

Journal Scan

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Indian J Sleep Med 2012; 7.4, 163-169

1. *J Res Med Sci. 2011 Mar;16 Suppl 1:S387-94.*

Effects of adenoidectomy on markers of endothelial function and inflammation in normal-weight and overweight prepubescent children with sleep apnea.

Kelishadi R, Nilforoushan N, Okhovat A, Amra B, Poursafa P, Rogha M.

Source

Professor, Department of Pediatrics, Child Health Promotion Research Center, Isfahan University of Medical Sciences, Isfahan, Iran.

ABSTRACT

BACKGROUND: This trial study aimed to assess the effects of adenoidectomy on the markers of endothelial function and inflammation in normal-weight and overweight prepubescent children with obstructive sleep apnea (OSA).

METHODS: This trial study was conducted in Isfahan, Iran in 2009. The study population was comprised of 90 prepubescent children (45 normal-weight and 45 overweight children), aged between 4-10 years old, who volunteered for adenoidectomy and had OSA documented by validated questionnaire. The assessment included filling questionnaire, physical examination, and laboratory tests; it was conducted before the surgery

and was repeated two weeks and six months after the surgery.

RESULTS: Out of the 90 children evaluated, 83 completed the 2-week evaluation and 72 patients continued with the study for the 6-month follow up. Markers of endothelial function, i.e., serum adhesion molecules including endothelial leukocyte adhesion molecule (E-selectin), intercellular cell adhesion molecule-1 (ICAM-1), and vascular cell adhesion molecule-1 (sVCAM-1), and the markers of inflammation, i.e., interleukin-6, and high-sensitive C-reactive protein (hsCRP) decreased significantly in both normal-weight and overweight children after both two weeks and six months. After six months, the total and LDL-cholesterol showed a significant decrease in the overweight children.

CONCLUSIONS: The findings of the study demonstrated that irrespective of the weight status, children with OSA had increased levels of the endothelial function and inflammation markers, which improved after OSA treatment by adenoidectomy. This might be a form of confirmatory evidence on the onset of atherogenesis from the early stages of the life, and the role of inflammation in the process. The reversibility of endothelial dysfunction after improvement of OSA underscores the importance of primordial and primary prevention of chronic diseases from the early stages of the life.

KEYWORDS: Child, Endothelial Function, Inflammation, Prevention, Sleep

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2. *Minerva Pediatr.* 2011 Dec;63(6):473-81.

Sleep and obesity in children: a clinical perspective.

Kelly-Pieper K, Lamm C, Fennoy I.

Source

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ABSTRACT

Childhood obesity is an international epidemic with many long-term health consequences. The many comorbid conditions associated with obesity underscore the need to explore the different etiologies of obesity which may lead to potential therapeutic interventions. There is growing evidence both that obesity affects sleep, and that sleep patterns and disorders may have an effect on weight. Both respiratory and non-respiratory sleep disorders are associated with obesity; those that have gotten the most attention are the relationships between obesity and obstructive sleep apnea syndrome and short sleep duration. Other forms of sleep-disordered breathing and narcolepsy have also been associated with childhood obesity. Due to the many comorbidities of obesity, this subset of the pediatric population has frequent health care visits across a variety of subspecialties. It is likely that a non-sleep physician will be the first to recognize a sleep-related problem. The aim of this review was to discuss sleep disorders that may be encountered by the general pediatrician and the pediatric subspecialists in their obese pediatric patients and to describe the evidence that links these disorders to obesity.

3. *Sleep.* 2011 Nov 1;34(11):1509-17.

The Childhood Adenotonsillectomy Trial (CHAT): rationale, design, and challenges of a randomized controlled trial evaluating a standard surgical procedure in a pediatric population.

Redline S, Amin R, Beebe D, Chervin RD, Garetz SL, Giordani B, Marcus CL, Moore RH, Rosen CL, Arens R, Gozal D, Katz ES, Mitchell RB, Muzumdar H, Taylor HG, Thomas N, Ellenberg S.

