

Apnoeic and Hypopnoeic Load in Obstructive Sleep Apnoea: Correlation with Epworth Sleepiness Scale

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Abstract

Introduction: Patients with obstructive sleep apnoea (OSA) often present with excessive daytime sleepiness (EDS) as measured by the Epworth Sleepiness Scale (ESS). However, the relationship between EDS and OSA severity as measured by the apnoea-hypopnoea index (AHI) remains inconsistent. We hypothesise that this may be due to the usage and equal weightage of apnoea and hypopnoea events used in determining AHI and that apnoea and hypopnoea load as measured by their total durations may be a better metric to use. We sought to investigate if apnoea or hypopnoea load can display better correlation with ESS. **Materials and Methods:** Retrospective analysis of 821 patients with AHI ≥ 5 , who underwent in-laboratory polysomnogram for suspected OSA from January 2015 - December 2015, was performed. Objective factors on polysomnogram were correlated with ESS. **Results:** ESS was correlated with age ($r = -0.148$, $P < 0.001$), number of apnoeas ($r = 0.096$, $P = 0.006$), apnoea load ($r = 0.102$, $P = 0.003$), apnoea index ($r = 0.075$, $P = 0.032$), number of desaturations ($r = 0.081$, $P = 0.020$), minimum SpO₂ ($r = -0.071$, $P = 0.041$), time SpO₂ $< 85\%$ ($r = 0.075$, $P = 0.031$) and REM sleep duration ($r = 0.099$, $P = 0.004$). Linear regression analysis found age ($P < 0.001$), apnoea load ($P = 0.005$), REM ($P = 0.021$) and stage 1 sleep duration ($P = 0.042$) as independent factors correlated to ESS. The apnoea load calculated using duration in apnoea correlate with ESS in patients with severe OSA by AHI criteria compared to the mild category. **Conclusion:** AHI does not correlate with ESS. Younger age, longer apnoea, stage 1 and REM sleep were independently related to higher ESS though the correlations were weak. Apnoea load should be taken into account when determining OSA severity.

Ann Acad Med Singapore 2018;47:216-22

Key words: Apnoea duration, Epworth sleepiness scale

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