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Clinical features of the sleep bruxism and gastroesophageal reflux association deserve professional attention

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Resumo

Introdução: Bruxismo tem sido definido como uma atividade parafuncional oral que consiste em apertar e/ou ranger os dentes durante o sono ou na vigília. Além do bruxismo do sono (BS), outros movimentos orofaciais também podem, esporadicamente, ocorrer durante o sono. A regurgitação ocasional e a queimação no peito devido ao refluxo gastroesofágico (RGE) são freqüentes sintomas relatados pela população em geral. A RGE refere-se à presença de sinais e sintomas secundários, com ou sem sinais de lesões na mucosa do esôfago. Os dentistas são, muitas vezes, os profissionais da saúde que primeiro diagnosticam o RGE por meio da observação de suas manifestações orais. **Objetivo:** Assim, o objetivo do presente artigo foi discutir os procedimentos clínicos e diagnósticos em dois pacientes com BS e RGE, contribuindo assim para a difusão do conhecimento sobre a interação dessas duas entidades. Recomenda-se aos dentistas estarem atentos para identificar os primeiros sinais de RGE que se manifestam na cavidade oral. **Conclusão:** Neste ponto, destaca-se a importância de tratar o paciente como um todo, esforçando-se para identificar outras fontes de problema que poderiam atuar como fatores agravantes destas condições.

Palavras-chave: Bruxismo do sono; atividade rítmica dos músculos mastigatórios; refluxo gastroesofágico; desgaste dos dentes.

Abstract

Introduction: Bruxism has been defined as an oral parafunctional activity that includes clenching and/or grinding the teeth while asleep or awake. In addition to sleep bruxism (SB), various other orofacial movements sporadically occur during sleep. Occasional regurgitation and heartburn due to gastroesophageal reflux (GER) are frequent in the general population. GER refers to the presence of symptoms that are secondary to the reflux of gastric content through the esophagus with or without signs of esophageal mucosal lesions. Dentists are often the first health care professionals to diagnose GER through observation of its oral manifestation. **Objective:** The aim of the present case reports was to discuss the diagnosis and clinical procedures followed in two patients with SB and GER, thereby contributing to the dissemination of knowledge about these two entities. We therefore recommend dentists to be alert to identifying the first signs of GER that appear in the oral cavity. **Conclusion:** At this point, we highlight the importance of treating the patient as a whole, in an endeavor to identify other sources of the problems that could contribute as factors aggravating these conditions.

Keywords: Sleep bruxism; rhythmic masticatory muscle activity; gastroesophageal reflux; tooth wear.

INTRODUCTION

Bruxism has been defined as an oral parafunctional activity that includes clenching and/or grinding the teeth while asleep or awake. Patients suspected of having bruxism may present tooth wear or damage, fractured dental restorations, implant failures and reports of tooth hypersensitivity, masticatory muscle/joint discomfort and orofacial pain and/or headaches. In addition to sleep bruxism, various other orofacial movements sporadically occur during sleep, e.g., talking and coughing[1].

The jaw-muscle activity related to sleep bruxism (SB) is a rhythmic masticatory muscle activity (RMMA), defined as three or more repetitive jaw-muscle bursts. This activity is observed in nearly 60% of normal subjects during sleep, without tooth contacts. In SB patients, the tooth contacts that occurred during rhythmic muscular activity, which constitutes approximately 90% of SB episodes, were nearly three times more frequent and had 40% higher muscle burst amplitude than in normal subjects[2].

During sleep, RMMA is often associated with swallowing. Saliva swallowing, which considerably decreases during sleep, seems to occur in an attempt to neutralize the esophagus` acids when pH diminishes due to gastroesophageal reflux (GER). Most GER episodes, particularly those with lower pH, contained both an RMMA episode and a burst with duration of approximately 0.5 to 1.0 seconds, probably representing saliva swallowing[3].