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Source

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ABSTRACT

Each year, over 500,000 adenotonsillectomies (AT), mostly for the treatment of pediatric obstructive sleep apnea (OSA) are performed in the US in children under 15 years of age. No definitive study, however, has been yet conducted that has rigorously evaluated the effectiveness of AT for not only improving sleep disordered breathing, but also for improving clinically relevant outcomes, such as neurocognitive function, behavior, and quality of life. The Childhood Adenotonsillectomy Trial (CHAT) was designed to assess neuropsychological and health outcomes in children randomized to receive early AT (eAT) as compared to Watchful Waiting with Supportive Care (WWSC). Important secondary goals of the study are to evaluate outcomes in subgroups defined by obesity and race. This paper addresses key elements in the design and implementation of a controlled trial for a widely used "standard practice" surgical intervention in a pediatric population, that include establishment of standardized data collection procedures across sites for a wide variety of data types, establishment of equipoise, and approaches for minimizing unblinding of selected key personnel. The study framework that was established should provide a useful template for other pediatric controlled studies or other studies that evaluate surgical interventions.

KEYWORDS: Clinical trial, adenotonsillectomy, pediatrics, sleep apnea

4. *Turk J Pediatr.* 2011 Jul-Aug;53(4):359-63.

The effects of obstructive sleep apnea syndrome due to adenotonsillar hypertrophy on the cardiovascular system in children.

Tatlipinar A, Duman D, Uslu C, Egeli E.

Source

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ABSTRACT

Obstructive sleep apnea syndrome (OSAS) due to adenotonsillar hypertrophy (ATH) is a common and important problem in children. OSAS can lead to significant cardiopulmonary complications, poor growth and problems with learning and behavior. Many studies in the literature show that OSAS due to ATH causes pulmonary hypertension, ventricular hypertrophy and systemic hypertension in the pediatric population. In this review, we discuss the effects of ATH on cardiac function. It is well known that as a child grows, the nasopharyngeal passage becomes enlarged, helping to improve OSAS. Based on this, we discuss the possible positive effect of this age-related improvement on the obstruction of cardiovascular disturbances. Finally, the possible relationship between the duration of OSAS and the timing of surgery with the permanency of cardiovascular disturbances is discussed.

5. *Behav Sleep Med.* 2011;9(3):194-207.

Risk for sleep-disordered breathing and home and classroom behavior in Hispanic preschoolers.

Scullin MH, Ornelas C, Montgomery-Downs HE.

Source

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ABSTRACT

Pediatric sleep-disordered breathing (SDB) is known to negatively impact home and classroom behavior. Preschool-age Hispanic children from Spanish-speaking households are at elevated risk for poor school readiness. The authors used a multi-informant approach to assess home and preschool behavior among Hispanic children at risk for SDB (n = 67). Higher parent-reported SDB risk and elevated snoring were associated with parent- and teacher-reported problem behaviors and poorer teacher-reported classroom executive function among boys; elevated snoring was associated with internalizing behaviors among girls. Elevated snoring may be associated with problems related to impaired inhibitory self-control, suggesting the need for early intervention

in order to improve school readiness among these a priori defined at-risk Hispanic children.

6. *J Clin Sleep Med.* 2011 Jun 15;7(3):268-73.

Relationship between sleep apnea, fat distribution, and insulin resistance in obese children.

Canapari CA, Hoppin AG, Kinane TB, Thomas BJ, Torriani M, Katz ES.

Source

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ABSTRACT

BACKGROUND: Obstructive sleep apnea (OSA) is associated with obesity, inflammation, and insulin resistance. The role of fat distribution in OSA pathogenesis has not been established in children. The objective of the study is to examine the relationship between fat distribution, OSA, and insulin resistance in an unselected population of obese children.

METHODS: All obese (BMI > 95th percentile) children (ages 5-18 y) seen at a pediatric obesity clinic were invited to participate. Subjects underwent polysomnography, and were tested for dyslipidemia, inflammation, and insulin resistance measured by the homeostasis model assessment (HOMA). In a subset of subjects, magnetic resonance (MRI) imaging was used to determine the abdominal visceral and subcutaneous adipose tissue areas and magnetic resonance spectroscopy (MRS) spectroscopy was used to intramyocellular lipids in leg muscles.

