

A CASE OF SLEEP APNOEA PRESENTING AS SLEEP BRUXISM SHOWING EARLY SIGNS OF METABOLIC SYNDROME – A CASE REPORT

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ABSTRACT

Aim and background: This case report describes presentation of a case of sleep bruxism in which the underlying pathology was discovered to be sleep apnoea. Teeth grinding is usually treated by dental appliance, but in this case the appliance had no effect. **Case description:** The pathophysiology of sleep bruxism was found to be sleep apnoea. Judicious history taking and integrative approach to find out the etiology, resulted in formulating a diagnosis of generalized muscle weakness, recent weight gain and sedentary lifestyle. The lipid profile presented a picture of cardiovascular risk and indicated metabolic syndrome risk factors. Advice for weight loss and exercise therapy was given for which patient compliance was excellent. Both sleep bruxism and sleep apnoea showed improvement and muscle weakness and cardiovascular risk decreased. Hence, serious complications of sleep apnoea were avoided. **Conclusion:** Dental diseases like sleep bruxism may indicate serious systemic problems and must be investigated thoroughly. **Clinical significance:** This case report is aimed at heightening awareness of both physicians and dental surgeons to early onset of metabolic syndrome and/or sleep apnoea which may present as dental disease.

KEYWORDS: Sleep bruxism, sleep apnoea, metabolic syndrome, polysomnography, cardiovascular risk.

INTRODUCTION

Glossary of Prosthodontic Terms (GPT-8) defines bruxism as parafunctional grinding of teeth or an oral habit consisting of involuntary rhythmic or spasmodic non functional gnashing, grinding or clenching of teeth in other than chewing movements of the mandible which may lead to occlusal trauma. Bruxism can occur during wakefulness or during sleep. Bruxism during daytime is commonly a semivoluntary ‘clenching’ activity and is also known as ‘Awake Bruxism’ (AB) or Diurnal Bruxism (DB). AB can be associated with life stress caused by familial responsibility or work pressure. Bruxism during sleep either during daytime or during night is termed as ‘Sleep Bruxism’ (SB)^[1]. It (Sleep apnoea) is characterized by airflow cessation due to the collapsing of the upper airways in the setting of a continued respiratory effort, leading to arterial oxygen desaturation, frequently terminated by arousal.^[2]

Sleep bruxism (SB) is a masticatory muscle activity during sleep that commonly co-occurs with OSA.^[3]

Metabolic syndrome is an accumulation of several disorders, which together raise the risk of an individual developing atherosclerotic cardiovascular disease, insulin resistance, and diabetes mellitus, and vascular and neurological complications such as a cerebrovascular accident. Metabolic disarrangement becomes a syndrome if the patient has any three of the following:

Waist circumference more than 40 inches in men and 35 inches in women

Elevated triglycerides 150 milligrams per deciliter of blood (mg/dL) or greater

Reduced high-density lipoprotein cholesterol (HDL) less than 40 mg/dL in men or less than 50 mg/dL in women

Elevated fasting glucose of 100 mg/dL or greater

Blood pressure values of systolic 130 mmHg or higher and/or diastolic 85 mmHg or higher.^[4]

Case description: The case was a fifty year old female patient weight 70 kg height 160 cm, BMI was 27.7; waist circumference 37 inches. The patient presented with complaint of teeth grinding and exhibited all the symptoms and signs of the disorder. She complained of sore muscles in the jaw and face, especially on waking up, and increased tooth sensitivity. She also complained of being breathless and waking up with palpitations. She was not menopausal.

Physical examination results of oral cavity included, wear on her teeth, abfractions, and recession of gums with presence of a small papule on right cheek. She was examined and prescribed a dental appliance.

On follow up she reported that her symptoms were worse. Her appliance was re-examined and adjusted. But she didn't respond to it at all. This is an anomaly and points to the etiology of sleep bruxism. In case, the sleep bruxism is associated with or caused by sleep apnoea, it is seen that wearing a mouth guard to protect teeth from grinding may make the patient grind the teeth even more. This is because a mouth guard repositions the jaw so that the airway blockage is more than without the mouth guard. So, the patient was referred to ENT dept. for suspected sleep apnoea. She was also advised follow-up for gum recession as mouth breathing is one of the causes for gum recession.

Investigations included routine blood tests. She got polysomnography done, which reported mainly the findings of obstructive sleep apnoea. The following parameters were monitored frontal, central and occipital EEG, electrooculogram EOG, submental EMG, nasal and oral airflow and ECG. Additionally, thoracic and abdominal movements were recorded by inductance plethysmography. Oxygen saturation (SpO₂) was monitored using a pulse oximeter. 38 snoring episodes were reported. Number of episodes and % of Total sleep time respectively for central apnoea (CA) was 6 and 0.4% and for obstructive sleep apnoea (OA) was 52 and 3.7%.

