as well as skin elasticity values were unchanged from preflight values. However, a total of 23 skin symptoms were recorded by the astronauts during the mission. The symptoms were peeling, rash, dryness, severe dryness, reddening, itchiness, bruising, skin sensitivity, bumps, acne and slow healing of contusions and lacerations. Especially hands and feet were affected by skin problems. Surprisingly, two astronauts even experienced positive effects on their skin. In conclusion, we found that spaceflight under present conditions has no negative impact on measured skin physiological parameters. As a result of this examination, it was also shown that the self-reported skin symptoms might correlate with poor hygiene on-orbit, whereas the factor “environment” on the ISS plays a minor role.