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SLEEP DEPRIVATION AND NON-24 H ROTATING SCHEDULE DECREASE THE COGNITION
AND PERFORMANCE AND DISRUPT THE DIURNAL RHYTHMS

Abstract

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Most organisms on the Earth possess circadian rhythms in their physiology and behavior, which allow them to resonate with the cycling environment with a 24 h period. However, in human society a substantial quantity of jobs require non-24 h working/resting or shift schedules, which cause more or less misalignment in the circadian rhythms and disorders in consequence, e.g., in space missions. We have previously shown that the diurnal rhythms of heart rate, trunk activity and Psychomotor vigilance task (PVT) of three Chinese astronauts were changed during and after a space mission. In this work, we conducted a sleep deprivation and non-24 h working/rest scheduling experiment for 10 days in 11 subjects in total, and measured the changes in a series of physiological and cognitive parameters. The results show that though the subjects could sleep along with the schedule, their sleepiness increased significantly. The PVT data reveal that, compared to the control period, their reaction was significantly retarded. The saliva samples were collected for analysis of the changes in a number of saliva hormones and microbiota, which are to be completed in next several months. Together, this work would provide evidence and further our understanding of the impact of abnormal rest/working schedule on circadian rhythm, cognition and metabolism.