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Awareness, Attitude and Knowledge of Parents and Pedodontists regarding Pediatric Obstructive Sleep Apnoea (POSA) – a Survey Study

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Abstract

Introduction: Paediatric Obstructive Sleep Apnoea (OSA) is a very common disorder of breathing characterized by prolonged, partial upper airway obstruction and/or intermittent or complete obstruction that disrupts normal ventilation during sleep and normal sleep patterns. The impact of OSA on the child may have detrimental effects on health, neuropsychological development and quality of life. **Aim:** The purpose of this study is to assess pedodontists' knowledge, opinion, education resources, clinical management, and physician referral regarding OSA and also the awareness of parents regarding prominent symptom complexes, including breathing, snoring, daytime sleepiness, and related behavioral disturbances observed in children with OSA.

Materials and Method: A questionnaire based study was conducted for pedodontists and parents of the children in the age group of 2 to 8 years and was evaluated for the same as mentioned above. A self-administered questionnaire was personally handed over to the parent and the pedodontist and collected on the same day. The data was collected and statistically analyzed.

Results: The study revealed that majority of parents were not aware about the sleeping and snoring habits of their children and pedodontists were highly aware about the diagnostic features of OSA but routine screening was not standard, and treatment was not commonly provided, hence should enhance investigation and implementation of oral appliance therapy.

Conclusion: OSA in children should be recognized as a public health problem. In identifying and treating OSA, pedodontists can play an important role by informing the child's parents and providing the primary care or referring to the physician when enlarged tonsils are observed.

Keywords: Pediatric obstructive sleep apnoea, knowledge, awareness, questionnaire pedodontist, parents.

Introduction

Sleep is a basic physiological need, and humans spend about one third of their lives sleeping. A child on an average spends almost half of his or her life sleeping while newborns sleep as much as 16 hours per day. During this long sleep period several physiological processes occur, and, occasionally pathological disorders are manifested. Obstructive sleep apnoea is one of the major sleep disorders of childhood.[1] Sleep disordered breathing comprises a group of disorders characterized by abnormal respiratory patterns and ventilation, associated with disturbances in gas exchange during REM sleep. The prevalence of sleep disordered breathing in children is approximately 2% to 5%. Sleep disordered breathing ranges from primary snoring to obstructive sleep apnea (OSA).[2]Pediatric obstructive sleep apnea is a disorder characterized by recurrent episodes of partial upper airway obstruction (hypopnea) or complete upper airway obstruction (apnea) during sleep, despite respiratory efforts, and it results in sleep disruption, usually an arousal and disrupts normal ventilation during sleep.[3] Pediatric OSA differs from adult OSA in epidemiology, mechanisms of obstruction, adverse effects, diagnostic criteria, state and severity, risk factors & recommended treatments. It is associated with poor quality of life, medical complications, increased healthcare use, somnolence, prone to accidents, cognitive dysfunction, impaired school performance, behavioral problems (including ADHD), metabolic effects and more.OSA most commonly affects children between the ages of 2 to 7 year old, an especially critical time for growth and development.[4] The clinical signs and symptoms associated with pediatric OSA are excessive daytime sleepiness, morning headaches, behavioral mood problems, insomnia, and identified comorbidities such as hypertension, regular or heavy snoring, mouth breathing, nocturnal awakenings, nocturnal sweating, bed wetting, daytime fatigue, attention deficit disorder. Objective confirmation of OSA can be done by testing during sleeping, questionnaires, home monitoring, ambulatory monitoring, imaging (CT, MRI) and polysomnography (tests for sleeping cycles).Multiple screening tools are available for adult sleep apnea like STOP-BANG questionnaire, Kushida Index but including sleep questions on the case history form helps more in identifying patients at risk.[5] Brouillette's OSA questionnaire for children initially appeared accurate in small sample, but on subsequent studies was found to be 47% indeterminate as it lead to numerous false positive and false negative results.[6] Parents cannot predict severity of OSA based on their observations as they are not well aware about the symptom complexes of OSA.[7] Thus, in this study a questionnaire was prepared for parents to know about their awareness regarding the observational symptoms of OSA. Dental sleep medicine has expanded rapidly in the last two decades, and its role in the continuum of management of OSA is emerging. As stated by Padmanabhan et al, because pediatric dentists are more likely to identify adenotonsillar hypertrophy than physicians, pediatric dentists could be the gatekeepers in screening children for OSA and identify patients at greater risk.[8]Hence this study was carried out to assess appropriate knowledge of parents and pedodontists regarding pediatric OSA which can lead to early diagnosis, timely referral and proper management of the same.