Occasional regurgitation and heartburn due GER are frequent in the general population. GER refers to the presence of symptoms that are secondary to the reflux of gastric content through the esophagus with or without signs of esophageal mucosal lesions. In more severe manifestations, GER seems to be related to recurrent and long-lasting reflux episodes that occur even during sleep[4].

There is no single test that can consistently detect GER, however, depending on the clinical situation, reflux can be demonstrated by several diagnostic tests, such as barium esophagography, endoscopic examination, esophageal acid perfusion, measurement of lower esophageal sphincter pressure, mucosal biopsy, standard acid reflux test and radionuclide scintography[5].

Dentists are often the first health care professionals to diagnose systemic diseases through observation of their oral manifestations. One such condition is the gastroesophageal reflux disease (GER), which can be evidenced by dental erosions. Dental erosion is defined as the loss of tooth structure by a nonbacterial chemical process. It has been associated with the ingestion of acidic foods, bulimia, rumination and GER[5].

The mechanisms underlying tooth wear include attrition, erosion and abrasion and rarely operate singly. The overlaps of two or more mechanisms, often at different times, lead to the complexity of the wear phenomenon. Formerly, tooth wear was generally believed to be caused by attrition and abrasion. Today, dental erosion is widely considered a major cause of tooth wear. It has been suggested that modern man more often experiences 'bursts' of wear, coinciding with the presence of certain causative factors, such as intermittent periods of intensive bruxism frequent acid regurgitation or vomiting, frequent intake of acid drinks during childhood or adolescence, and/or chronic alcoholism that decreases pH and saliva levels of the oral environment facilitating the development of erosive lesion[6-9].

Erosion associated with GER are evident as concave depressions on the palatal and occlusal surfaces of maxillary teeth, as well as the buccal and occlusal surfaces of mandibular posterior teeth, and have been termed perimolysis or perimylolysis[10]. In the presence of an excessive tooth wear, the dentist must act protecting the teeth to prevent continue tooth wear and restoring them, when indicated. Furthermore, the patient should be referred to a gastroenterologist for a medical evaluation to verify the presence of GER[3]. Tooth wear is a multifactorial process which makes it difficult to identify a single cause[7].

Thus, the aim of the present report was to discuss the diagnosis and clinical procedures followed in patients with SB and GER, thereby contributing to the dissemination of knowledge about these two entities.

CASE REPORTS

1. *Case 1*

The patient C.A.P., an 18 year-old girl presenting aesthetic complaints in regards to maxillary and mandibular incisors. Clinical examination revealed excessive dental wear on the occlusal surfaces of posterior teeth (Figure 1a) and on the incisal surfaces of anterior teeth (Figure 1b), characteristic of attrition caused by teeth grinding, typical of sleep bruxism. Wear similar to erosion was also observed on the occlusal surfaces of mandibular posterior teeth (Figure 1c) and palatal surfaces of maxillary anterior teeth, suggesting gastroesophageal reflux. Sleep bruxism was confirmed by dental wear revealed after clinical examination, and by a roommate that heard the noise of grinding teeth. Since the occlusal surfaces of the posterior teeth presented severe erosion, the patient was referred to a gastroenterologist, who asked for an endoscopy examination. After the suspicion of GER was confirmed, the treatment was conducted by a specialist. In order to avoid further teeth damage resulting from sleep bruxism, the nocturnal use of a rigid acrylic maxillary occlusal splint was indicated. The occlusal splint used in this case was Michigan splint. This appliance had smooth occlusal surface with simultaneous bilateral contacts in the posterior teeth. Contacts in the anterior teeth lighter than in the posterior teeth, and side and protrusive guide (mutually protected occlusion). The splint occlusal was made immediately after restorative treatment and the patient was monitored for 1 month after the installation of the splint, since the patient had no TMD signs and symptoms.

