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ONLINE ARTICLE*

Brazilian consensus of snoring and sleep apnea – aspects of interest for orthodontists

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Abstract

The objective of this article is to clarify the positions of the medical societies that have worked together to establish a consensus regarding the clinical and laboratory parameters involved in sleep-disordered breathing, particularly snoring and obstructive sleep apnea syndrome (OSAS). Orthodontists have gradually come to take part in multidisciplinary teams that act in the area of human sleep, but few know about the uniformity coordinated by the Brazilian Association of Sleep. Clinical and scientific studies from the field of dentistry (particularly orthodontics) also must observe and follow these diagnosis and treatment criteria established by the Brazilian medical community.

Keywords: Sleep apnea. Obstructive. Snoring. Polysomnography.

Editor's summary

Orthodontists that work or plan to work in the area of sleep disorders should primarily acquire in-depth knowledge of the clinical and laboratory parameters to diagnose them, the definitions established so far, and the limits of their specialization in relation to the multidisciplinary teams that follow up and treat patients with respiratory sleep disorders.

Obstructive sleep apnea (OSA), a multifactor syndrome not fully understood yet, is partly assigned to anatomic changes of the upper airways and the craniofacial bones associated with neuromuscular abnormalities of the pharynx. It is characterized by recurrent upper airway obstructive episodes during sleep. The obstruction is continuous and involves waking up due to the increased respiratory effort and the blockage, reduction (hypopnea) or complete cessation (apnea) of the airflow in the presence of respiratory movements. The events are often ended by brief awakenings. The most common symptoms

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are tiredness upon awakening and sensation of non-refreshing sleep regardless of its duration, excessive daytime sleepiness and poor quality of life. Predisposing factors are: obesity, and central obesity in special; male sex; craniofacial abnormalities, such as maxillary or mandibular hypoplasia; augmented pharyngeal soft and lymphoid tissues; nasal obstruction; endocrine abnormalities, such as hyperthyroidism; acromegaly; and family history. Associated factors are systemic hypertension; pulmonary hypertension; cardiac arrhythmia associated with sleep, nocturnal angina, gastroesophageal reflux, impairment of quality of life, cognition and sleep.

Dentists may request a polysomnographic evaluation when OSA is suspected, and the final diagnosis of sleep disorder, its severity and the evaluation of comorbidities are made by a physician according to polysomnographic findings. Orthodontists play an important role in the detection of pharyngeal obstructive sites, in the orthopedic or surgical evaluation and treatment of the maxillary or mandibular disorders, as well as the treatment of OSA using intraoral devices.

Questions for the authors

1) Is the prevalence of OSA high in Brazil? What factors are involved in the etiology of this disorder?

Although epidemiological studies in other countries showed that the prevalence of obstructive sleep apnea (OSA) syndrome among adults may range from 2 to 10%, a recent study published by the Sleep Biology and Medicine team of UNIFESP (Department of Psychobiology) found alarming figures. According to that study, OSA prevalence was 32.9% among the adult population in the city of São Paulo, 40.6% among men and 26.1% among women. This study was very important and was conducted with a randomized population sample in which all volunteers responded questionnaires and underwent whole night polysomnography in a sleep laboratory, the standard criterion for OSA diagnosis. Notably, as expected, prevalence was greater among older individuals with a greater body mass index (BMI); that is, more advanced age and greater weight indicated higher chances of having OSA. Moreover, according to the same study, 60% of the adult population in the city of São Paulo has a BMI greater than 25 kg/m^2, and 22% of this population is obese, with a BMI greater than 30 kg/m^2. For that reason, the rates mentioned above should not be extrapolated to the Brazilian population.

The physiopathology of OSA has not been fully determined because the narrowing of upper airways during sleep and their consequent collapse has multifactor causes. Anatomic, functional and neuromuscular factors are involved. The size and the spatial relations of the upper airways are defined by soft tissue, muscles and the craniofacial bones, which directly affect the shape and size of the pharynx. Some of the anatomic factors that may be directly associated with obstruction are: fatty tissue in the pharynx; tonsil or adenoid hypertrophy; increased tongue size (macroglossia); and factors associated with craniofacial development and growth, such as mandibular or maxillary retrognathism, micrognathia and narrowing of the dental arches.

Obesity seems to be the main risk factor for OSA; in non-obese patients, changes in the growth of the lower facial third seem to be the major factor in the development of this syndrome. Functional factors, such as augmented upper airway complacency, and neuromuscular factors have also been studied. Little is known about the latter, but studies have shown that there is a reduction in

the ventilator drive and in the activity of the dilating muscles of the pharynx. In OAS, a mechanism to compensate for the nocturnal obstructive episodes is active during waking hours and increases the activity of pharyngeal muscles. During sleep, the opposite is true, and a decrease in muscle tonus may lead to upper airway collapse. However, these factors are still under analysis. Collapse may occur in the retropalatal or retrolingual areas, or in both, and it is a dynamic process that involves anatomic changes and the neuromuscular activity of the whole pharynx. These concepts are fundamental to indicate and select the most appropriate treatment. The narrowing and collapsibility of the upper airway during sleep involves several factors, rather than only a previously narrow and short airway, easily detected during physical examination.

2) Has the role of orthodontists been clearly outlined in the treatment of sleep disorders?

Dentistry has gained room in sleep medicine in the last few years thanks to the work conducted by specialist in multidisciplinary teams who are directly or indirectly associated with teams that work with sleep medicine. The study published in this issue provides a good discussion of the role of dentists in general and orthodontists in particular in the diagnosis and treatment of respiratory sleep disorders.

3) What advances does the future hold for the treatment of sleep apnea?

Studies in the area of sleep medicine about the treatment of OSA have advanced towards new treatments, improvements in existing therapies, and attempts to demonstrate not only improvements in clinical conditions, but also the resolution of cardiovascular and cognitive consequences that affect individuals with OSA.

Besides the clinical treatments already widely accepted, such as CPAP and IOA, there are novel therapeutic approaches under investigation. Several of them aim at complementing treatment that does not achieve totally effective results. Here we may include speech therapy, which, by means of exercises, aims at improving the tonus of the pharyngeal muscles. The same may be said of acupuncture, which may also help to improve respiratory sleep disorders. At the same time, surgical treatments, particularly orthognathic surgeries, have been studied in well designed trials to demonstrate their expected positive results.

At the same time, studies have confirmed results of clinical treatments using IOA or CPAP in the improvement of cognition, quality of life and cardiovascular parameters. In terms of cardiovascular conditions, several studies have evaluated the effect of treatment on blood pressure, heart rate and oxidative stress.

The clinical treatment of OSA using IOA and CPAP is unquestionably consistent according to the literature, whereas only a few studies have evaluated other treatments so far.

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