

# Evaluation of awareness of issues regarding obstructive sleep apnea and the orthodontist role in management: A survey among dental and medical practitioners

*Sri Meenakshi R. B, Senthil Kumar K. P, Prabhakar K*

Department of Orthodontics and Dentofacial Orthopedics, K.S.R. Institute of Dental Science and Research, Tiruchengode, Tamil Nadu, India

## ABSTRACT

**Introduction:** Underdiagnosed obstructive sleep apnea (OBSA) – hypopnea is a major public health burden. If left untreated, OBSA syndrome greatly shortens the expected life span of an individual due to its associated comorbidities, such as increased rates of cardiovascular and pulmonary diseases and obesity-related diabetes mellitus. **Objective:** The objective of this study was to assess the role of dentists and medical practitioners in diagnosis, management of OBSA, and their cross-reference to orthodontist in oral appliance therapy or surgical maxillomandibular advancement treatment for OBSA. **Materials and Methods:** Two standardized questionnaires, one each for medical and dental practitioners, were used in the study. **Results:** All practitioners (100%) strongly agree that OBSA in any form is to be treated. About 92.6% of orthodontists say that no medical practitioner had referred any patient for malocclusion correction. Adenotonsillar hypertrophy is the most common orofacial finding made them suspect OBSA. About 62% of dental practitioners and 96% of medical practitioners were not aware of oral appliance therapy for the management of OBSA. The references by a medical practitioner or other specialty dentist to an orthodontist for surgical maxillomandibular advancement or oral appliance therapy are very low (1.2%). **Conclusion:** Awareness regarding diagnostic options, management, and consequences of untreated OBSA remains inadequate among the practitioners who can contribute to the management of OBSA. The cross-reference to orthodontist for the management of OBSA is rare.

**Key words:** Medical practitioners, obstructive sleep apnea, orthodontist role

### Address for correspondence:

Dr. R. B. Sri Meenakshi,  
Department of Orthodontics and Dentofacial Orthopedics,  
K.S.R. Institute of Dental Science and Research, Tiruchengode,  
Tamil Nadu, India.  
E-Mail: rbsrimeenakshi@gmail.com

## INTRODUCTION

Obstructive sleep apnea (OBSA) is characterized by frequent episodes of upper airway collapse during sleep,

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

**For reprints contact:** reprints@medknow.com

**How to cite this article:** Sri Meenakshi RB, Senthil Kumar KP, Prabhakar K. Evaluation of awareness of issues regarding obstructive sleep apnea and the orthodontist role in management: A survey among dental and medical practitioners. J Indian Acad Dent Spec Res 2016;3:43-6.

Access this article online	
Quick Response Code:	Website: www.jiadsr.org
	DOI: 10.4103/jiadsr.jiadsr_5_17

causing recurrent arousals, intermittent hypoxemia, sleep fragmentation, and poor sleep quality.<sup>[1,2]</sup> The common clinical presenting symptoms are heavy snoring, witnessed apneas, and daytime hypersomnolence. It is a multifactorial disease. In India, OBSA is underdiagnosed and undertreated.<sup>[3]</sup> We lack in epidemiological data, and our health-care framework is not efficient as developed nations. Dental practitioners can play a significant role in the treatment of OBSA syndrome<sup>[4,5,6]</sup> as modern imaging techniques of the airway have great promise to more clearly define this disease process and the possible effect of maxillomandibular advancement on this condition. Hence, an overview of issues related to OBSA is questioned to dental and medical practitioners to identify their role in diagnosis and management and also to find the cross-reference among orthodontist and referring medical practitioners.

## MATERIALS AND METHODS

Two standardized questionnaires were prepared for the medical and the dental practitioners and the questionnaires were distributed through weblinks [Table 1] and also responses were gathered in person. Before the survey, the questionnaire was pretested and revised and issued to 350 medical and 350 dental practitioners. Data were analyzed using SPSS, and the questionnaire included issues regarding the history taking, Epworth sleep scale, most common orofacial finding of OBSA, anthropomorphic recordings, morphometric dental model prediction, awareness of dental orthotics as management to OBSA, maxillomandibular advancement surgery, polysomnography test, and also about reference among dental and medical practitioners and their knowledge about the orthodontist role in management.