2. *Case 2*

The patient M.A.I., a 37-year-old man, had presented facial pain for 18 months that was not associated with any physical trauma. He reported pain described as a sensation of weight-pressure-tightness, exacerbated by mastication, and occurring in crises that lasted for hours. Moreover, the patient reported that

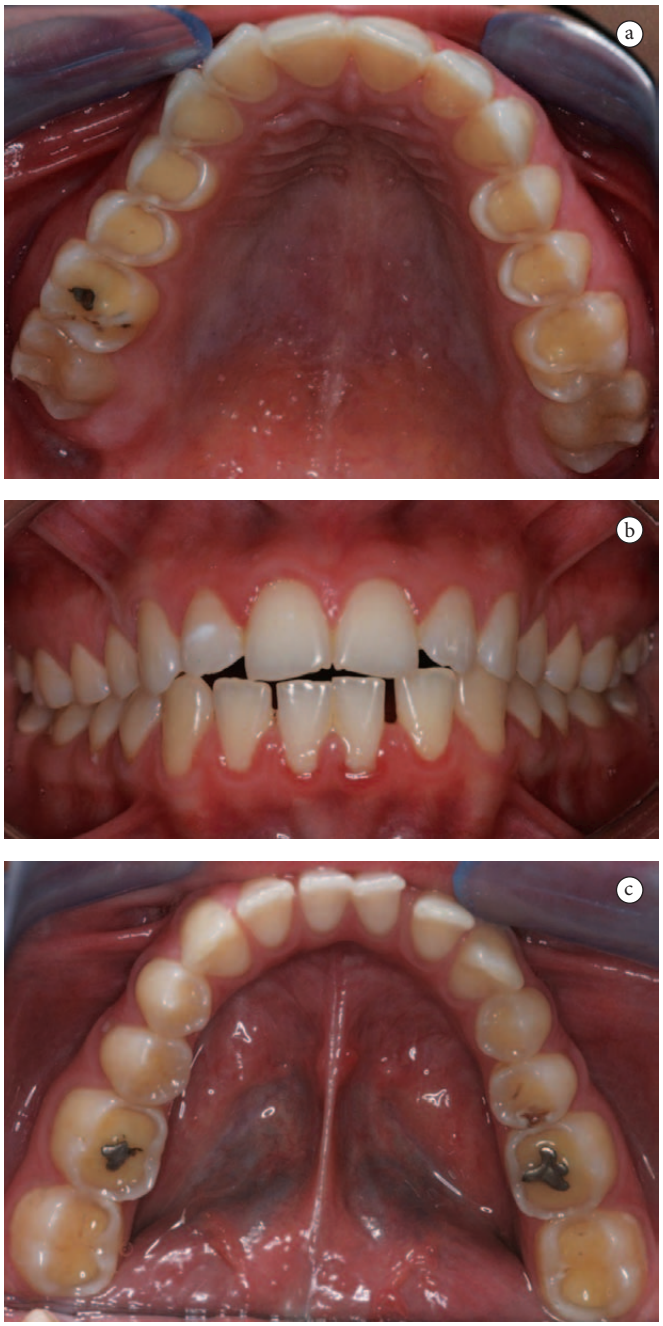

Figure 1. a) Excessive dental wear on the occlusal surfaces of posterior teeth. b) Excessive dental wear on the incisal surfaces of anterior teeth. c) Erosions observed on the occlusal surfaces of mandibular posterior teeth.

cold drinks and food evoked extreme sensitivity and dental pain in the anterior teeth. In order to reduce facial pain, the patient used pain killers and anti-inflammatory drugs without medical supervision. The patient also reported diurnal clenching of teeth and sleep bruxism, the latter confirmed by a roommate.

