

# Association of sleep time in supine position with apnea-hypopnea index as evidenced by successive polysomnography

Gokhan Yalciner<sup>1</sup> · Mehmet Ali Babademez<sup>2</sup> · Fatih Gul<sup>3</sup> Received: 26 April 2016 / Revised: 25 July 2016 / Accepted: 25 August 2016 / Published online: 29 August 2016  
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## Abstract

**Purpose** The purpose of this study is to evaluate the impact of body position during sleep on apnea-hypopnea index (AHI) and night-to-night variability in polysomnography (PSG) parameters.

**Methods** Totally, 30 patients with obstructive sleep apnea syndrome (OSAS) were assessed prospectively with successive PSGs performed. The patients were categorized as increased (group A), decreased (group B), and unchanged (group C) AHI between the first and second PSG evaluations performed at least 1-week interval.

**Results** The mean AHI values were significantly higher in the second night ( $p = 0.02$ ). A change in AHI was found in almost 85 % of the patients between two successive measurements. According to multivariate and correlation analyses and differences in total AHI in supine position ( $r = 0.897$ ), it was found that the influence of the supine position was the primary factor contributing to the night-to-night variability. Supine AHI, non-supine AHI, and non-supine time findings did not add any significance on total AHI.

**Conclusions** The variability observed in the AHI seems related to amount of sleeping time spent in supine position, suggesting that mean AHI alone is not that reliable in the accurate diagnosis of OSAS severity. A thorough evaluation of AHI in supine and non-supine positions is needed in order to understand better the severity of OSAS.

**Keywords** Sleep apnea · Polysomnography · Apnea-hypopnea index · Sleep position · Supin time

## Introduction

As measured by the apnea-hypopnea index (AHI), there are considerable variances in the severity of obstructive sleep apnea (OSA), which can be explained by several factors including body position. Supine position makes the upper airway collapsible, which is thought to be responsible for the worsening of OSA compared with non-supine position by the tongue and mandible [1]. However, it is unclear how much variability in time spent supine contributes to total AHI.

In previous studies, to determine the severity of OSA, the effect of parameters of PSG on total AHI was evaluated in single night or night-to-night studies. In single night studies, more than 60 % of the patients with OSA was considered to have a positional obstructive sleep apnea (POSA), a condition in which the AHI is at least twice as high in the supine position compared with non-supine positions. In POSA patients, the degree of severity of OSA was thought to be mostly related to the sleep time spent in the supine position [2]. There are several studies about the variability of AHI across two nights, commonly referred to as night-to-night variability. It was understood that many factors such as an unfamiliar environment of the sleep laboratory, anxiety because of being observed, uncomfortable feelings resulting from electrodes and wires

✉ Fatih Gul  
drfatihgul@gmail.com

Gokhan Yalciner  
gkhnyalciner@gmail.com

Mehmet Ali Babademez  
mababademez@gmail.com

<sup>1</sup> Department of Otorhinolaryngology, Head and Neck Surgery, Ataturk Training and Research Hospital, Ankara, Turkey

<sup>2</sup> Department of Otorhinolaryngology, Head and Neck Surgery, Yıldırım Beyazıt University School of Medicine, Ankara, Turkey

<sup>3</sup> Department of Otorhinolaryngology, Head and Neck Surgery, Bitlis Tatvan State Hospital, Tatvan, Bitlis, Turkey