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THE EFFECT OF NATURAL SOUND: STRESS-RELATED SALIVARY AMYLASE AND MOOD STATES

Abstract

Keywords: natural sound, salivary amylase, stress, tension-anxiety, extreme environment.

Purpose: The study of stress response in extreme environment, the International Space Station, is needed. This study verified the hypothesis that the stimulation of natural sound reduces stress response.

Methods: Subjects were 12 healthy males (18-23 years old). Two visual stimuli (Go/Nogo task, that demands concentration and control, or natural images) and two auditory stimuli (white noise or natural sound as the sound of a stream including occasional birdcall) made four combinations. These were randomized and presented for three minutes each. After the bed rest as baseline, the four conditions were provided from computers via a high resolution head mounted display and high-quality sound headphones. Electroencephalogram, electrocardiogram, blood pressure, salivary amylase, and feelings (Profile of Mood States: POMS) were measured after each condition.

Results: One-way analysis of variance (ANOVA) of the salivary amylase disclosed significant period effect (p=0.005). The post-hoc multiple comparison tests of the amylase yielded significant reduction on natural sound. Natural images plus natural sound compared with natural images plus white noise (p=0.026), and Go/Nogo task plus natural sound compared with the task plus white noise (p=0.022). The one-way ANOVA of the Tension-Anxiety index of POMS test was also yielded a main effect (p=0.016). Natural sound significantly reduced Tension-Anxiety compared with white noise plus natural images (p¡0.05), and also with the noise plus Go/Nogo task (p¡0.05). The combination of natural sound plus natural images and natural sound plus Go/Nogo task decreased Tension-Anxiety index compared with the combination of Go/Nogo task plus white noise (p¡0.05). Equally, comparing the combination of natural sound plus natural images and Go/Nogo task plus white noise (p¡0.05), Go/Nogo task with natural sound and with white noise was also significantly different (p¡0.05).

Conclusion: Listening to natural ambient sound reduced Tension-Anxiety and the salivary stress related substance, amylase. Therefore, the hypothesis was supported.