## RESULTS

Out of 350 dental practitioners, 95 (27.14%) responded which include 36% of orthodontists, 52% of other specialty dentists, and 12% of general dentists, and out of 350 medical practitioners, 91 (26%) responded which include 89% of specialty practitioners, especially dealing with airway problems such as pulmonologists, ear, nose, and throat surgeons and pediatricians, and internal medicine practitioners and 11% of general medical practitioners. An inclusion criterion regarding their clinical experience is minimum 1 year of practice. The results show that 90% of both medical and dental practitioners were not asking for the history of snoring or daytime sleepiness or mouth breathing to their patients. 81% of dental and 53.9% of medical practitioners have no idea regarding Epworth sleep

scale, and the majority of the practitioners were not recording the anthropometric recordings of the patient. The results of the commonest orofacial finding made to suspect obstructive sleep apnea is given in Figure 1.

Regarding the mandibular advancement appliance for OBSA, 52% of dental practitioners had no idea and 98% of medical practitioners say they were not aware of oral appliance for the OBSA, and the reference by a medical practitioner to an orthodontist for surgical maxillomandibular advancement or oral appliance therapy is very low (1.2%).

## DISCUSSION

OBSA is a potentially life-threatening disorder characterized by repeated collapse of the upper airway during sleep with periodic cessation of breathing (for more than 10 s). These events usually result in fragmented sleep. Sleep ranks the three most important considerations in maintaining good health, so the presence of fragmented sleep has a negative effect on patients' overall health. A study of the American adult society showed the OBSA syndrome prevalence of 2%–4% in two decades ago; however, its outbreak is increasing internationally along with obesity and aging, and in some Asian countries, it affects 7.5%–27% of adult population.<sup>[7,8]</sup> The etiology is multifactorial, genetic, and endocrine factors have been linked to OBSA. Gross anatomic factors such as mandibular malformation, micrognathia, tonsillar and adenoidal hypertrophy, and nasal septal deviation play a major contributory role.<sup>[9]</sup> OBSA is an independent risk factor for hypertension, diabetes mellitus, cardiovascular diseases, and stroke leading to increased cardiometabolic morbidity and mortality.

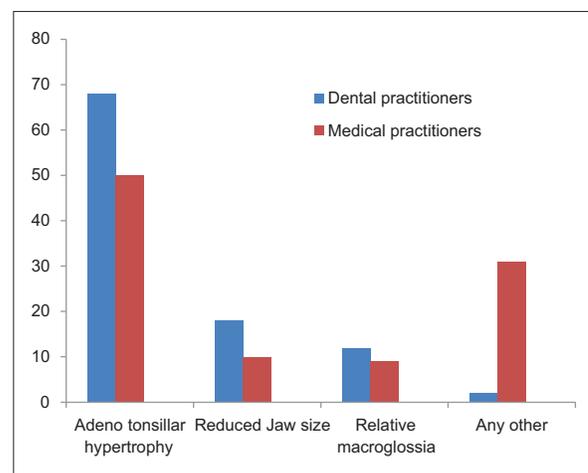


Figure 1: Most common orofacial finding made to suspect obstructive sleep apnea

Table 1: Survey - weblinks

Practitioners	Weblink 1	Weblink 2
Dental practitioners	<a href="http://www.surveymonkey.com/r/NKVBZ3f">http://www.surveymonkey.com/r/NKVBZ3f</a>	<a href="http://www.surveymonkey.com/r/rqpPGRH">http://www.surveymonkey.com/r/rqpPGRH</a>
Medical practitioners	<a href="http://www.surveymonkey.com/RW67JZJ">http://www.surveymonkey.com/RW67JZJ</a>	<a href="http://www.surveymonkey.com/r/TD36HQV">http://www.surveymonkey.com/r/TD36HQV</a>

