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Does adenotonsillectomy cure sleep apnea in obese children?

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As we have become increasingly aware of the prevalence and consequences of sleep-disordered breathing (SDB) in children, we have become more proactive in its treatment by performing adenotonsillectomy (AT) in appropriate patients.

Though this surgery can have a positive impact on overall childhood development, we must recognize the limitations of AT as the first-line treatment for SDB in obese children.

SDB describes a spectrum of abnormal respiratory patterns during sleep, of which obstructive sleep apnea (OSA) is the most severe. Enlarged tonsils and adenoids are a common cause of SDB in the pediatric population. Numerous studies have demonstrated the effectiveness of AT for the treatment of SDB using polysomnography (PSG) parameters and by assessing quality of life, cognition, memory, school performance and behavior.

Otolaryngologists recognize that medical co-morbidity, including craniofacial abnormalities such as Down syndrome and neurologic disorders such as cerebral palsy, may limit the effectiveness of AT in curing SDB and OSA; these patients are at risk for residual or recurrent disease. Over the past few years, pediatric obesity has emerged as a highly significant pediatric co-morbidity, with the prevalence of childhood obesity doubling among children 6-11 years of age and tripling among 12- to 17-year-olds between 1980 and 2000.

Obese children with OSA proven by PSG demonstrate substantial metabolic alterations and systemic inflammation as measured by fasting glucose levels, white blood cell count and neutrophil levels, high-density lipoprotein, blood pressure, C-reactive protein, and alanine aminotransferases. Improvement in these markers after AT depends on the magnitude of reduction of obstructive apnea and hypopnea index and oxygen saturation nadir, supporting the hypothesis that both SDB and obesity may play a pathogenic role for abnormal glucose and lipid metabolism.

Information gleaned from current literature presents a complex picture of surgical results. Obesity and elevated apnea-hypopnea index (AHI) at diagnosis are major determinants for incomplete normalization of PSG following surgery. While obese children are more likely to have higher postoperative AHI and residual OSA, obesity does not always predict an unsatisfactory outcome after AT.



Non-surgical options, such as the use of bi-level positive airway pressure (Bi-PAP) support, pictured above, may be necessary for residual or recurrent obstructive sleep apnea.

While much remains unanswered regarding SDB and the pathogenesis of cardiovascular and other systemic diseases, the following points are clear:

- AT is an effective first-line treatment for many children with SDB/OSA and obesity who have adenotonsillar hypertrophy, but it is not a simple cure-all. Long-term follow-up as well as non-surgical options such as continuous positive airway pressure may be necessary for residual or recurrent OSA.
- Body mass index may be the most important predictor of residual disease. Therefore, it should become a routine and mandatory clinical parameter recorded by all who care for children, including general pediatricians, pediatric subspecialists and surgeons who participate in SDB management.
- Successful treatment of SDB in obese children must include a multidisciplinary approach, with emphasis on weight-reduction for obese children regardless of whether surgical intervention is part of the treatment plan.

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