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Interconnections between Chronic Jet Lag and Neurological Disorders

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Abstract : Background: Patients with neurological disorders often display altered circadian rhythms. The disrupted circadian rhythms through chronic jetlag or shiftwork are thought to increase the risk and severity of human disease, including cancer, psychiatric, and related brain diseases. In this study, we investigated the impact of shiftwork or chronic jetlag (CJL) like conditions on mice's brains. Transcriptome profiling based on RNA sequencing revealed that genes associated with serious neurological disorders were differentially expressed in the nucleus accumbens (NAc) and prefrontal cortex (PFC). According to the qPCR analysis, several key regulatory genes associated with neurological disorders were significantly altered in the NAc, PFC, hypothalamus, hippocampus, and striatum. Serotonin levels and the expression levels of serotonin transporters and receptors were significantly altered in mice treated with CJL. Overall, these results indicate that CJL may increase the risk of neurological disorders by disrupting the key regulatory genes, biological functions, serotonin, and corticosterone. These molecular linkages can further be studied to investigate the mechanism underlying CJL or shiftwork-mediated neurological disorders in order to develop treatment strategies.

Keywords : chronic jetlag, molecular profiles, brain disorders, circadian rhythms
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