Demographic, clinical, and polysomnographic characteristics of children under 3 with obstructive sleep apnea.

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Introduction

What is Pediatric Obstructive Sleep Apnea?

Pediatric obstructive sleep apnea (OSA) is defined as "obstructive apneas and hypopneas caused by repetitive collapse of the airway during sleep" with increased "disturbed nocturnal sleep than excessive daytime sleepiness…and more behavioral problems" than adults.

Who is affected and what causes it?

It most commonly occurs in 4-8 year-olds. In most normal-weight children, OSA is caused by an increase in the size of the tonsils and adenoids in pre-school children. Certain comorbidities can increase the prevalence of OSA in children including prematurity, gastroesophageal reflux (GER), craniofacial abnormalities, and Down Syndrome.

Why is it relevant?

Pediatric OSA is associated with a variety of deleterious consequences including neurobehavioral changes, cognitive deficits, cardiovascular consequences, failure to thrive, and an increased risk for metabolic syndrome due to decreased sleep and intermittent hypoxia and hypercapnia.

Objective

OSA is less common in children under 3 years old and has been studied less extensively. Accurate depiction of OSA in children under 3 is necessary to prevent the associated morbidities.

The primary aim of this study was to describe the demographic, clinical, and polysomnographic characteristics of children under 3 years of age referred for polysomnography. The secondary aim was to identify demographic and clinical features that predict severe OSA in this cohort of children.

Methods

Subjects: All children under 3 years of age who completed a polysomnography (PSG) between 08/01/2012-06/01/2017 at Children's Health, Children's Medical Center Dallas.

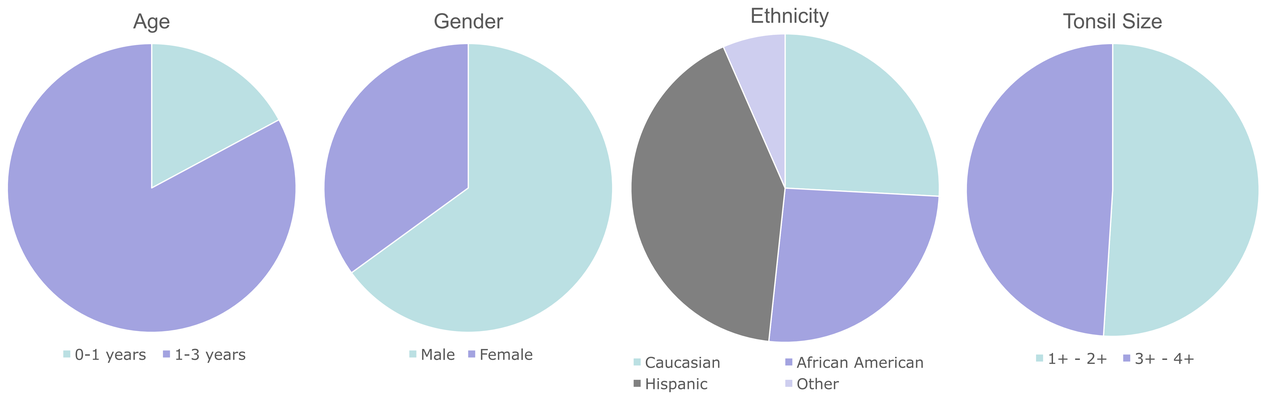
Inclusion Criteria: Children under 3 years of age that under went PSG with height, weight, tonsil size, clinical, and PSG data available.

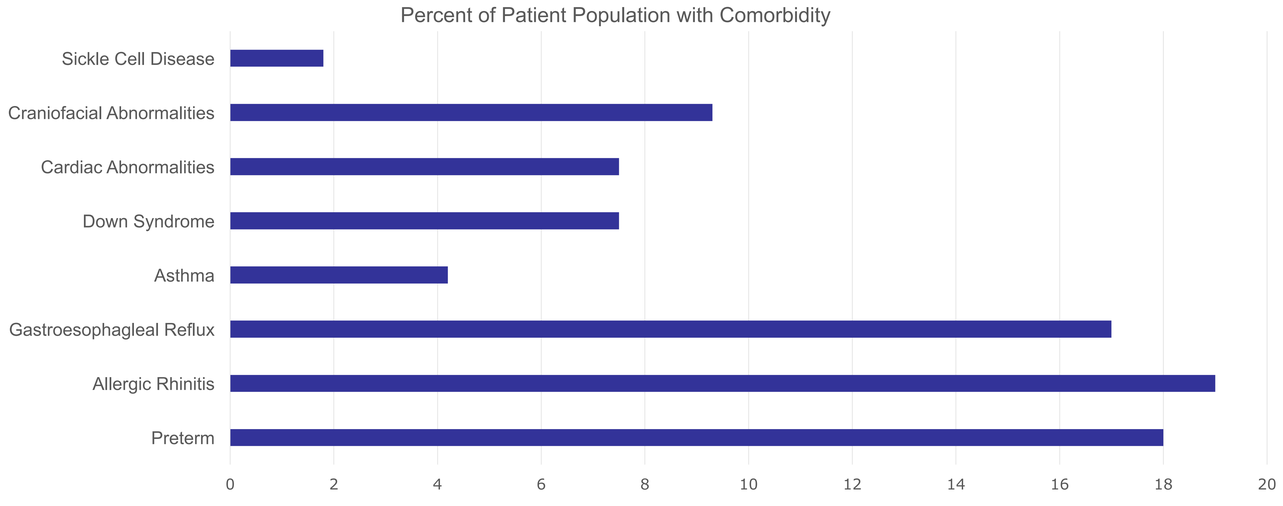
Exclusion Criteria: Missing PSG data and previous tonsillectomy and adenoidectomy (T&A).

Electronic Medical Record Variables Collected: Sex, age, ethnicity, birth status (pre-term or full-term), height, weight, tonsil size, and presence of the following: allergic rhinitis, asthma, GER, Down Syndrome, cardiac abnormalities, craniofacial abnormalities, and sickle cell disease.

PSG Variables Collected: Full-night in-laboratory PSG to record sleep efficiency, % of REM sleep, arousal index, obstructive apneas, obstructive hypopneas, OAHI index, oxygen saturation nadir, peak CO2, percentage of time spent under 90% O2 saturation, percentage of time spent over 50 mm Hg CO2.

Results





Results cont.

Statistical comparisons were made between the following groups: 0-1 and 1-3 years, obese and non-obese, and with or without comorbidities and no significant differences were seen in clinical or PSG data. Severe OSA was predicted by tonsillar hypertrophy (OR=1.97; p=0.005). We used Pearson chi-squared for categorical data and ANOVA for continuous data to test demographic and polysomnographic findings for differences between these three groups: obese versus non-obese; age 0-1 and 1-3; children with or without significant comorbidities. A $P<0.05$ was considered significant.

Conclusions

Children under 3 with OSA are more likely to be male and have a variety of comorbidities. Tonsillar hypertrophy is the primary predictor for severe OSA in young children. Additional research is needed to determine any other possible predictors for severe OSA in young children. Since this age group is also considered high risk for surgical therapy, further research is needed to predict outcomes of surgical therapy for OSA in children under 3.

References

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