



Effect of Race and Ethnicity on Pediatric Adenotonsillectomy Outcomes for OSA: A Systematic Review

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Abstract

Objectives/Hypothesis: The primary objective was to determine whether race and ethnicity have an effect on recurrence or persistence of sleep disordered breathing in children who underwent adenotonsillectomy.

Study Design: Systematic Review

Methods: Three co-authors searched the international literature independently. Five databases, including PubMed, were searched through October 12, 2016.

Results: Upon review of the literature, 811 patients from 3 studies showed that black children are at increased risk for residual sleep-disordered breathing and recurrence of sleep-disordered breathing when compared to Caucasian counterparts, as evidenced by statistically significant odds ratios (OR 3.5-15). Despite strong evidence that black children are at increased risk for continued sleep-disordered breathing after adenotonsillectomy, 1,826 patients from 4 other studies who also underwent adenotonsillectomy did not show statistically or clinically significant differences in recurrence or persistence of sleep-disordered breathing.

Conclusions: Adenotonsillectomy in children with sleep-disordered breathing, specifically pediatric obstructive sleep apnea as defined by AHI (Apnea-Hypopnea Index) > 1.0, is not always curative. While the persistence and recurrence of sleep disordered breathing remains relatively low in all comers, black children are more likely to have residual sleep-disordered breathing.

Results

Eighteen studies were reviewed in full text version. Seven studies (1,642 patients) presented data that met inclusion criteria. Of those seven studies, four studies (869 patients) found that there was a difference in outcomes (three found that black children were either less successful after surgery, or had an increased risk of recurrence of OSA and one found that the apnea-hypopnea index decreased the most in Blacks (87.9%), followed by Whites (81.4%), Hispanics (80.4%) and Other: 79.2%). Three studies (773 patients) found no statistically significant difference in outcomes based on race and/or ethnicity.

Study Quality Assessment

The seven included studies comprised of two prospective, observational studies (Amin, Morton), one multi-center randomized controlled trial (Marcus NEJM), and four case series (Bhatachejee, Smith, Tang, Tauman). All included studies met between five and seven of the eight criteria evaluated using the NICE quality assessment tool

Odds Ratio

Four studies that met inclusion criteria found that there was a difference in outcomes with regard to race or ethnicity. In particular, studies found that being of African American descent placed patients at increased risk for recurrence of obstructive sleep apnea or had less successful surgery. Tang et al found that AHI decreased the most in black patients with obstructive sleep apnea (87.9%), while AHI values from white and Hispanic patients decreased by 81.4 and 80.4% respectively.

Introduction

Pediatric obstructive sleep apnea (OSA) is diagnosis that has gained continual traction in the literature. Pediatricians and Otolaryngologists alike have implemented early interventions to minimize and/or prevent long term sequelae to include cor pulmonae, pulmonary hypertension, growth retardation, and poor school performance¹. An apnea can be defined as the cessation of movement of air lasting the duration of two baseline breaths. Using the Apnea Hypopnea Index, or AHI, OSA can be defined in three categories, mild (AHI 1.0-5.0), Moderate (5.1-10), and severe (>10).

Many studies have shown that adenotonsillectomy in pediatric patients with obstructive sleep apnea are not only beneficial, but at times curative. In a systematic review and meta-analysis published in 2006 by Brietzke, adenotonsillectomy alone was able to reduce AHI down to normal levels (AHI<1) in approximately 83% of patients². Yet despite the ever expanding literature on the clear benefit of adenotonsillectomy for pediatric patients, there remains a dearth of literature correlating outcomes on adenotonsillectomy and race.

While obstructive sleep apnea has an incidence of approximately 2% of pediatric patients in all comers, there are limited studies delineating incidence and prevalence based on race of patients¹. It is well known however that African American patients have an increased risk for sleep disordered breathing, irrespective of obesity and upper and lower respiratory disease³

Discussion

Adenotonsillectomy remains first line treatment for pediatric patient with either clinical or polysomnographic evidence of obstructive sleep apnea. Although adenotonsillectomy has shown marked reduction in obstructive sleep apnea as evidence of polysomnography, complete resolution is rare. Our systematic review shows that in those with obstructive sleep apnea, black pediatric patients may potentially be more at risk to develop recurrence or have residual obstructive sleep apnea.

Conclusions

Adenotonsillectomy in black pediatric patients does not always cure sleep apnea as defined by AHI (Apnea-Hypopnea Index) >1.0. Persistence and recurrence of sleep apnea, although low, remains more likely in black children with sleep disordered sleeping after tonsillectomy. There are studies that show no association with race and recurrent or residual OSA however, which lends credence to the fact that more studies need to be performed.

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