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Neurobehavioral profiling in a mouse model of shift work disorder

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Objective: To explore the effects of shift work disorder, with particular focus on elucidating possible neurobehavioral alterations.

Methods: To fully investigate the neurobehavioral alterations a chronic protocol of nine week was designed employing modified multiple platform model to induce paradoxical sleep alterations for 8 hours from Monday to Friday with recovery sleep at the weekend. Female Laca mice of age 2-3 months (n=20) were used after the approval from Institutional Animal Ethic Committee (IAEC). Assessments of neurobehavioral changes such as hyperactivity were done using open field test, actophotometer, zero maze and hyperactivity scoring, welfare assessment by nesting behavior, depression assessment by sucrose preference test and Porsolt swim test, memory assessment was done by Morris water maze and novel object recognition, prospective physiological assessment included body weight and body temperature.

Results: Neurobehavioral measures of shift work disorder demonstrated alterations at open field test, hyperactivity scoring, actophotometer, zero maze, body weight and body temperature after the animals were exposed to nine weeks shift work protocol. Laca mice demonstrated hyperactivity response denoted by significant increase in locomotor activity in actophotometer, open field test, zero maze and stereotypic behavior. Mice also showed loss in body weight along with increase in body temperature. No changes were observed in mean escape latency assessed by Morris water maze, preference index in novel object recognition, immobility period in Porsolt swim test, percentage preference to sucrose in sucrose preference test.

Conclusion: This work has important implications for shift workers, particularly concerning awareness of possible development of Mania and likely implementation/adherence challenges. Findings also pave the way for testable hypotheses concerning possible mechanisms of action involved in Mania like behavior induced by shift work disorder.

Biography

Shiyana is pursuing her PhD from Panjab University, Chandigarh. She is UGC RFSMS Fellow. She has published 2 papers in reputed journals and has worked on acute kidney injury in her masters. Currently she is working on sleep deprivation induced neurobehavioral deficits.

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