ROLES OF THE REWARD SYSTEM IN SLEEP, DREAMING AND THE CONSOLIDATION OF EMOTIONAL MEMORIES

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Objectives: The present project aimed at providing new data concerning the role of the dopaminergic-reward system in the regulation of sleep, dreaming, and daytime emotional functions. We previously suggested that abnormal sleep behaviors, i.e., as found in parasomnias, may relate to an increased activity of the reward system during sleep. Because nightmares and sleepwalking predominate during REM and NREM sleep respectively, here we tested whether exploratory excitability, a waking personality trait reflecting high activity within the mesolimbic dopaminergic (ML-DA) system, may be associated with specific changes in REM and NREM sleep patterns in these two sleep disorders.

Methods: 24 unmedicated patients with parasomnia (12 with chronic sleepwalking and 12 with idiopathic nightmares) and no psychiatric comorbidities were studied. Each patient spent one night of sleep monitored by polysomnography. The Temperament and Character Inventory (TCI) was administered to all patients and healthy controls from the Geneva population (n = 293).

Results: Sleepwalkers were more anxious than patients with idiopathic nightmares (Spielberger Trait anxiety/STAI-T), but the patient groups did not differ on any personality dimension as estimated by the TCI. Compared to controls, all parasomnia patients scored higher on the Novelty Seeking (NS) TCI scale and in particular on the exploratory excitability/cURIosity (NS1) subscale, and lower on the Self-directedness (SD) TCI scale, suggesting a general increase in reward sensitivity and impulsivity. Furthermore, parasomnia patients tended to worry about social separation persistently, as indicated by greater anticipatory worry (HA1) and dependence on social attachment (RD3). Moreover, exploratory excitability (NS1) correlated positively with the severity of parasomnia (i.e., the frequency of self-reported occurrences of nightmares and sleepwalking), and with time spent in REM sleep in patients with nightmares.

Conclusions: These results suggest that patients with parasomnia share common waking personality traits associated to reward-related brain functions. Our findings have important theoretical implications, as they support the hypothesis that reward networks are activated during human sleep, and clinical implications pertaining to the pathophysiology of parasomnias, as they reveal specific personality characteristics of patients with parasomnias, which could potentially be targeted by psychotherapy.
Publications:

Main publication of the project

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