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Materials and Method

A cross sectional survey was undertaken based on two self designed single response questionnaires. One distributed among the randomly chosen sample of 60 parents of the children of 2 to 8 years old and another one among randomly chosen sample of 54 practicing pedodontists. Questionnaires were distributed and collected on the same day. Questionnaires comprised a set of 20 questions regarding sleeping, snoring and daytime habits of children for parents and a set of 23 questionsregarding knowledge about pediatric OSA for pedodontists. The data was collected and statistically analysed.

Results

The scores obtained were stored in an excel spread sheet (Microsoft, Inc., Redmond, Wash) and data was analysed by calculating percentages for each response and bar graphs were made for the same. Questions were asked to the parents regarding the sleeping habits like snoring, breathing difficulty while sleeping, sleeping with mouth open and children with congested nose at night in that 42.6% of parents reported their children were sleeping with mouth open as shown in chart

1. Then questions were asked to parents regarding daytime and behavioural habits in that 63.15% of parents reported their children were breathing through mouth and 50% of the parents reported their children with increased daytime sleepiness as shown in chart.
2. The pedodontists were well aware about the oral appliances used for OSA but the knowledge regarding diagnostic index (apnoea-hypoapnoea index) and diagnostic test (polysomnography) was relatively less; 42.85% and 40.74% respectively as shown in chart.
3. Clinically adequate numbers of mouth breathing cases were reported by pedodontists and 60.7% of pedodontists recorded sleeping and snoring history. But very few cases (9.1%) of OSA were reported to them by parents. The cases of OSA diagnosed by pedodontists routinely were 42.86% as shown in chart.
4. Questions were asked regarding the knowledge of diagnostic features of OSA to pedodontists in that 67.7% were aware that retrognathnia is associated with OSA while only 46.3% were aware that high arched palate and narrow maxillary dentition is associated with OSA as shown in chart 5.

Discussion

The American Academy of Pediatric Dentistry (AAPD) recognizes that OSA in the pediatric population if went undiagnosed and/or untreated can lead to cardiovascular complications, impaired growth, learning problems, and/or behavioral problems; untreated OSA in combination with insulin resistance and obesity in a child sets the stage for heart disease and endocrinopathies. In order to reduce such complications, AAPD encourages healthcare professionals to routinely screen their patients for increased risk for OSA and to facilitate medical referral when indicated. Pediatric dentists who perform sedation and surgical procedures in patients with OSA should be aware that these patients are more likely to experience perioperative and post-operative breathing complications.[5]

A questionnaire could be a concise and easy-to-use tool to screen for OSA but currently there is no standardized survey for practitioners to use.[4] Questionnaires have the diagnostic accuracy to be used as screening method for OSA in pediatric patients. It could be a quick and efficient way to incorporate screening of OSA into

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routine patient care but it cannot replace the gold standard test of a full polysomnography.

