Evaluate the effect of modified post-traumatic stress disorder (PTSD) rodents model on sleep alteration and anxiety behavior

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Objective: In this study, we established effective combinations of chronic stressors to successfully induce the post-traumatic stress disorder (PTSD)-like behaviors in rat. We also evaluated the short-term and long-term alterations of sleep after administrated with PTSD-like stressors.

Methods: Male Sprague-Dawley rats (250-500 g; BioLASCO, Taiwan) were used in present study. Rats were randomly receiving a series of stressors at the beginning of the light period, which including 2-h of restraint, 20-min of force swim, 12-time inescapable footshock stimulation (each paired with a cue tone) in 10 mins, and anesthetized with isoflurane, for 7 continuous days. Context and cue simulations were applied at the following days to retrieve their fear memory. Freezing behavior was detected during 10 min of context or cue memory recalling process. Open field test and elevated plus maze were used to evaluate the anxiety level for short term and long term observation after exposure to context or cue tones. Sleep-wake activity was recorded every day in this research to investigate alteration in sleep amounts and slow wave activity (SWA) during non-rapid eye movement (NREM) sleep.

Results: After rats received the stressors, their body weights were dramatically decreased at first 3 weeks. Comparing with the control group (receives context and cue tone without stressor), PTSD rats demonstrated higher percentage of freezing behavior at the memory recall days. Open field test and elevated plus maze showed lower traveled distance and velocity in PTSD rats at short-term tasks, which indicated the stressors increased the anxiety level for at least 3 weeks. Theta power of sleep-wake activity was also increased at first 3 weeks. Slow wave activity (SWA) during NREM sleep was decreased comparing with the baseline, indicating that the stressors causing poor sleep quality in NREM sleep.

Conclusion: The modified PTSD model decreases body weight, increases anxiety level and causes poor NREM sleep quality after recalling fear memory with context environment or cue tones.

中文題目：評估改良之齧齒類創傷後壓力症候群模式對睡眠及焦慮行為產生的影響

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