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Seasonal variation in a clinical referral pediatric cohort at risk for obstructive sleep apnea

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ABSTRACT

Objective: The present study was carried to examine the hypothesis that the severity of obstructive sleep apnea (OSA) in a clinical referral population of children would manifest seasonal variability in their polysomnographic findings.

Methods: The study population comprised consecutive children referred for evaluation of habitual nighttime snoring, parentally witnessed apnea during sleep, and difficult or noisy breathing during sleep. A total of 554 children were identified as eligible and underwent full-night polysomnography (PSG). Monthly fluctuation patterns in PSG measures were assessed in 2 age groups (<6 and ≥6 years old).

Results: In the younger group, the lowest AHI was found in the month of August (9.5 ± 1.7/hrTST) while December emerged as the month with the lowest AHI for the older group (8.7 ± 2.3/hrTST). The highest AHI was in January (24.8 ± 7.5/hrTST) in the group ≥6 years old, and in March (32.7 ± 6.9/hrTST) in the younger group.

Conclusion: Seasonal changes are present in children with clinically symptomatic OSA and differ among younger and older children, with global trends toward improved AHI during summer, especially in younger children. Future studies should be conducted to define a "correction factor" for the month of PSG assessment that will enable accurate decision making when evaluating symptomatic children with habitual snoring.

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1. Introduction

Pediatric OSA is a highly prevalent disorder in children that is characterized by recurring episodes of either complete or partial upper airway obstruction during sleep, resulting in intermittent hypoxemia and hypercapnia, frequent awakenings and disrupted sleep patterns. Pediatric OSA has an estimated prevalence of 1–2% among young children and can lead to morbidity [1,2]. As increasing knowledge has accumulated on this condition, it has become apparent that pediatric OSA is a serious entity, and that it greatly differs between adults and children with respect to pathophysiology, clinical presentation, polysomnographic characteristics, and associated morbidities. Adenotonsillectomy is the most common treatment for children with OSA, and it is generally the first-line therapy for these patients. In the context of our clinical practice, we observed that symptoms of OSA in children may occasionally improve over time, suggesting that day-to-day variability and potentially seasonal variability may be present. In a recent study [3], snoring and the severity of OSA exhibited distinct and essentially non-overlapping patterns of seasonal variation, with peaks in spring–summer for snoring and peaks in winter–spring for OSA severity. These findings suggested that both seasonal viral pathogens and allergenic burdens may contribute to OSA severity, which in turn may prompt differing clinical referral patterns throughout the year. However, the children included in this study [3] originated from the community, and therefore, were not a clinical referral population, with the latter being needed to confirm the seasonal pattern of referral variation. We therefore undertook the present study to examine the hypothesis that the severity of OSA in a referral population of children would manifest a seasonally recognizable variability (Figs. 1–3).

Abbreviations: AI, apnea index; HI, hypopnea index; OA, obstructive apnea; OSA, obstructive sleep apnea; REM, rapid eye movement; SDB, sleep-disordered breathing; TST, total sleep time.

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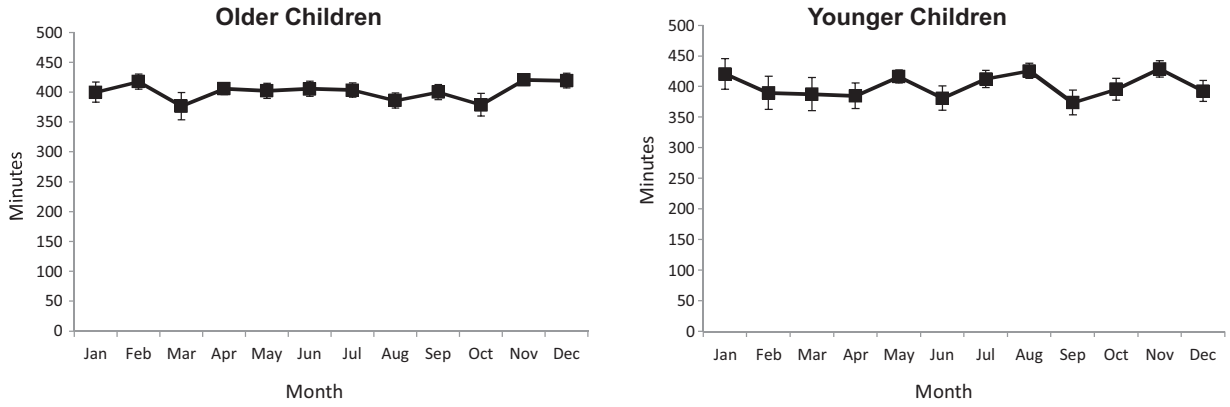

Fig. 1. Monthly trends in total sleep duration (TST) in younger children (<6 years of age) or older children (≥6 years) throughout the calendar year in habitually snoring symptomatic children referred for evaluation in the sleep clinic.