MEASUREMENTS AND MAIN RESULTS: 31 obese subjects enrolled and completed polysomnography and serum testing, and 19 subjects underwent MRI/MRS. The mean age was 12.6 ± 3.0 y and the mean body mass index (BMI) was 39.5 ± 11.2 kg/m². Forty-eight percent had OSA (mean apnea hypopnea index [AHI] 6.26 ± 6.77 events/h) Subjects with OSA had significantly increased BMI, log HOMA, triglycerides, and leptin compared to those without OSA. In regression analysis, only BMI z-score was associated with log HOMA. In the subset of patients with imaging data, visceral fat area was strongly predictive of AHI ($p = 0.003$, $r(2) = 0.556$).

BMI z-score, gender, and age were not predictive.

CONCLUSIONS: Visceral fat distribution is independently predictive of OSA severity in obese children.

KEYWORDS: Obstructive sleep apnea, metabolic syndrome, obesity, pediatrics

7. *Sleep*. 2011 Jun 1;34(6):773-8.

Upper airway genioglossal activity in children with sickle cell disease.

Huang J, Pinto SJ, Allen JL, Arens R, Bowdre CY, Jawad AF, Mason TB 2nd, Ohene-Frempong K, Smith-Whitley K, Marcus CL.

Source

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ABSTRACT

STUDY OBJECTIVES: The prevalence of obstructive sleep apnea syndrome (OSAS) in sickle cell disease (SCD) has been reported to be higher than that in the general pediatric population. However, not all subjects with SCD develop OSAS. We hypothesized that SCD patients with OSAS have a blunted neuromuscular response to subatmospheric pressure loads during sleep, making them more likely to develop upper airway collapse.

DESIGN: Subjects with SCD with and without OSAS underwent pressure-flow measurements during sleep using intraoral surface electrodes to measure genioglossal EMG (EMG_{gg}). Two techniques were applied to decrease the nasal pressure (P(N)) to subatmospheric levels, resulting in an activated and relatively hypotonic upper airway. The area under the curve of the inspiratory EMG_{gg} moving time average was analyzed. EMG_{gg} activity was expressed as a percentage of baseline. Changes in EMG_{gg} in response to decrements in nasal pressure were expressed as the slope of the EMG_{gg} vs. nasal pressure (slope of EMG_{gg}-P(N)).

SETTING: Sleep laboratory.

PARTICIPANTS: 4 children with SCD and OSAS and 18 children with SCD but without OSAS.

RESULTS: THE MAJOR FINDINGS OF THIS

STUDY WERE: (1) using the activated but not the hypotonic technique, the slope of EMG_{gg}-P(N) was more negative in SCD controls than SCD OSAS; (2) the slope of EMG_{gg}-P(N) was significantly lower using the activated technique compared to the hypotonic technique in SCD controls only; (3) similarly, the critical closing pressure, P_{crit}, was more negative using the activated technique than the hypotonic technique in SCD controls but not in SCD OSAS.

CONCLUSION: This preliminary study has shown that children with SCD but without OSAS have more prominent upper airway reflexes than children with SCD and OSAS.

KEYWORDS: Critical pressure, sleep disordered breathing, slow wave sleep

8. *Sleep*. 2011 Mar 1;34(3):379-88

Practice parameters for the respiratory indications for polysomnography in children.

Aurora RN, Zak RS, Karippot A, Lamm CI, Morgenthaler TI, Auerbach SH, Bista SR, Casey KR, Chowdhuri S, Kristo DA, Ramar K; American Academy of Sleep Medicine.

Source

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ABSTRACT

BACKGROUND: There has been marked expansion in the literature and practice of pediatric sleep medicine; however, no recent evidence-based practice parameters have been reported. These practice parameters are the first of 2 papers that assess indications for polysomnography in children. This paper addresses indications for polysomnography in children with suspected sleep related breathing disorders. These recommendations were reviewed and approved by the Board of Directors of the American Academy of Sleep Medicine.

