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ORIGINAL ARTICLE

Influence of obesity on the correlation between laryngopharyngeal reflux and obstructive sleep apnea[☆]

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KEYWORDS

Sleep apnea
obstructive;
Obesity;
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Abstract

Introduction: The obstructive sleep apnea (OSA) is caused by recurrent episodes of partial or total obstruction of the upper airway lasting more than 10 seconds during sleep. Laryngopharyngeal reflux (LPR) is a variant of the disease Gastroesophageal Reflux that affects the larynx and pharynx. **Objectives:** Evaluate the influence of obesity on the relationship between RFL and OSAS in patients with OSA.

Materials and methods: An observational retrospective cross. We reviewed care protocol for patients with OSA that includes validated questionnaires for RFL as Symptom Reflux Index (RSI) and Reflux Finding Score (RSI), and polysomnography nasolaryngofibrosocopia.

Results: 105 patients were divided into obese group (39 patients) and non-obese patients (66 patients). In the evaluation of the mean RSI group of non-obese was similar between patients with mild OSA (11.96) and moderate (11.43). In the obese group the mean RSI was 6.7 in patients with mild OSA and 11.53 in patients with moderate to severe OSA ($p < 0.05$).

Discussion: The subgroup of patients with OSA and RFL have several factors that promote inflammation of the upper airway. Patients with OSA should be screened and treated as the RFL increasing the quality of life.

Conclusion: The RFL are positively correlated and OSAS in obese patients.

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PALAVRAS-CHAVE

Apneia obstrutiva do sono;
Obesidade;
Laringite

Influência da obesidade na correlação entre refluxo faringolaríngeo e apneia obstrutiva do sono

Resumo

Introdução: A apneia obstrutiva do sono (AOS) é causada por episódios recorrentes de obstrução total ou parcial da via aérea superior com duração superior a 10 segundos durante o sono. Refluxo faringolaríngeo (RFL) é uma variante da doença do refluxo gastroesofágico que afeta a laringe e a faringe.

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Objetivos: Avaliar a influência da obesidade na relação entre RFL e AOS em pacientes com SAOS. **Materiais e métodos:** Estudo observacional transversal retrospectivo. Foram revisados protocolos de atendimento de pacientes com AOS que incluem questionários validados para RFL como Reflux Symptom Index (RSI) e Reflux Finding Score (RFS), nasolaringofibroscoopia e polissonografia. **Resultados:** Cento e cinco pacientes foram divididos em grupo de obesos (39 pacientes) e não obesos (66 pacientes). Na avaliação das médias do RSI o grupo de não obesos foi semelhante entre pacientes com AOS leve (11,96) e moderada (11,43). No grupo de obesos a média do RSI foi de 6,7 em pacientes com AOS leve e de 11,53 em pacientes com AOS moderada a grave ($p < 0,05$). **Discussão:** O subgrupo de pacientes com AOS e RFL apresenta vários fatores que promovem a inflamação da via aérea superior. Pacientes com AOS devem ser pesquisados e tratados quanto a RFL, aumentando a qualidade de vida.

Conclusão: O RFL e a AOS se correlacionam positivamente em pacientes obesos.

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Introduction

Obstructive sleep apnea (OSA) is caused by recurrent episodes of partial or complete obstruction of the upper airways (UAs) lasting more than 10 seconds during sleep, causing a decrease in oxyhemoglobin saturation and an increase in adrenergic discharge. A thorough upper airway assessment is very important to evaluate the obstruction points. In 1999, the American Academy of Sleep Medicine¹ established the diagnostic criteria for OSA, which included presence of excessive daytime sleepiness not explained by other factors; presence of at least two of the following: nocturnal choking, recurrent arousals, unrefreshing sleep, daytime fatigue, and decrease in concentration; and presence of apnea-hypopnea index (AHI) score greater than five events per hour, a mandatory criterion.

The pathophysiology of OSA has not yet been fully elucidated. During respiratory events, there is a decrease in oxygen saturation, which leads to baroreflex activation, triggering a generalized activation of the sympathetic autonomic nervous system. There is an adrenergic discharge leading to peaks of tachycardia and hypertension. This process is repeated several times during sleep in apneic patients and, in the long-term, it leads to high sensitivity of the peripheral chemoreflex, with exaggerated response even in normoxia, baroreflex dysfunction, increased adrenergic discharge, cardiovascular dysfunction in the long term, systemic inflammation, and metabolic dysregulation with insulin resistance and type II diabetes mellitus.² All these alterations result in chronic inflammation of the entire upper airway, leading to the appearance of the varied symptoms in these patients.

Studies have demonstrated the diversity of OSA prevalence, as it can affect children, young adults, and the elderly. It is associated with different risk factors such as anatomical abnormalities, diseases, and habits. An epidemiological study performed in São Paulo, Brazil showed that the prevalence of OSA was 32.8% of the adult population of the city. The risk factors associated with the development of the syndrome were male gender, body mass index (BMI) $> 25 \text{ kg/m}^2$, low socioeconomic status, age, and menopausal status.³ Snoring has a prevalence of 19.1% among men and 7.9% among women in the population aged 30 to 60 years.⁴

Approximately 20% of the adult population complains of snoring, a figure that increases to 60% when considering males older than 40 years of age.⁵

Laryngopharyngeal reflux (LPR) is a variant of the gastroesophageal reflux disease (GERD) that affects the larynx and pharynx. In most cases, it is secondary to retrograde flow of gastric contents into the laryngopharynx, resulting in a series of laryngeal signs and symptoms.⁶ It has become one of the most common conditions in otorhinolaryngology. It is diagnosed in approximately 10% of patients with otorhinolaryngological symptoms and in at least 50% of patients with voice-related complaints.⁷ Obesity has also been recognized as an important factor, which is increasingly more prevalent in the world's population.

LPR tends to occur during the day and has no clear association with obesity, in contrast to GERD.

Belafsky et al. validated two questionnaires for the systematic evaluation of the LPR-related complaints. The first, called the Reflux Symptom Index (RSI), assesses LPR symptoms. The scale consists of nine items scored 0 to 5, with a minimum score of 0 (asymptomatic) and maximum of 45.8. An RSI index ≥ 13 is considered to be suggestive of LPR.

The other scale developed by Belafsky et al. is the Reflux Finding Score (RFS) of laryngoscopic findings suggestive of LPR. An LPR score > 7 is considered positive for LPR.⁸

OSA and LPR are two conditions that cause chronic upper airway inflammation. Symptoms such as hoarseness, pharyngeal globus, dysphagia, and choking are observed in both diseases. The association between OSA and LPR has been discussed in the literature in recent years, but the correlation between the two diseases has not reached a consensus. Gastroesophageal motility is decreased during sleep. Intraesophageal pressure is decreased in patients with OSA, but Kuribayashi et al. demonstrated that the upper esophageal sphincter and the gastroesophageal junction increase their tone, decreasing LPR events.⁹

The presence of LPR or GERD is associated with an increased number of awakenings, regardless of the presence of OSA. Patients with mild to moderate OSA experience greater influence from LPR on the number of awakenings than patients with severe OSA. Few studies have evaluated the influence of obesity on the association between OSA and LPR. Thus, this assessment is relevant, since the incidence of obesity has

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