

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

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EFFECT ON EMOTION OF 72 HOURS' SLEEP DEPRIVATION UNDER NARROW AND ISOLATED  
CIRCUMSTANCE

**Abstract**

**Objective:** To explore the influence on emotion of sleep deprivation under narrow and isolated circumstance which may confront during space missions and to explore effective mental countermeasures. **Methods:** 18 volunteers were divided into 6 groups. 4 groups participated in the research of Isolations-only and Sleep Deprivation, the other 2 groups took part in the research of Countermeasures. (Sleep Deprivation: each group was deprived of sleep for 72h under narrow and isolated circumstance. Isolations-only: the groups were allowed to rest from 23 to 7 o'clock, other aspects were just as the Sleep Deprivation. Countermeasures: the groups were trained how to integrate the group mental resource and how to battle drowsiness before and during the research, other aspects were just as the Sleep Deprivation.) Among the research, emotions of anxiety and depression were evaluated. fMRI was applied to research the volunteers' reaction on angry pictures of different intensity. **Results:** (1) Anxiety of Sleep Deprivation at the second morning and night, the third morning and night was more severe than Isolations-only. Anxiety of Sleep Deprivation at the second morning and night, the third morning and night was more severe than pre-test. Anxiety of Countermeasures at the first night, the second morning and the third night was lower than Sleep Deprivation ( $P<0.05$ ). (2) Trend of depression was similar with anxiety. The depression value at the first night, the second morning, the third morning and night was higher than Isolations-only. Depression of Sleep Deprivation at the first night, the third morning was more severe than pre-test. Depression of Countermeasures at the first night, the second morning and night, the third morning and night was lower than Sleep Deprivation ( $P<0.05$ ). (3) The results of fMRI exhibited that there was no change of reaction to higher-intensity angry pictures, but there was an increase of reaction to lower-intensity angry pictures

( $P < 0.05$ ). Conclusions: (1) There is no change of anxiety and depression of Isolations-only, but anxiety and depression of Sleep Deprivation ascend significantly. Mental training of conforming group mental resource can effectually antagonize the negative effect of Sleep Deprivation on anxiety and depression. (2) The threshold of negative emotions heightens and sensibility enhances due to Sleep Deprivation.