METHODS: A systematic review of the literature was performed, and the American Academy of Neurology grading system was used to assess the quality of evidence. **RECOMMENDATIONS FOR PSG USE:** 1. Polysomnography in children should be performed and

interpreted in accordance with the recommendations of the AASM Manual for the Scoring of Sleep and Associated Events. (Standard) 2. Polysomnography is indicated when the clinical assessment suggests the diagnosis of obstructive sleep apnea syndrome (OSAS) in children. (Standard) 3. Children with mild OSAS preoperatively should have clinical evaluation following adenotonsillectomy to assess for residual symptoms. If there are residual symptoms of OSAS, polysomnography should be performed. (Standard) 4. Polysomnography is indicated following adenotonsillectomy to assess for residual OSAS in children with preoperative evidence for moderate to severe OSAS, obesity, craniofacial anomalies that obstruct the upper airway, and neurologic disorders (e.g., Down syndrome, Prader-Willi syndrome, and myelomeningocele). (Standard) 5. Polysomnography is indicated for positive airway pressure (PAP) titration in children with obstructive sleep apnea syndrome. (Standard) 6. Polysomnography is indicated when the clinical assessment suggests the diagnosis of congenital central alveolar hypoventilation syndrome or sleep related hypoventilation due to neuromuscular disorders or chest wall deformities. It is indicated in selected cases of primary sleep apnea of infancy. (Guideline) 7. Polysomnography is indicated when there is clinical evidence of a sleep related breathing disorder in infants who have experienced an apparent life-threatening event (ALTE). (Guideline) 8. Polysomnography is indicated in children being considered for adenotonsillectomy to treat obstructive sleep apnea syndrome. (Guideline) 9. Follow-up PSG in children on chronic PAP support is indicated to determine whether pressure requirements have changed as a result of the child's growth and development, if symptoms recur while on PAP, or if additional or alternate treatment is instituted. (Guideline) 10. Polysomnography is indicated after treatment of children for OSAS with rapid maxillary expansion to assess for the level of residual disease and to determine whether additional treatment is necessary. (Option) 11. Children with OSAS treated with an oral appliance should have clinical follow-up and polysomnography to assess response to treatment. (Option) 12. Polysomnography is indicated for noninvasive positive pressure ventilation (NIPPV) titration in children with other sleep related breathing disorders. (Option) 13. Children treated with mechanical ventilation may benefit from periodic evaluation with polysomnography to adjust ventilator settings. (Option) 14. Children treated with tracheostomy for sleep related breathing disorders benefit from polysomnography as

part of the evaluation prior to decannulation. These children should be followed clinically after decannulation to assess for recurrence of symptoms of sleep related breathing disorders. (Option) 15. Polysomnography is indicated in the following respiratory disorders only if there is a clinical suspicion for an accompanying sleep related breathing disorder: chronic asthma, cystic fibrosis, pulmonary hypertension, bronchopulmonary dysplasia, or chest wall abnormality such as kyphoscoliosis. (Option) RECOMMENDATIONS AGAINST PSG USE: 16. Nap (abbreviated) polysomnography is not recommended for the evaluation of obstructive sleep apnea syndrome in children. (Option) 17. Children considered for treatment with supplemental oxygen do not routinely require polysomnography for management of oxygen therapy. (Option)

CONCLUSIONS: Current evidence in the field of pediatric sleep medicine indicates that PSG has clinical utility in the diagnosis and management of sleep related breathing disorders. The accurate diagnosis of SRBD in the pediatric population is best accomplished by integration of polysomnographic findings with clinical evaluation.

KEYWORDS: Polysomnography, clinical utility, indications, obstructive sleep apnea syndrome, pediatric, sleep related breathing disorders

9. *J Natl Med Assoc.* 2011 Jan;103(1):27-30.

Pediatric obesity: observed impact in the ambulatory surgery setting.

Olutoye OA, Watcha MF, Andropoulos DB.

Source

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ABSTRACT

More obese children are presenting for surgery, reflecting an increase in comorbidities requiring surgery or an increased prevalence in the community. The objectives of this study were to determine the prevalence of obesity in our pediatric surgery patient population, detect ethnic disparities amongst this cohort of obese patients and also to determine any increase in pediatric obesity related

comorbidities requiring surgery. Day surgery patients between ages 3 and 17 years were prospectively studied over a 3-month period. The proportion of obese children, demographics, and surgical procedures were determined. Of the 1559 patients analyzed, 312 (20%) were obese. Close to half of this subset of children were of Hispanic descent. Adenotonsillectomy was the most common surgery; however, the case distribution of this cohort was similar to our operating room database. Prevalence of pediatric obesity in our day surgery patients therefore reflects that of the community and has not resulted in an increase in related comorbidities requiring surgery. Longitudinal studies to assess the incidence of pediatric obesity related complications will be beneficial.

