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RESEARCH ARTICLE

KNOWLEDGE, AWARENESS AND PRACTICE AMONG DENTAL PRACTITIONERS REGARDING ORAL APPLIANCES IN TREATMENT OF OBSTRUCTIVE SLEEP APNEA

***Janhvi Manohar**

Saveetha Dental College, India

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ABSTRACT

Aim: To assess the knowledge, awareness and practice among dental practitioners regarding oral appliances in treatment of obstructive sleep apnea (OSA).
Objective: The objective of this study is to analyse the knowledge, attitude, perception and practice among dentists in the city of Chennai regarding oral appliances in treatment of OSA and thus create awareness to ensure it's early screening and proper treatment.
Background: Obstructive sleep apnea (OSA) constitutes a major public health problem that affects the middle-aged population. The problems of snoring and obstructive sleep apnoea have received considerably increased public attention during the past10-15 years. Oral appliances are devices that can be used to treat mild or moderate Obstructive Sleep Apnea, as well as snoring. Oral appliances are known as: Mandibular Advancement Splints (MAS), Mandibular Advancement Devices (MAD), Mandibular Repositioning Appliances (MRA), or Tongue Retaining Devices (TRD) which hold your tongue in place to keep your airway open while asleep. This study aims to assess the knowledge and analyse the practice of dentists regarding OSA and its management.
Reason: Management of OSA should be given more importance in the student's curriculum as dentists often fail to recognise OSA as being related to dentistry and thus co-operating with physicians while treating OSA.

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INTRODUCTION

Obstructive sleep apnea (OSA) is a prevalent disorder, particularly among the middle-aged (Young *et al.,* 1993). It is marked by recurring or complete occlusion of the upper airway during sleep, resulting in oxyhemoglobin desaturation and arousal (Gotsopoulos *et al.,* 2002). There is now a considerable body of literature documenting the pathophysiology and consequences of more severe OSA; however, the morbidity, benefits of treatment, and optimal mode of management of mild to moderate OSA remain a clinical dilemma (Barnes *et al.,* 2004). It is a common disorder that affects 2% of women and 4% of men among the adult population. The treatment of OSA depends on the severity of symptoms, magnitude of clinical complications, and etiology ofupper airway obstruction (Ferguson *et al.,* 1996). Treatment of sleep-disordered breathing (i.e. snoring, upper airway resistance syndrome, sleep apnea syndrome) can be divided into four general categories. These include: (1) lifestyle modification, i.e. weight loss, cessation of evening alcohol ingestion, sleep position training, (2) upper airway surgery, (3) oral appliances, and (4) CPAP. Although the latter category provides the most reliable therapeutic modality and is the most widely used method to treat sleep disordered breathing today it is also the most cumbersome one. Many patients, particularly young non-apneic snorers, find it unappealing, difficult to tolerate, and unacceptable. The only other non-invasive alternative, which can produce favorable results within a short time, is oral appliances (Hoffstein, 2007). Dentistry was pivotal in the earliest elucidation of sleep apnea. In 1932 the well-known French dental surgeon, Pierre Robin, described a breathing impairment during sleep caused by pharyngeal obstruction in children with micrognathia and glossoptosis (Robin, 1923). He initially described a device called the "monoblock", for the treatment of glossoptosis. More than 30 years later, he used an oral appliance to reposition the mandible (Robin, 1934). The need for convenient methods of treating sleep apnea has stimulated advances in dental sleep science. The rather barbaric features of standard medical therapy, continuous positive airway pressure (CPAP), spurred dentists to invent dental appliances that might relieve pharyngeal obstruction during sleep by protruding the mandible (Rogers *et al.,* 2016). However, in 1903, micrognathic infants benefitted when the tongue was sutured forward to the lower lip and helmets and chinstraps were used to reposition the mandible forward by the year 1930. For the next 50 years, little work was done in this field.

