

# Temporal relationship between sleep-time masseter muscle activity and apnea-hypopnea events: a pilot study

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## Abstract

**Study objectives:** The aim of this study was to investigate the correlation between sleep bruxism (SB)-related masseter muscle activity (MMA) and apnea-hypopnea events as well as to assess their temporal sequence.

**Methods:** Thirty (N=30) patients with sleep respiratory disorders and clinical suspicion of sleep bruxism (SB) were recruited. Ambulatory polygraphic recording was performed to detect apnea-hypopnea events (AHEs) and sleep bruxism episodes (SBEs). Pearson test was used to assess the correlation between apnea-hypopnea index (AHI) and SB index (SBI). A five-second time window with respect to the respiratory events was considered to describe the temporal distribution of SBEs. Furthermore, SBI was compared between groups of patients with different AHI severity (i.e., mild, moderate and severe) using ANOVA analysis.

**Results:** On average, AHI was  $27.1 \pm 21.8$  and SBI  $9.1 \pm 7.5$ . No correlation was shown between AHI and SBI. Most of SBEs (66.8%) occurred without a temporal relation with respiratory events. Considering obstructive sleep apnea (OA), 65.7% of SBEs occurred within five seconds after AHEs, whilst in the case of central apnea (CA) 83.8% of SBEs occurred before the respiratory event. The participants with severe apnea (N=9) show a tendency to have higher bruxism indexes when compare to patients with mild (N=11) and moderate apnea (N=10).

**Conclusions:** Findings suggest that: 1. At the study population level, there is no correlation between AHI and SBI, as well as any temporal relationship between SBEs and respiratory events, and 2. Specific patterns of temporal relationship might be identified with future studies focusing on the different types of apnea-hypopnea events and bruxism activities.

**Keywords:** Obstructive sleep apnea-hypopnea; central apnea-hypopnea; masseter muscular activity; mixed apnea-hypopnea; sleep bruxism; sleep-disordered breathing.

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