10. *J Clin Sleep Med.* 2011 Apr 15;7(2):163-71.

Racial/ethnic differences in the prevalence of snoring and sleep disordered breathing in young children.

Goldstein NA, Abramowitz T, Weedon J, Koliskor B, Turner S, Taioli E.

Source

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ABSTRACT

STUDY OBJECTIVE: To determine whether there are racial/ethnic differences in the prevalence of pediatric snoring and sleep disordered breathing (SDB).

METHODS: In this cross-sectional study, parents or caretakers of 346 children, aged 2 through 6 years, attending well-child care visits at 5 general pediatric offices and clinics (3 academic, 2 private) in Brooklyn, NY completed the Sleep-Related Breathing Disorders Scale of the Pediatric Sleep Questionnaire (PSQ) along with a survey on demographics, prior treatment for SDB, and parental knowledge of pediatric SDB. The child's height and weight were recorded from the office visit.

RESULTS: The prevalence of snoring was 13.9% (95% CI 10.2, 17.5) and of SDB was 9.4% (95% CI 6.3, 12.6). The odds of snoring for black children was 2.5 as great as for white children, and for Hispanic children was 2.3 as great as for white children ($p = 0.031$). There

was a higher, non-statistically significant prevalence of abnormal PSQ scores in black and Hispanic children than white children. On multivariate analysis, only black race (OR 3.1 95% CI 1.1, 8.9) and prematurity (OR 4.4 95% CI 1.6, 12.4) were associated with snoring; male gender (OR 2.9 95% CI 1.1, 8.5) was associated with SDB. Knowledge regarding SDB was low among parents and caretakers. The degree of knowledge present was not associated with parental concern about snoring and discussion of the snoring with the child's pediatrician.

CONCLUSIONS: Black race and prematurity are independent predictors of snoring. The degree of parental knowledge regarding SDB was not associated with seeking medical treatment.

KEYWORDS: Sleep disordered breathing, children, epidemiology, ethnic groups, obstructive sleep apnea

11. *Arch Otolaryngol Head Neck Surg.* 2011 Mar;137(3):269-74.

Increased prevalence of obstructive sleep apnea in patients with cleft palate.

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Source

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ABSTRACT

OBJECTIVE: To evaluate the prevalence of sleep-disordered breathing (SDB) and/or obstructive sleep apnea (OSA) in the population with nonsyndromic cleft palate.

DESIGN: Retrospective medical record review of symptoms of SDB and/or OSA and results of polysomnography (PSG) studies.

SETTING: The craniofacial clinic of a tertiary pediatric hospital.

PATIENTS: A total of 459 patients, with an additional 48 patients with Pierre Robin syndrome, met inclusion criteria.

MAIN OUTCOME MEASURES: Medical records

from January 1, 2005, through July 31, 2009, were reviewed for demographic data, SDB symptoms, surgical procedures, and PSG results.

RESULTS: Of the 459 patients, 172 (37.5%) had symptoms of SDB and 39 (8.5%) had PSG-diagnosed OSA. Forty-six patients underwent 1 or more PSGs, with results of 49 of the 59 studies (83.1%) being positive for OSA. Surgical procedures to address SDB and/or OSA were undertaken in 89 patients (51.7%), with combined tonsillectomy and adenoidectomy the most common procedure (44.9%). An additional 48 patients

who met the inclusion criteria with a diagnosis of Pierre Robin syndrome were also identified. In this population, 35 patients (72.9%) had symptoms of SDB and/or OSA.

CONCLUSIONS: An increased prevalence of SDB and/or OSA exists in the population with cleft palate, with an even greater prevalence in patients with Pierre Robin syndrome. Definitive diagnosis of OSA by PSG is underused. We suggest that surgical management of SDB and/or OSA be followed by PSG to demonstrate resolution or persistence of symptoms to ensure appropriate further management.