****Corresponding author: Janhvi Manohar***
Saveetha Dental College, India.

It took almost another 50 years to start using oral appliances for the treatment of snoring and sleep apnea when Cartwright and Samelson (Cartwright and Samelson, 1982) described the tongue retaining device in 1982. Based on the mode of action, oral appliances may be roughly divided into Tongue-retaining Appliances and Mandibular Repositioning Appliances. Oral appliances are a relatively recent development and act to position the mandible in a protruded position during sleep (Barnes *et al.,* 2004). The mode of action is unclear but is probably multifactorial, involving both a structural change with enhancement of the caliber of the airway and triggering of stretch receptors, which activate the airway support muscles (Ng *et al.,* 2003). Undiagnosed OSA can contribute to hypertension, cardiovascular disease, stroke, and detract from overall quality of life. Dentists can play an important role in detecting, making recommendations for, and treating OSA with oral appliances (Bian, 2004). Unarguably, the knowledge aboutoral appliances among dentists and physicians varies geographically, being higher in large urban centers, which provide more educational opportunities locally (Hoffstein, 2007). This study aims to summarize the current state of knowledge, attitude, awareness and practice of oral appliances among dental practitioners for the treatment of snoring and obstructive sleep apnea. However, the main objective of this study is to create awareness among practitioners about sleep apnea and oral appliances for its treatment.

MATERIALS AND METHODS

A questionnaire based study was conducted among 100 dental practitioners in the city of Chennai, India. The sampling frame comprised BDS and MDS dental practitioners. The subjects were administered with a structured questionnaire consisting of questions on their knowledge, practice and awareness of oral appliances used for the treatment of obstructive sleep apnea to obtain a general information on their attitude to the provision of oral appliances. The questionnaire was created by using a survey-tool app, Survey Planet (https://app.surveyplanet. com/#) and was distributed among the dental practitioners.

RESULTS

A total of 100 dental practitioners participated in this cross-sectional study which was sufficient to give an indication of the current knowledge and practice of oral appliances among dental practitioners. Dental practitioners from each specialty were administered with the questionnaire including general dentists and pedodontists, as even children are affected by sleep disorders.

Knowledge

A total of 4 questions were asked which addressed the knowledge of the dental practitioners. About 32% of the subjects did not know the gender being most susceptible to OSA. In all, 88% could recognize the definition of OSA. Only 27.6% identified all the mechanisms by the oral appliances work. When asked about the tests carried out to screen for OSA, 21.15% could not identify them whereas more than 50% of the dental practitioners were partially knowledgeable about the tests. However, less than 20% identified the occlusion criteria for mandibular advancement appliances.

1) **Area of specialty:**

2) **Are you aware of the term, SLEEP APNEA, complete or partial occlusion of upper airway during sleep?**
   - YES
   - NO

3) **How often have you come across a patient with obstructive sleep apnea (OSA)?**
   - Frequently
   - Occasionally
   - Never

4) **What would you offer a patient with sleep apnea?**
   - Lifestyle modification
   - Provide an oral appliance
   - Refer to a physician
   - Suggest Continuous Positive Airway Pressure (CPAP)

5) **Are you aware of the three general groups of sleep appliances; soft palate lifters, tongue retaining devices and mandible advancement appliances?**
   - Yes
   - No

6) **Are you aware about the most common sites of obstruction in OSA being retroglossal and retropalatal regions?**
   - Yes
   - No

7) **Among the patients diagnosed with OSA, which gender has the highest prevalence?**
   - Males
   - Females

8) **Which of the following test/tests are carried out to screen for OSA?**
   - Polysomnography
   - Home sleep apnea testing
   - Epworth Sleepiness Scale
   - All the above

9) **Have you come across the topic of management of sleep apnea and oral appliances in your curriculum?**
   - Yes
   - No

10) **Are you aware that oral appliances are unlikely to work for patients with central sleep apnea?**
- Yes
- No

11) **Are you aware of the side-effects of oral appliances being TMJ pain, masseter pain, etc.**
- Yes
- No

12) **Are you aware that untreated sleep apnea can cause heart attacks, obesity, diabetes, etc.?**
   - Yes
   - No

13) **What is the mechanism by which oral appliances work?**
- Positioning the mandible in a protruded position during sleep
- Enhancement of caliber of airway
- Triggering stretch receptors thus activating airway muscles
- All the above.

14) **Are you aware that Mandibular Advancement Appliances (MAA) produce anatomical changes that may prevent or worsen the obstruction due to OSA?**
- Yes
- No

15) **According to you, what are the occlusion criteria for MAA?**
   - Extensive periodontal disease
   - Insufficient number of teeth
   - TMJ disorders
   - All the above

16) **Are you aware of the "Monobloc" described by French dentist Pierre Robin for treatment of glossoptosis which led to the invention of oral appliances?**
- Yes
- No

Awareness

Regarding awareness about OSA and oral appliances used for its treatment, 60% weren't aware of the three general groups of sleep appliances. When questioned about their awareness of the side-effects of oral appliances, 91.7% recognized all the side-effects. Table 1 shows the level of awareness among the subjects when OSA and oral appliances.

