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The role of the orthodontist in OSAS treatment. A literature review

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Abstract

The objective of this study is to make a review of literature about OSAS analyzing the different therapeutic strategies used by the orthodontist to treat subjects suffering from this disorder. Obstructive sleep apnea syndrome (OSAS) is defined as recurrent episodes of obstruction of the upper airway. Loud snoring, tiredness during the day, cardiovascular and neurocognitive disease are typical aspects of a subject affected by OSAS. The etiology is multifactorial and the identification of the obstruction site is essential for the most appropriate therapy. The orthodontist can play a fundamental role in the diagnosis and treatment of some orthodontic alterations that contribute to the development of OSAS.

Introduction

Obstructive sleep apnea syndrome (OSAS) is considered a respiratory disorder characterized by episodes of partial or total airway obstruction that can determine physiologic disorders with different clinical manifestations (1). This syndrome affects an average 2% of adult famales and 4% of adult males in the population (2). OSAS represents a possible aspect of a more general condition known as Sleep disordered breathing (SDB) which comprise a wide variety of clinical cases with different severity. Neurophysiological alterations during sleep caused by changes in the muscle tone of pharyngeal walls and anatomic variations are the basis of the Sleep disordered breathing (3). Nasal obstruction, skeletal and soft tissue alterations, impaired neuromuscular system or obesity are all possible causes of SDB. OSAS represents the most severe form of SDB. It is Â associated with anomalies in blood-gas exchange and airâ€“flow reduction during sleep, hypopnea, or cessation, apnea, which make the sleep fragmented. OSAS can have significant impact on quality of life, patients affected by this disorder tipically reported headache at the morning, drowsiness during the day, lack of cognitive abilities that interfere with work and other activities.

Methods

Our review was carried out using electronic Pubmed database. We conducted the research thanks to specific keywords: OSAS (obstructive sleep apnea syndrome), orthodontic therapy of OSAS, mandibular advancement device for OSAS, oral appliance for OSAS treatment. We selected only articles published from 1999 to 2019.

Discussion

OSAS treatment strategies include a healthier lifestyle devoid of alcohol and drugs, weight loss diet if necessary, surgical modalities such as, uvulopalatopharyngoplasty, glossectomy and maxillomandibular advancement procedures (4). The most common therapeutic procedure for OSAS treatment is CPAP (continuous positive air way pressure) (5). Orthodontics is a simple, non-invasive, low-cost and relative comfort for patients therapeutic alternative (6).

Many studies have focused on the importance of the dentistâ€™s role in solving orthodontic alterations that can facilitate the development of this condition (7). Orthopedic expansion of the upper jaw in pediatric patients and mandibular advancement represent successful therapeutic modalities in the treatment of OSAS.

Several studies have analyzed the effectiveness of mandibular advancement devices (MADs) for treatment of obstructive sleep apnea syndrome. MADs can increase the upper airwayâ€™s size during sleep trough a mechanical effect. Teixeira et al. (8) compared the improvements achieved with a mandibular advancement device with those obtained by a placebo device. They found a reduction of apnea hypopnea index and apnea index only in patients treated with mandibular advanced device. Gasparini and other authors used a MAD for OSAS treatment which is a combination of Herbst appliance principles and splints of neuromuscular deprogramming of the â€œFedericiâ€• type used for gnathologic treatments (9). The results of their study have shown the effectiveness of this deviceÂ Â in improving the

polysomnographic and radiographic parameters. Lazard et al. evaluated the improvements obtained with the tongue retaining device in the treatment of OSAS (10). The results reported a significant reduction of the apnea-hypopnea index, the intensity of snoring and the Epworth sleepiness Scale in patients undergoing therapy with the tongue retaining.

Many orthodontists used rapid maxillary expansion (RME) during the dynamic phase of growth to treat OSAS in pediatric patients producing significant improvements. A meta-analysis of literature conducted by Almiro JosÃ¨ and others found that RME in children affected by OSAS is an effective strategy for this syndrome (11). The rapid maxillary expansion acts trough different mechanisms for improving of OSAS. This device reduces the nasal resistance improving the passage of air through the nose. Moreover the development of the maxillary dental arch obtained with RME improves the position of the tongue and enhances the oropharyngeal space.

Conclusion(s)

Subjects affected by OSAS, if left untreated, could experience numerous clinical complications, from deleterious effects on growth in pediatric patients, cognitive damage and behavioral alterations, to cardiovascular risk in adults. A multidisciplinary approach is essential to face the problem and in this context the professional figure of the orthodontist can either recognize conditions that require the evaluation of otolaryngoloy or contribute to the improvement of the pathologyÂ through mandibular advancement or orthopedic expansion of the upper jaw.

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