In this study 21% of children had snoring at night and 42.6% of children had mouth breathing. The one snored reported 83% of waking up with dry mouth. 35% of children were obese and 21.2% of children were reported with attention deficit hyperactivity disorder (ADHD). In a similar study by Tamasas B et al, 13% of children were obese and 35% had ADHD. 42% were observed with snoring and 100% among them reported dry mouth.[9]

In this study responses obtained from pedodontists showed a total of 42.85% to be unaware about diagnostic test and index for OSA; 42.86% stated that they diagnose for OSA routinely; and 69.57% referred to a physician in suspected cases of OSA. In a similar study by Keating J and Park JH a total of 41.2% of respondents were uncomfortable or very uncomfortable screening for OSA; 61.4% indicated no formal training in OSA during residency; 40.7% stated they routinely screened for OSA; and 93.9% referred to a physician.[10]

Wilhelmsson B et al compared dental appliance & uvulopalatopharyngoplasty for treatment of OSA. Dental appliance achieved mandibular advancement of 50% of maximum protrusive capacity. Both groups show significant decrease in AHI, ODI, & SI. While in this study 71.43% of pedodontists were aware that treatment of OSA can be both surgical and non surgical and only 21.4% used mandibular advancing devices.[11] Three types of oral appliances commonly were used for treatment of OSA, mandibular advancing devices, tongue retaining devices, and palatal lift appliances. Although some studies have advocated the use of non-surgical interventions such as rapid maxillary/palatal expansion (RPE) or a modified monobloc appliance, these studies had small sample sizes. According to Cozza and colleagues, a new orthodontic appliance, a modified monobloc, is not only effective in reducing apneic events during sleep, but also improves subjective sleep quality and daytime performance among children. As functional intraoral appliances alter the position and/or growth of the maxilla or mandible, a complete orthodontic assessment including records should be completed. It is advised that the pedodontist work with the physician to determine if adjunctive options (e.g., RPE, orthodontic treatment) are advised as part of a multidisciplinary treatment effort.[12, 13, 14, 15, 16]

Battagel JM & L'Estrange PR studied lateral cephalometric radiographs of 35 patients with proven OSA & 24 control. Radiographs showed significant reductions in the lengths of the mandibular body and cranial base and in cranial base angulation in OSA subjects. In this study 70.38% of pedodontists took lateral profile, anatomical and craniofacial features into consideration while screening for OSA.[17]

The major concern in this study was that only 9% cases of OSA were reported by the parents to the pedodontist. The AAPD recognizes that there may be consequences of untreated OSA. Therefore, the AAPD encourages health care professionals to:

- Screen patients for snoring and sleep-related breathing disorders.
- Screen patient for OSA.
- Assess the tonsillar pillar area for hypertrophy.
- Assess tongue positioning as it may contribute to obstruction.
- Recognize obesity may contribute to OSA.
- Refer to an appropriate medical provider (e.g., otolaryngologist, sleep medicine physician,

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pulmonologist) for diagnosis and treatment of any patient suspected of having OSA.

- Consider non-surgical intraoral appliances only after a complete orthodontic/craniofacial assessment of the patient's growth and development as part of a multi-disciplinary approach.[5]

Conclusion

Pedodontists are highly aware about the diagnostic features of OSA but routine screening is not standard, and treatment is not commonly provided, hence should enhance investigation and implementation of oral appliance therapy. They should educate families of high risk children for OSAS (e.g. obese, atopic, with hypertrophic tonsils and adenoids). Various interactive sessions should be held with different medical specialities, to make them aware about the role of pedodontist in OSA. OSA should be recognized as a public health problem.