Table 1. Are you aware of the "Monobloc" described by French dentist Pierre Robin for treatment of glossoptosis which led to the invention of oral appliances?

Yes	77.3%
No	22.7%
Are you aware about the most common sites of obstruction in OSA being retroglossal and retropalatal regions?	
Yes	79.2%
No	20.8%
Are you aware that oral appliances are unlikely to work for patients with central sleep apnea?	
Yes	32%
No	68%
Are you aware that untreated sleep apnea can cause heart attacks, obesity, diabetes, etc.?	
Yes	88%
No	12%

Practice

Clinical experience of the subjects regarding diagnosing OSA and providing treatment provision were assessed and more than 50% of them haven't come across a patient with OSA whereas only about 4% have diagnosed a patient with it. When asked about the treatment plan they would offer to a patient with OSA, a good 37% claimed to provide an appliance whereas 29.6% of the subjects chose the option of referring the patient to a physician and 11.1% recognized Continuous Positive Airway Pressure (CPAP) as a treatment plan. 62.5% of dental practitioners claimed that the topic of management of sleep apnea and oral appliances was not included in their curriculum and thus they were self-taught on this topic. Other sources of information about OSA and oral appliances included publications, seminars, media and even this survey.

DISCUSSION

Of all dentists, general practice dentists more likely become the first-of-contact, detect potential OSA or other sleep disorders, refer these patients to primary care physicians or sleep specialists, or treat these patients with OAs (Bailey, 2001). Thus, their knowledge, awareness and clinical experience is essential to manage OSA patients. This study provided information about the status of management of OSA and its treatment. Previous researchers overemphasized dentists' role in treating OSA and overlooked the dentists' role in detecting or recognizing OSA and making proper recommendations or referrals. Nearly all practitioners in dentistry, regardless of their focus, can detect and manage potential OSA patients (Bailey, 2001). In this study, 52% of the dentists claimed to have never come across an OSA patient whereas only 4% had "frequently" seen or diagnosed a patient with OSA. This result gives an insight into both the patients and the dental practitioners. Patients of dentists, however, rarely complain of obstructive sleep apnoea or socially disruptive snoring, probably because they donot think that this is within the scope of practise of a dentist. Dentists, therefore, are not so aware of the problem (Jauhar *et al.,* 2008). In addition to this, when some of the subjects did come across a patient with OSA, 11.1% opted suggesting CPAP for treatment which tells us that only a small number of subjects were aware of this treatment modality. CPAP is preferred as primary treatment by physicians as it is most efficient in reducing the apnea-hypopnea index even though current literature increasingly supports mandibular advancement appliances as an effective alternative except for extremely and morbidly obese patients (Almeida, 2013). Supporting Almeida's statement, a good 37% chose to provide an appliance to an OSA patient. The topic of OSA and oral appliances has not been given much importance in their curriculum according to more than 60% of the subjects whereas 37.5% of them claimed otherwise. These two results correlate as the same percentage of the dental practitioners who had some theoretical knowledge about oral appliances seemed to have applied that in their practice. It was encouraging to know that 22.3% of the dentists suggested a lifestyle modification to their patients diagnosed with OSA. Dental practitioners also reported a high level of knowledge for questions like the definition of sleep apnea, it's side-effects and the history of "Monobloc" which eventually led to the invention of oral appliances. This result was expected as the subjects might have come across such information in their curriculum, media, seminars etc.

Only 27.6% of the subjects recognized all the factors and the mechanism of action by which oral appliances work, which emphasizes a need to give more importance to OSA and its treatment in undergraduate level as it is a far more prevalent disease than generally believed. The global prevalence varies from 0.3 % to 5.1% in general population (Young *et al.,* 2002) and 4.4% to 13.7% in India alone (Sharma and Ahluwalia, 2010). Speaking about prevalence, when asked about the gender having the highest prevalence of OSA, majority identified males as being more prone to OSA. This too was an obvious outcome as one of the major symptoms of OSA being loud snoring is observed more in males than females. This is attributed to gender differences in airway morphology (*e.g.*, fat distribution and craniofacial dimension) and protective effects of female hormones on upper-airway patency (Manber and Armitage, 1999). As the subjects were drawn from one state, results cannot be generalized to other populations. Subsequent studies should focus on the clinical patterns of practice among general practice dentists and predisposing, reinforcing, and enabling factors that influence them to recognize, make recommendations, and treat potential OSA patients (Bian, 2004). Thus, the problem of OSA requires more attention, validation and awareness must be created among dental practitioners, physicians and patients.

