

عنوان مقاله:

Alteration of Functional Resting-State Networks in Partial Sleep Deprivation

محل انتشار:

ششمین کنگره بین المللی نقشه برداری مغز ایران (سال: 1398)

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خلاصه مقاله:

Many people experience partial sleep deprivation (PSD) in their life. PSD has serious effects on brain functions and leads to impaired emotional and cognitive functioning. In this study, we compared intrinsic brain networks between two groups of people who had normal sleep and only three hours of sleep, in order to assess the effect of PSD on intrinsic brain networks. Method We used online neuroimaging database of 75 subjects (30 female, average age=45.5 available at <https://www.openfmri.org/dataset/ds000201/>), which had been acquired in two conditions. The first condition was full sleep and another was partial sleep (i.e., three hours of sleep) and during their sleep, they were awoken several times during night by an alarm, and they stayed awake for a few minutes and sleep again. After preprocessing of neuroimaging data, group-ICA algorithm was applied using identified ten well-matched networks (i.e., constrained-ICA) in resting-state for each subject. Each ICA component has a corresponding timecourse; For the goal of examining the time domain, we then calculated a pattern matrix for each component separately for two mentioned conditions by correlating individual subjects time-series. finally, we ran statistical testing with FDR correction at the confidence level of 95% to see whether there is any difference between patterns in two conditions. Results We found that the correlation matrix for individual component patterns of visual occipital network, default mode network, salience network and left executive control network, showed statistics significant difference between normal sleep and PSD. Conclusions Our findings demonstrated the effects of PSD on the intrinsic brain networks such as default mode network, salience network and left executive control network, which are key regions for memory functions and social behavior. These study highlight the important impact of sleep duration on normal brain functioning.

کلمات کلیدی:

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