

The Clocks and their Roles in the Concept of Bruxism: Challenges and Opportunities

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The understanding of bruxism has evolved to recognize it as a complex, multifaceted behavior that is state-dependent and modulated by circadian influences. Traditional classification divides bruxism into awake and sleep-related forms, yet this binary approach may overlook critical rhythmic and physiological variations. This presentation addresses the necessity of rethinking bruxism within a circadian framework, which encompasses the oscillatory patterns of bruxism activity across the 24-hour day. Evidence indicates that bruxism exhibits distinct circadian profiles, with specific patterns of intensity and frequency in sleep versus wakefulness. These circadian rhythms are not merely passive markers but are actively shaped by both central and peripheral biological clocks. Understanding bruxism through this lens highlights the influence of the circadian system on physiological responses such as autonomic activity, muscle function, and arousal states, which are known to vary across the day. This conceptualization opens new opportunities for clinical assessment and therapeutic approaches that are time-sensitive and state-specific. By aligning bruxism management strategies with these rhythmic patterns, interventions may better address the fluctuating nature of bruxism. This state-dependent circadian approach also introduces challenges, such as the need for continuous monitoring tools and personalized treatments that consider individual circadian variation. Ultimately, re-envisioning bruxism as a circadian-modulated behavior may enhance our understanding of its underlying pathophysiology, improve diagnostic precision, and optimize treatment outcomes. Authors will present updated insights on the chronobiological-related mechanisms on bruxism with focus on the circadian influences both on the neurobiological substrates and behavioral manifestations of this prevalent exacerbated motor activity.

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