IAF/IAA SPACE LIFE SCIENCES SYMPOSIUM (A1)
Behaviour, Performance and Psychosocial Issues in Space (1)

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EVALUATION OF ANXIETY IN SITUATION OF SHORT-TERM MICROGRAVITY (EVA-0G): SENSITIVITY OF PSYCHOLOGICAL PARAMETERS

Abstract

Introduction. Spatial environments expose astronauts to numerous stressors (physical, physiological and psychological). In this context, modifications of affective states may affect astronauts' performances. The aim of our project "EVA-0G" is to identify the most sensitive parameter (psychological, cognitive and physiological) of emotional changes in situation of microgravity. Thus, this present study used to parabolic flight in order to assess the influence of anxiogenic situation in microgravity on psychological parameters.

Methods. Experiments were performed during parabolic flights. Data are collected during parabolas (0G) and horizontal flight (1G). 12 male subjects have been recruited. In our study, there are two conditions: control and anxiogenic. Anxiogenic condition was created by the expectation of a stressor which is represented by white noises (95dB, 50 ms). Psychological parameters were assessed by questionnaires. Self-Assessment Manikin (SAM)(Bradley et Lang, 1994) was used to assess valence and arousal which are two dimensions of emotions. State-Trait Anxiety Inventory (STAI-YA) (Spielberger et al., 1983) and Visual Analogic Scales (VAS) were used to assess state-anxiety. All these questionnaires are filled out in the different experimental conditions (1G/0G, control/anxiogenic). SAM and VAS were performed during the flight. STAI-YA, which lasts longer, was performed at the end of the flight.

Results. Results of VAS confirm the anxiogenic effect of our stressor in 1G ($p<0.05$) and 0G ($p = 0.056$). Compared to 1G, valence measured by SAM increases in 0G in control ($p<0.05$) and anxiogenic ($p<0.05$) conditions. No difference between the experimental conditions was observed in STAI-YA and level of arousal.

Discussion. In agreement with literature, results of VAS suggests that exposure to the stressor (Hillman et al., 2005) and/or expectation of this stressor (Droit-Volet et al., 2010) increases state-anxiety in both 1G and 0G, despite the pleasant effect of 0G. Nevertheless, there are no differences between the experimental conditions in STAI-YA and level of arousal, which are two parameters related to the anxiogenic situation. In this specific context, all these results suggest that the subjects are able to detect the anxiogenic situation despite the pleasant effect of this experience. Only state-anxiety measured during the flight is sensitive to the anxiogenic situation. This suggests that questionnaires about state-anxiety filled out after the flight are not enough sensitive to the affective change related to anxiogenic situation in microgravity.

We thank CNES (French Spatial Agency) for their financial support.