

Thalamocortical abnormalities

Thalamocortical abnormalities have been implicated in the pathophysiology of [restless legs syndrome \(RLS\)](#).

Cha et al. hypothesized that sleep spindle and slow oscillation (SO) activity is impaired in RLS, and that this dysfunction may contribute to sleep disturbance in these patients. To address this issue, we characterized sleep spindle and SO activity in RLS.

Fifteen drug-naïve, idiopathic RLS patients (13 female and 2 male) and 15 female healthy controls participated in this study. Nineteen-channel electroencephalograms were obtained during polysomnographic (PSG) recordings. An automated sleep spindle and SO detection algorithm was used to detect sleep spindle (12-16 Hz) and SO (<1 Hz) activity. The quantitative characteristics of sleep spindle and SO activity were investigated.

Compared with the healthy controls, in RLS patients, we observed density and power reduction in sleep spindles. In SOs, density reduction and duration increment were shown in RLS patients. In addition, SO-spindle coordination was deficient in RLS as revealed by reduced SO locked spindle power, dispersed and delayed spindle phase, and decreased SO-spindle coupling. Although sleep spindle power was negatively correlated with wake after sleep onset (WASO) time, SO duration was positively correlated with the arousal index in RLS.

This study suggests that sleep disturbances may be mediated by a combined deficit in spindle and SO activity and SO-spindle coordination. The abnormal SO and spindle activity observed in RLS support the notion that thalamocortical abnormalities underlie this condition and may promote disturbed sleep integrity ¹⁾.

¹⁾

Cha KS, Kim TJ, Jun JS, Byun JI, Sunwoo JS, Shin JW, Kim KH, Lee SK, Jung KY. Impaired slow oscillation, sleep spindle, and slow oscillation-spindle coordination in patients with idiopathic restless legs syndrome. Sleep Med. 2019 Oct 31;66:139-147. doi: 10.1016/j.sleep.2019.09.021. [Epub ahead of print] PubMed PMID: 31877505.

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