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ORIGINAL ARTICLE

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Prevalence of signs and symptoms of laryngopharyngeal reflux in snorers with suspected obstructive sleep apnea

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Abstract

Obstructive sleep apnea (OSA) is believed to be correlated with laryngopharyngeal reflux (LPR).

Objective: To study the prevalence of signs and symptoms of reflux in snorers with suspected OSA.

Method: This cross-sectional study enrolled 74 patients assessed positive for OSA with the Berlin questionnaire. The subjects were followed up at the sleep disorder ward of a university center. Studied variables included the BMI, the Epworth sleepiness scale, the reflux symptom index (RSI), the reflux finding score (RFS), and their subdomains related to increased inflammation. The correlations between sleep questionnaires, reflux scales, and their subdomains were deemed statistically significant when $p < 0.05$.

Results: Ninety-eight percent of the subjects had symptoms and signs suggestive of LPR; prevalence was significantly higher among obese individuals ($p = 0.002$).

Conclusion: The significant difference seen in the prevalence of signs of inflammation suggestive of LPR when obese and non-obese subjects with suspected OSA were compared indicates that obesity may affect inflammatory findings of the pharynx and larynx. The high prevalence of symptoms and signs of reflux in patients with suspected OSA calls for more studies on the matter.

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INTRODUCTION

Primary snoring and obstructive sleep apnea (OSA) are highly prevalent in the general population[1-4], as is gastroesophageal reflux disease (GERD) and its gastroesophageal manifestation, laryngopharyngeal reflux (LPR)[5-8], affecting 20%[1] and 20%-40%[9,10] of the adult population respectively. Respiratory sleep disorders have significant impact upon the health and quality of life of patients, and have been correlated with higher risk of automotive accidents caused by diurnal sleepiness or attention deficit[2], and cardiovascular disease[3,4]. The annual cost of treating the medical consequences of sleep apnea in the United States has been estimated at US$ 3.4 billion[1]. There is no data on the socioeconomic impact of this condition in Brazil. Similarly, laryngopharyngeal reflux may introduce significant morbidity and greatly impact the quality of life of individuals[9,10].

An association between the two conditions has been suggested in the literature[11,12], yet it is still unclear whether they share the same risk factors and coexist in the same populations (i.e., overweight adult subjects aged 40 and older)[13]. If such association exists, it is not clear whether reflux episodes are the cause or one of the consequences of apnea or obesity.

Descriptions of the association between laryngopharyngeal reflux and OSA are based on the possible inflammatory impact of gastroduodenal contents upon the pharynx and larynx, causing inflammation and reduction of the lumen of the upper airways[12,14], in addition to possible local alterations in the mechanoreceptors of the pharynx[12,14,15] and vagal hyperactivity leading to laryngospasm and coughing[16].

Obesity is possibly the most common risk factor correlated with these diseases, and may easily help explain apnea and reflux episodes caused by reductions in upper airway patency associated with increased intra-abdominal pressure and reduced intrathoracic pressure[11,12,17]. However, a strictly causal association has not been established yet or even individualized for each of the comorbidities.

Despite the descriptions of a possible correlation between OSA and LPR, population studies designed with this purpose are needed to shed light on the matter. Therefore, this descriptive cohort study aimed to assess the prevalence of symptoms and signs of LPR in snorers with OSA.

METHOD

This study was approved by the institution's Human Research Ethics Committee and given permit (# 015/12) A total of 170 consecutive patients seen at the sleep disorder clinic of a tertiary care hospital were recruited between May and December of 2012. The following enrollment criteria were applied: age between 21 and 65 years and positive scores in the Berlin Questionnaire[1,3]. The exclusion criteria were as follows: history of smoking or alcohol consumption, history of chronic inflammation or head and neck tumors, and prior digestive tract and/or head and neck surgery. The size of the sample was calculated based on the prevalence of each of the studied diseases in the population in general and the number of patients seen in the sleep disorder clinic of a reference hospital in the city of São Paulo. Calculations indicated that samples of 60 or more subjects would meet the statistical significance requirements for a descriptive cohort study.

All patients underwent physical examination. Subjects had their body mass indexes (BMI) calculated and answered specific questionnaires to assess how likely they were of having OSA and LPR. Laryngoscopy was performed to assess signs of inflammation in the laryngopharyngeal segment. The patients who failed to complete the tests were excluded from the study.

In order to assess the impact of obesity in both conditions, patients were subdivided based on their BMIs into two groups: Group I (non-obese) - subjects with BMI < 30 and Group II (obese) - subjects with BMI ≥ 30 < 40. Morbidly obese patients were not included in the study (BMI > 40).

Cases of suspected obstructive sleep apnea were characterized with the aid of the Epworth sleepiness scale, a validated tool used to assess the chances of patients falling asleep in eight everyday life situations, in which scores greater than 10 have been strongly correlated with OSA[18].

Similarly, cases of suspected laryngopharyngeal reflux were identified through the analysis of symptoms and signs of disease by two validated instruments, the reflux symptom index (RSI)[19] and the reflux finding score (RFS)[20,21]. Subjects with RSI scores ≥ 13 and RFS scores ≥ 7 were considered positive for LPR[19-21].

More specific analysis was carried out to study the specific subscales of the scales mentioned above possibly associated with inflammation in the laryngopharyngeal segment and airway patency involvement. The specific variables considered in the RSI were: pharyngeal globus, hawking, and difficulty swallowing. The variables selected in the RFS were: ventricular obliteration, vocal fold edema, diffuse laryngeal edema, and posterior commissure hypertrophy.

For the purposes of statistical calculations, all subscales of the studied symptoms were subdivided into score-based categories: scores of 0, 1, and 2 were ranked as mild/moderate; and scores of 3, 4, and 5 were considered moderate/severe. Laryngoscopy findings such as vocal fold edema, diffuse laryngeal edema, and posterior commissure hypertrophy with scores ranging from 0 to 4 to reflect intensity of involvement were grouped as follows: scores of 0, 1, and 2 were considered mild/moderate; scores of