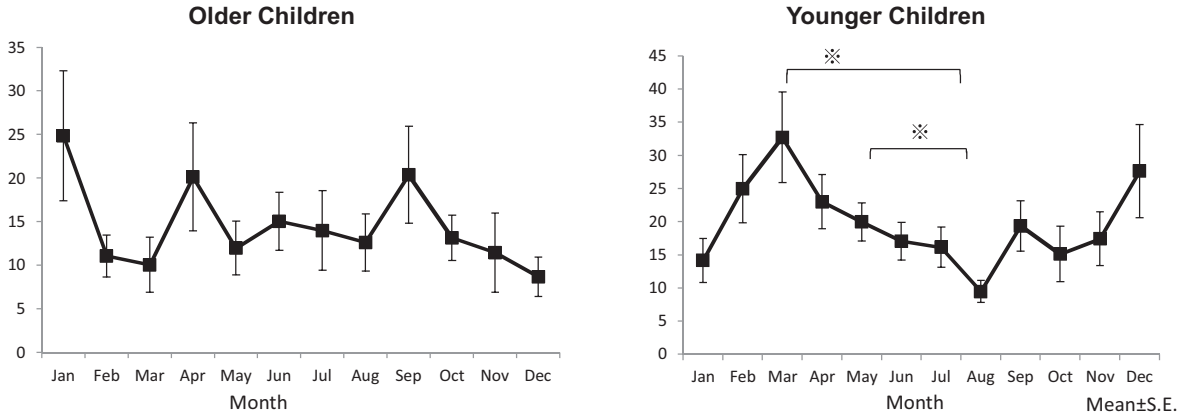

Fig. 2. Monthly trends in apnea-hypopnea index (AHI) in younger children (<6 years of age) or older children (≥6 years) throughout the calendar year in habitually snoring symptomatic children referred for evaluation in the sleep clinic.

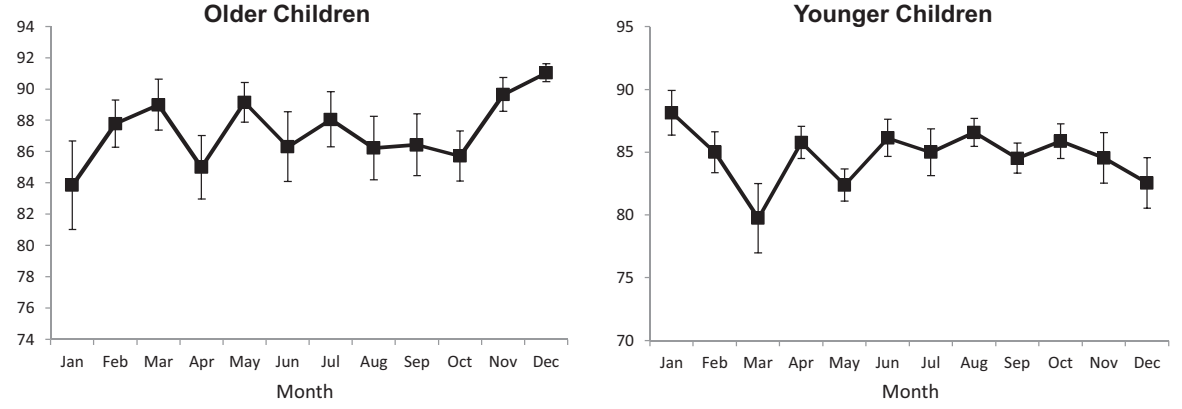

Fig. 3. Monthly trends in nadir oxyhemoglobin saturation (SpO_2) in younger children (<6 years of age) or older children (≥6 years) throughout the calendar year in habitually snoring symptomatic children referred for evaluation in the sleep clinic.

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