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Legends Figures

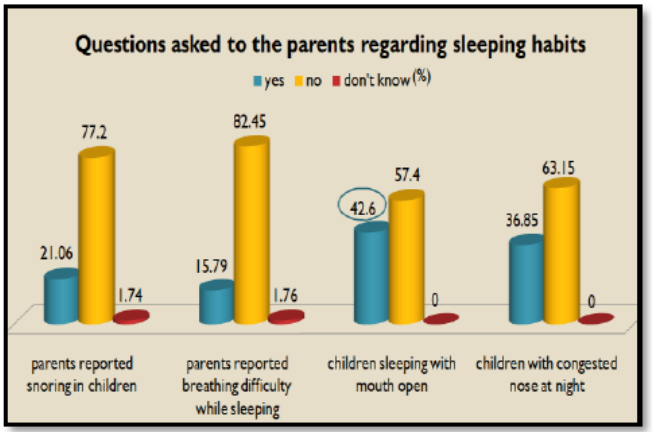
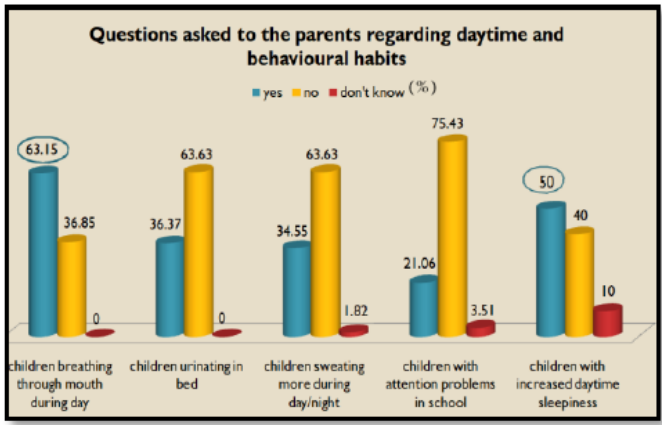


Chart : 1



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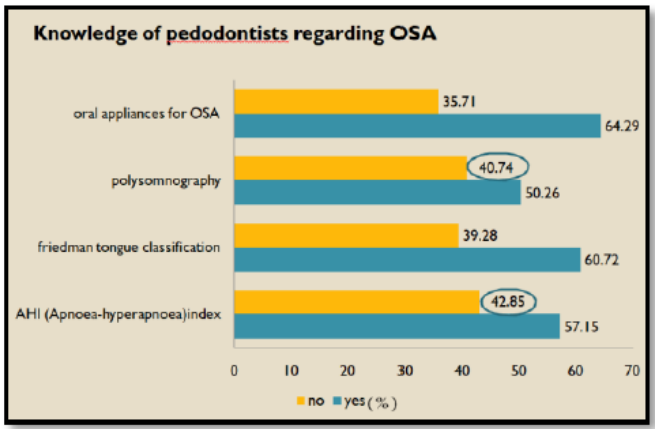

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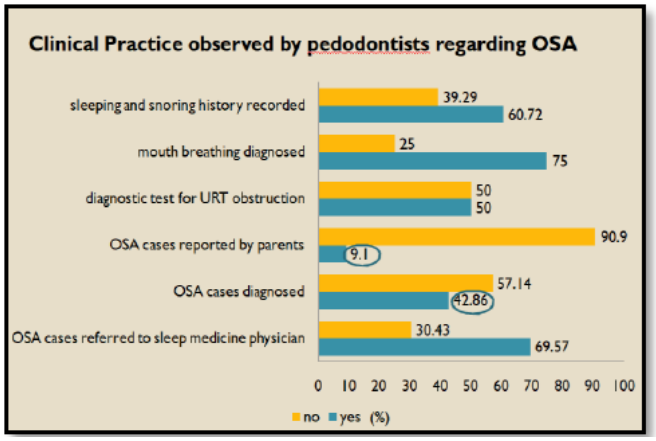

Chart :4

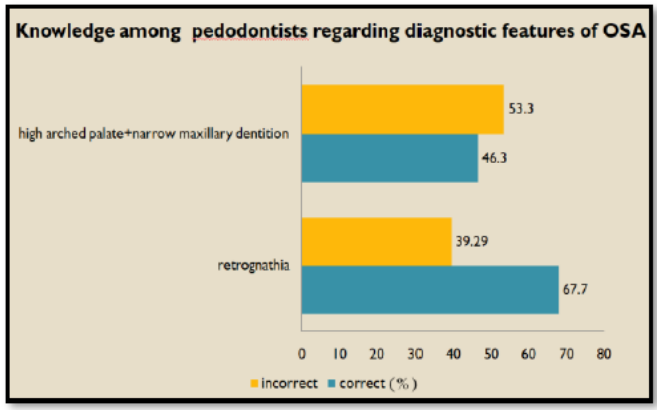

Chart : 5

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