The key step in the management of OBSA is to firmly establish the diagnosis. Not only a medical practitioner but also the dental practitioner in general and the orthodontist, in particular, now have an ever-increasing role in the recognition of a patient who may be at a risk for sleep disorder. Even in an ambulatory setting, initial screening can be done by evaluating history (asking for the presence of snoring and mouth breathing) and also clinical symptoms, especially excessive daytime sleepiness (by scoring the Epworth sleepiness scale)<sup>[10]</sup> and by recording craniofacial traits and obesity-related measures – anthropometric recordings (body mass index [BMI] and neck circumference). The Stanford morphometric model is a useful screening test to investigate the possibility of OBSA in patients which combines the measurements of the oral cavity with BMI and neck circumference and was tested on Caucasian patients and found that values equal to or >70 typically had OBSA. A revision of this method for making intraoral measurements was done in a pilot study in Indian population.<sup>[11]</sup> The most common orofacial characteristics of OBSA patients include a maxillary and mandibular retrognathia, narrow palate, large neck circumference, long soft palate, tonsillar hypertrophy, nasal septal deviation, and relative macroglossia. Dental practitioners need to correlate the initial screening procedures of OBSA with the orofacial characteristics, and the dentist has to refer the suspicious patient for further medical evaluation to the physician.

Overnight polysomnography is the gold standard for the detection of OBSA – hypopnea syndrome. The final diagnosis of sleep disorder, its severity, and comorbidities are made by a physician according to polysomnography findings. Based on apnea–hypopnea index, the severity of OBSA is made and the treatment management is planned. OBSA is a condition that can be managed through surgical or nonsurgical methods. Nonsurgical methods include diet, medication, continuous positive airway pressure, and oral appliance therapy.<sup>[12-15]</sup> when non surgical methods fail surgical procedures for treatment of obstructive sleep apnea can be done.<sup>[16-19]</sup>

There are several recent advances in diagnostic technology of OBSA such as use of cone-beam tomography in airway imaging,<sup>[20]</sup> computational fluid dynamics,<sup>[21,22]</sup> to accurately diagnose the airway obstruction. Hence, it is important for the medical and dental practitioners to recognize and identify those affected patients for early and appropriate treatments as the majority of affected are still undiagnosed. Hence, issues regarding the OBSA are questioned to the dental and medical practitioners to identify their awareness about OBSA, role of oral appliance therapy, and also about the cross-reference among medical practitioners, and orthodontist and their interdisciplinary framework are evaluated by this questionnaire.

## CONCLUSION

The role of orthodontist in management of OBSA by oral appliance therapy or by surgical maxillomandibular advancement therapy was not well known to general dental practitioners and to the medical practitioners. Hence, better protocol and clinical guideline for the evaluation and management of OBSA can follow by the practitioners to improve the quality of life of the affected individuals.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