Conclusion

The dental practitioners who participated in this study, over-all had theoretical knowledge about OSA but not so much about its treatment by oral appliances. This reflected in their clinical practice as many lacked the ability to detect and manage OSA patients with oral appliances. Their training was deficient and thus it raises a red flag as untreated OSA patients often suffer from heart-attacks and obesity. Medical and dental communities face many hurdles concerning the development of early screening and proper treatment. It is a well-known fact that effects of OSA is extensive and early detection of the same will be beneficial to patients. It will also be cost effective public health measure to reduce mortality and morbidity. In conclusion, dentists need further training in the provision of these appliances, in the use of appropriate screening tests and the possibleside-effects of wearing appliances (Jauhar *et al.,* 2008). This can be done by conducting seminars regularly to create awareness and spread information about oral appliances and its steady developments. Management of OSA should be given more importance in the student's curriculum as dentists often fail to recognise OSA as being related to dentistry and thus co-operating with physicians while treating OSA.

REFERENCES

Almeida, F.R. 2013. Long-term effectiveness of oral appliance versus CPAP therapy and the emerging importance of understanding patient preferences. Sleep, 36(9): 1271-1272

Bailey, D. R., Attanasio, R. 2001. Dentistry's role in the management of sleep disorders. *Dent Clin North Am.,* 45 619-630

Barnes, McEvoy, Banks, *et al.* 2004. Efficacy of Positive Airway Pressure and Oral Appliance in Mild to Moderate Obstructive Sleep Apnea. *Am J Respir Crit Care Med.,* Vol 170. pp 656–664.

Bian, 2004. Knowledge, Opinions and Clinical Experience of General Practice Dentists toward Obstructive Sleep Apnea and Oral appliances. Sleep and Breathing, 8, no.2, 85-90

Cartwright, R.D., Samelson, C.F. 1982. The effects of a nonsurgical treatment for obstructive sleep apnea. The tongue-retaining device. *JAMA,* 248:705–709.

Ferguson, K. A., Ono, T., Lowe, A. A., Keenan, S. P., & Fleetham, J. A. (1996). A Randomized Crossover Study of an Oral Appliance vs Nasal-Continuous Positive Airway Pressure in the Treatment of Mild-Moderate Obstructive Sleep Apnea. Chest, 109(5), 1269-1275.

Gotsopoulos, H., C. Chen, J. Qian, A. Cistulli, 2002. Oral Appliance Therapy Improves Symptoms in Obstructive Sleep Apnea, A Randomized, Controlled Trial, *Am J Respir Crit Care Med*., Vol 166. pp 743–748.

Hoffstein, V. 2007. Review of oral appliances for treatment of sleep-disordered breathing. Sleep Breath, 11:1 – 22.

Jauhar, S., M. F. Lyons, S. W. Banham, R. Orchardson, 2008. The attitudes of general dental practitioners and medicalspecialists to the provision ofintra-oral appliances for themanagement of snoring andsleep apnoea. *British Dental Journal,* Vol 205. pp 653-657.

Manber, R., Armitage, R. 1999. Sex, steroids, and sleep: a review. *Sleep* 22:540-555.

Ng, A.T., Gotsopoulos, H., Qian, J., Cistulli, P.A. 2003. Effect of oral appliance therapy on upper airway collapsibility in obstructive sleep apnea. *AmJ Respir Crit Care Med.,* 168:238–241.

Robin, P. 1934. Glossoptosis due to atresia and hypotrophy of the mandible. *Am J Dis Child*., 48:541–547

Robin, P., author. 1923. Relapse of the base of tongue considered as a new cause of nasopharyngeal respiratory problems. Bulletin of the Academy of Medicine.

Rogers, R., J. Remmers, A. Lowe, A. Cistulli, J. Pinsell, D. Pantino, 2016. History of Dental Sleep Medicine. *Journal of Dental Sleep Medicine,* Vol 03.

Sharma, S.K., Ahluwalia, G. 2010. Epidemiology of adult obstructive sleep apnea syndrome in India. *Indian J Med Res.,* 131: 171-5.

Young, T., Palta, M., Dempsey, J., Skatrud, J., Weber, S., Badr, S. 1993. The occurrence of sleep-disordered breathing among middle-aged adults. *N Engl J Med.,* 328:1230–1235.

Young, T., Peppard, P.E., Gottlieb, D.J. 2002. Epidemiology of obstructive sleep apnea: a population health perspective. *Am J Respir Crit Care Med.,* 165:1217-39.

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