

Pediatric Dentists:

Frontline Public Health Providers Leading the Way in Identifying and Preventing Childhood Obstructive Sleep Apnea Syndrome

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Obstructive Sleep Apnea in Children

Obstructive sleep disordered breathing (SDB) causes sleep-related breathing issues due to a partially or fully blocked airway that impairs ventilation. Up to 25% of children are affected in its mildest forms (snoring) and 1-5% in more severe forms that may include a diagnosis of Obstructive Sleep Apnea Syndrome (OSAS).¹ Acutely, children with SDB may experience symptoms such as daytime sleepiness, inattention, snoring, gasping, witnessed apnea, restless sleep, mouth breathing, excessive sweating, bedwetting, and headaches.² Several risk factors for OSAS in children have been identified in the literature including obesity, craniofacial abnormalities, tobacco smoke exposure, low socio-economic status, allergic rhinitis, asthma, and enlarged palatine tonsils.¹ Diagnosis of childhood OSAS peaks around 2-8 years of age, coinciding with peak tonsil growth.¹ If left untreated, OSAS contributes to lifelong morbidities, including cardiovascular and metabolic diseases as well as neurocognitive and behavioral challenges.¹ Children with untreated OSAS may be inappropriately diagnosed with ADHD (Attention Deficit Hyperactivity Disorder), as chronic sleep deprivation and ADHD share similar symptoms.³ Thus, childhood is a critical stage of the life course to address this potentially chronic condition.

The Role of Dentists in Diagnosis of Childhood OSAS

The oral cavity is a clear indicator of a child's overall health, positioning pediatric dentists to be uniquely equipped at the frontline of identifying and preventing the development of childhood OSAS.

During routine exams, pediatric dentists may observe these potential indicators of SDB:

- (1) an elongated or high-arched palate structure,
- (2) enlarged palatine tonsils,
- (3) presence of a crossbite (malocclusion), and/or
- (4) the presence of a tongue-tie.

These listed morphologies suggest abnormal breathing during sleep in children.² Narrow airways are associated with a mouth breathing pattern, and mouth breathing is one important factor associated with malocclusion in children.² Mouth breathing also causes dry mouth, which increases risk of dental decay (caries) and gingivitis (gum disease) due to the loss of protective properties of one's saliva.¹

Pediatric dentists can also observe wear on teeth from sleep bruxism (teeth grinding), present in up to 50% of children.⁴ Bruxism is a compensatory mechanism for airway restriction by recruiting muscles to keep the airway open during sleep.³ Additional SDB symptoms for the pediatric dentist include a forward head posture, allergic shiners, dry, chapped lips, strain when closing lips together, a gummy smile, and a child's facial profile (i.e., long face/vertical growth pattern, retruded lower jaw, or relatively straight profile).³

Prevention, Screening, Diagnosis and Treatment Requires an Interdisciplinary Approach

Prevention of OSAS begins at birth. Pediatric dentists have the capacity to positively influence proper craniofacial development from infancy. Breastfeeding is the first, and possibly, the most important experience to facial development.⁵ It fosters proper craniofacial development through encouraging proper lip closure, stimulating mandibular function, and ensures correct positioning of the tongue against the palate, leading to balanced muscular development and nasal breathing.⁶ Exclusively breastfed babies have a lower risk of malocclusion when compared to bottle-fed babies, and the risk of malocclusion continues to fall as the duration of breastfeeding increases.⁶

The presence of a tongue-tie at birth often impedes breastfeeding success and its subsequent benefits to infant craniofacial development.⁵ A tongue-tie is a thick, tight or short string of tissue under the tongue that restricts the tongue's movement. A tongue-tie can lead to the development of a high palate, which takes space from the nasal cavity and thereby promotes mouth breathing and puts a child at greater risk for SDB.³ A study of school-aged children found those breastfed for only a few months had less incidence of snoring and OSAS than those who were bottle-fed.⁵ The sooner a tongue-tie is identified and treated in infancy, the higher the likelihood of breastfeeding success and proper craniofacial development.

Risk factors for OSAS are treated by a variety of modalities and specialists. If the child presents with enlargement of the adenoids or tonsils that is blocking his/her airway, an adenotonsillectomy performed by an otolaryngologist (ENT) may be warranted, or the patient may require a Continuous Positive Air Pressure (CPAP) device.³ In the presence of an elongated or high-arched palate, orthodontists or airway dentists can perform rapid palate expansions (RPE). RPE can reduce adenoidal and tonsillar size, support proper tongue posture, and subsequently improve nasal air flow.⁷ Finally, tongue-tie releases with myofunctional therapy may effectively treat mouth breathing, snoring, jaw clenching and tension.³ Each of these treatments may prevent the development of OSAS before it becomes a chronic issue.

More Collaborative Work is Needed to Prevent and Treat Childhood OSAS

Screening is key to prevention and quick, efficient tools are available, but can be further improved. For all new patients, we recommend that pediatric dentists assess dental wear, malocclusion, tongue-ties, and dental caries experience in addition to administering the validated Pediatric Screening Questionnaire (PSQ).⁸ Although the PSQ is quick to complete, it may not be sensitive enough to predict milder forms of SDB.³ Pediatric dentists must be hyperaware of these facial and oral manifestations and should also ask sleep related questions on the six-month recall health history forms.

Effective collaboration and education are needed across specialties. Many pediatricians and pediatric ENTs are not aware that tongue-ties increase a child's risk for OSAS or that a RPE can treat OSAS. Similarly, common practice of orthodontists is to wait to expand children's palates until the age of 7 or 8, which to many airway dentists is too late, as 60% of a child's facial development is complete by age 6.³

Polysomnography, a sleep study which is the gold standard diagnostic tool for OSAS, is costly and challenging to perform in children.² Sleep study wait times are often long and may lead to prioritizing only the most severe cases, causing under-diagnosis and treatment delays.

Additionally, many children will have an array of sleep symptoms indicative OSAS yet their sleep study comes back negative and there are no protocols for what happens next. A solution might be forming local sleep study clubs for cross-disciplinary treatment. Additionally, further research on the dental caries-OSAS link is needed, and we suggest that pediatric dentists consider referrals to an airway specialist for children under six years with one or more dental caries.

Conclusion

In this symbiotic relationship between oral health and overall well-being, pediatric dentists serve as torchbearers of holistic care, illuminating a path towards healthier mouths and healthier sleep for our children. Pediatric dentists must educate and collaborate with other specialists – pediatric ENTs, orthodontists, pediatricians, lactation consultants, and sleep medicine providers – to properly prevent, screen, diagnose and treat children suspected of SDB to halt the growing epidemic of childhood OSAS.

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