## REFERENCES

- Ramar K, Dort LC, Katz SG, Lettieri CJ, Harrod CG, Thomas SM, et al. Clinical practice guideline for the treatment of obstructive sleep apnea and snoring with oral appliance therapy: An update for 2015. *J Clin Sleep Med* 2015;11:773-827.
- Jaradat M, Rahhal A. Obstructive sleep apnea, prevalence, etiology and role of dentist and oral appliances in treatment: Review article. *Open J Stomatol* 2015;5:187-201.
- Vigg A, Vigg A, Vigg A. Awareness of issues related to sleep disordered breathing amongst practicing physicians. *Indian J Chest Dis Allied Sci* 2005;47:25-9.
- Gong X, Zhang J, Zhao Y, Gao X. Long-term therapeutic efficacy of oral appliances in treatment of obstructive sleep apnea-hypopnea syndrome. *Angle Orthod* 2013;83:653-8.
- Chan AS, Lee RW, Cistulli PA. Dental appliance treatment for obstructive sleep apnea. *Chest* 2007;132:693-9.
- Almeida FR, Lowe AA, Sung JO, Tsuike S, Otsuka R. Long-term sequelae of oral appliance therapy in obstructive sleep apnea patients: Part 1. Cephalometric analysis. *Am J Orthod Dentofacial Orthop* 2006;129:195-204.
- Ghandeharioun H, Rezaeitalab F, Lotfi R. Accurate methods for home-based diagnosis of obstructive sleep apnea: A review. *Rev Clin Med* 2016;3:8-12.
- Lam JC, Sharma SK, Lam B. Obstructive sleep apnoea: Definitions, epidemiology and natural history. *Indian J Med Res* 2010;131:165-70.
- Johal A, Battagel JM, Kotecha BT. Sleep nasendoscopy: A diagnostic tool for predicting treatment success with mandibular advancement splints in obstructive sleep apnoea. *Eur J Orthod* 2005;27:607-14.
- Epstein LJ, Kristo D, Strollo PJ Jr., Friedman N, Malhotra A, Patil SP, et al. Clinical guideline for the evaluation, management and long-term care of obstructive sleep apnea in adults. *J Clin Sleep Med* 2009;5:263-76.
- Nainan O, Jayan B, Chopra SS, Mukherjee M. Revision of Estimation Method for an Established Morphometric Model for Prediction of Obstructive Sleep Apnea: A Pilot Study. *J Sleep Disorders Ther*. 2014;3:1-5.
- Almeida FR, Mulgrew A, Ayas N, Tsuda H, Lowe AA, Fox N, et al. Mandibular advancement splint as short-term alternative treatment in patients with obstructive sleep apnea already effectively treated with continuous positive airway pressure. *J Clin Sleep Med* 2013;9:319-24.
- Yow M. An overview of oral appliances and managing the airway in obstructive sleep apnea. *Semin Orthod* 2009;15:88-93.
- Cote EF. Obstructive sleep apnea – An orthodontic concern. *Angle Orthod* 1988;58:293-307.

15. Bondemark L, Lindman R. Craniomandibular status and function in patients with habitual snoring and obstructive sleep apnoea after nocturnal treatment with a mandibular advancement splint: A 2-year follow-up. *Eur J Orthod* 2000;22:53-60.
16. Ahn HW, Cho IS, Cho KC, Choi JY, Chung JW, Baek SH. Surgical treatment modality for facial esthetics in an obstructive sleep apnea patient with protrusive upper lip and acute nasolabial angle. *Angle Orthod* 2013;83:355-63.
17. Ngiam J, Kyung HM. Microimplant-based mandibular advancement therapy for the treatment of snoring and obstructive sleep apnea: A prospective study. *Angle Orthod* 2012;82:978-84.
18. Lye KW, Deatherage JR. Surgical maxillomandibular advancement technique. *Semin Orthod* 2009;15:99-104.
19. Lye KW, Deatherage JR. Surgical procedures for the treatment of obstructive sleep apnea. *Semin Orthod* 2009;15:94-8.
20. McCrillis JM, Haskell J, Haskell BS, Brammer M, Chenin D, Scarfe WC, *et al.* Obstructive sleep apnea and the use of cone beam computed tomography in airway imaging: A review. *Semin Orthod* 2009;15:63-9.
21. Sittitavornwong S, Waite PD, Shih AM, Koomullil R, Ito Y, Cheng GC, Wang D. Evaluation of obstructive sleep apnea syndrome by computational fluid dynamics. *Semin Orthod* 2009;15:105-31.
22. Sung SJ, Jeong SJ, Yu YS, Hwang CJ, Pae EK. Customized three-dimensional computational fluid dynamics simulation of the upper airway of obstructive sleep apnea. *Angle Orthod* 2006;76:791-9.