Although her blood glucose was within normal range, her HbA1c was borderline 5.6% (normal range 4.00 - 5.60) More of concern was her HDL cholesterol being 45 mg/dl (normal >50) and LDL 126.32 mg/dl (normal value <100)

She was advised weight loss and regular physical activity and follow up for evaluation of sleep apnoea. On careful history, it was found she had decreased physical activity since 3-4 years and also weight gain upto 5-6 kg in last year. Her weight was 70.2 kg and BMI 27.7. She was referred to a dietician and advised to exercise regularly, as exercise helps in gum healing and muscle tension decreases with exercise which might help in bruxism. She was advised to sleep on her side to prevent obstruction to the respiratory tract.

Advice on the proper position of tongue: It is seen most people are suffering from abnormal position of tongue as more use of cell phones means more talking and even in sleep tongue is placed in a lower position near the floor of the mouth as in talking. This disrupts breathing as muscles become lax. The patient was advised in dental department for proper position of tongue and teeth. It should be under roof of mouth with teeth apart. Patient was advised good dental hygiene again as her gums appeared healthier and advised for follow-up after 3 months.

At follow up at 3 and later at 6 months the advice for proper position and dental hygiene was repeated. She had lost weight being on strict dietary advice and practiced increased daily activity regularly by taking a walk and other exercises. She was advised resistance training exercises to further increase muscle tone and followed them as well. Eventually, she reported that her sleep apnoea had disappeared. She also reported no further episodes of teeth grinding as her symptoms of headache and aching teeth on waking up had disappeared. On examination, she was found to have good recovery from gum disease and the papule inside her cheek was also reduced in size. Her weight was 62.3kg and BMI in the normal range, the value being 24.6.

Thus, a radical improvement in bruxism and sleep apnoea occurred with insightful treatment and the correct positioning of tongue. She refused repeat polysomnography as she had no more symptoms. Her family concurred she had no more teeth grinding during sleep. She reported no waking episodes and seemed more active and alert. She also reported she had resumed several hobbies she had not been able to take part in before and had improved day time alertness and energy levels. Her lipid profile and HbA1c also normalized.

DISCUSSION

It is helpful to consider here how sleep bruxism ties up with sleep apnoea of the obstructive type. The brain needs to open the airway and get the muscles of mastication to start working hard and fast, a process we know as bruxism. The masticatory muscles move the jaw forward, the airway opens, and the patient takes in a deep rescue breath. The patient falls back asleep, the airway gets blocked, and the process repeats many times during the night. This is known in evidence-based studies as sleep bruxism.

Neither occlusal stabilization splints nor palatal splints had an influence on the SB outcome variables or on the sleep variables measured on a group level. Our case showed similar findings. Sleep bruxism did not improve with dental appliance.^[5]

Obstructive sleep apnea (OSA) is characterized by repetitive episodes of upper airway obstruction caused by a loss of upper airway dilator muscle tone during sleep and an inadequate compensatory response by these

muscles in the context of an anatomically compromised airway. The genioglossus (GG) is the main upper airway dilator muscle. Currently, continuous positive airway pressure is the first-line treatment for OSA. Nevertheless, problems related to poor adherence have been described in some groups of patients. In recent years, new OSA treatment strategies have been developed to improve GG function.^[6]

This case report adds weight to the hypothesis that improving the tone and strength of pharyngeal muscles reduces the severity, frequency and loudness of snoring, and improves mild to moderate sleep apnoea.^[7]

Hence, the mandatory physical exercise regime. As the patient compliance for physical activity was high, we could see the improvement in the sleep apnoea as the tone of all muscles increased and the obstructive etiology reduced.

CONCLUSION

Sleep apnoea is common problem especially for the middle-aged. It leads to many complications, some even life threatening. Teeth grinding has also some prevalence. Knowledge of the association of the two conditions can lead to detection and increased resolution for a number of cases. If we know, sleep bruxism is related to sleep apnoea and even caused by it, unnecessary use of appliances is avoided. In fact, if the provision of appliance worsens the condition, the dentist must be vigilant and segregate sleep apnoea cases from other causes of bruxism.

Clinicians should take into account the increased risk of SB in patients with mild and moderate OSA, and these patients should receive the care of both a sleep specialist and a dentist.^[8]

Clinical significance

Thus, it is helpful to consider this link between sleep bruxism, sleep apnoea and early signs of metabolic syndrome as it may present not only a breakthrough in approach to bruxism, but also lead to avoidance of the preventable complications caused by sleep apnoea.

Thorough investigation and history taking of bruxism deliberately focusing on presence of signs and symptoms related to sleep apnoea, level of activity and recent or overt weight gain is suggested in every patient.

List of abbreviations: BMI – Body Mass Index, OSA – obstructive sleep apnoea.

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