The clinical examination revealed severe and widespread teeth wear on maxillary teeth (Figure 2a) and mandibular teeth (Figure 2b); also, changes in the patient's vertical dimension of occlusion were verified (Figure 2c, d). The diagnosis of myofascial pain was confirmed by palpation of masticatory muscles. On suspicion of gastroesophageal reflux associated with the bruxism presented, the patient was referred to the gastroenterologist who confirmed the GER diagnosis. The GER was controlled by the medical specialist through pharmacotherapy. Myofascial pain was treated as recommended by the literature through conservative modalities[11]. In this specific case, aiming to reduce the patient's pain, the patient was informed of its condition and was given advice and self-care, fisiotherapy (Transcutaneous Electrical Stimulation – TENS and ultrasound) in the painful area, a centrally acting muscle relaxant, and an a rigid acrylic maxillary occlusal splint for nocturnal use, also with the objective of reducing the loss of the dental structure caused by sleep bruxism (the occlusal splints characteristics are the same as case 1). The self-control of daytime teeth clenching was also recommended. The patient was taken care of until the complete remission of TMD signs and symptoms.

DISCUSSION

Recent studies in adults have proposed an association between SB and GER, because nocturnal RMMA episodes frequently occur when esophageal pH is reduced[3,4]. It has been suggested that sleep bruxism may be secondary to nocturnal GER[3], whereas patients with GER often present excessive tooth wear, which is also a characteristic of sleep bruxism[12]. In patients with primary sleep bruxism, the association with GER may accentuate the activity of grinding and/or clenching turning it more severe.

In a double-blind, placebo-controlled clinical study, the first study revealed the relationship between RMMA and GER. They found that most GER episodes, particularly those with a lower pH, contained both an RMMA episode and an EMG burst with duration of approximately 0.5 to 1.0 seconds, probably representing saliva swallowing. Furthermore, RMMA episodes more frequently occurred during GER episodes than during other sleeping time, particularly when esophageal pH was less than 3.0 or 4.0. Moreover, the frequency of RMMA decreased significantly after the administration of a proton pump inhibitor, which increased the gastric and esophageal pH. With this medication, the mean rate of decrease in the frequency of bruxism episodes was approximately 40%[3]. More recently, it was demonstrated, in a randomized trial study, that RMMA episodes including SB were induced by esophageal acidification[13].

In summary, the relationship between SB and GER has not yet been elucidated, it has been suggested that with the increase in the gastric and esophageal pH during the night leads to an increase in RMMA[3,13]. A putative function of RMMA during sleep is the increasing of salivary flow to lubricate the mouth[14], maintaining patency of the upper airways[12], function that may be impaired due to GER episodes. As a result, it is possible that the excessive RMMA and consequently an increase in the sleep bruxism severity or the beginning of a secondary sleep bruxism, can lead not only to excessive teeth wear but also, it may contribute to lead temporomandibular disorders (TMD) in patients with a predisposition, since SB may be considered a risk factor for TMD[15-17].

Figure 2. a) Severe and widespread tooth wear on maxillary teeth. b) Severe and widespread tooth wear on mandibular teeth. c) Changes in the patient's vertical dimension – teeth in occlusion. d) Changes in the patient's vertical dimension – generalized teeth damage.

This topic is important since recent researches have shown that adults with GER disease also have a higher incidence of TMD disorders, in particular masticatory muscle pain[18]. This is illustrated in case 2 that the severe bruxism associated with GER is not the factor causal for patient´s TMD, but may be an associated factor.

Therefore, it is utmost important that the dentist mistrusts the initial GER diagnosis and then forward it to the specialist for the final diagnosis. Thus, the professional will be contributing to the patient's general health as well as avoiding excessive dental wear and a possible TMD episode in patients with a predisposition.

CONCLUSION

Through case reports and a literature review, it can be suggested that there is a possible association between GER and sleep bruxism. However, no relationship of cause and effect has been established between them and there is a need for further studies on the subject. Finally, we make an important recommendation for dentists to be alert on identifying the first signs of GER that appear in the oral cavity. At this point, we highlight the importance of treating the patient as a whole, in an endeavor to identify other sources of the problems that could contribute as aggravating factors for these conditions.

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