



Longitudinal Impact of Resolution of Snoring in Young Children on Psychosocial Functioning

Sarah N. Biggs, PhD^{1,2}, Lisa M. Walter, PhD^{1,2}, Angela R. Jackman, PhD³, Lauren C. Nisbet, MBBS, PhD¹, Aidan J. Weichard, BSc (Hons)¹, Samantha L. Hollis, BA (Hons)¹, Margot J. Davey, MBBS^{1,2,4}, Vicki Anderson, PhD⁵, Gillian M. Nixon, MD^{1,2,4}, and Rosemary S. C. Horne, PhD^{1,2}

Objective To determine whether sustained resolution of sleep disordered breathing (SDB) in young children, either because of treatment or spontaneous recovery, predicted long-term improvements in quality of life, family functioning, and parental stress.

Study design Children diagnosed with primary snoring (n = 16), mild obstructive sleep apnea (OSA, n = 11), moderate-severe (MS) OSA (n = 8), and healthy nonsnoring controls (n = 25) at ages 3-5 years underwent repeat polysomnography at 6-8 years. Parents completed quality of life and parental stress questionnaires at both time points. Resolution of SDB was determined as obstructive apnea hypopnea index (OAHI) ≤ 1 event/hour, or absence of snoring during polysomnography or on parent report. Linear mixed-model analyses determined the effects of resolution on psychosocial morbidity. OAHI was used to determine the predictive value of changes in SDB severity on psychosocial outcomes.

Results Fifty percent of primary snoring, 45% mild OSA, and 63% MS OSA resolved, of which 67% received treatment. Children originally diagnosed with SDB continued to show significant psychosocial impairments compared with nonsnoring controls, irrespective of resolution. A reduction in OAHI predicted improvements in physical symptoms, school functioning, family worry and family relationships, and stress related to a difficult child.

Conclusions Treatment was more likely to result in resolution of SDB if original symptoms were MS. Children originally diagnosed with SDB, irrespective of resolution, continued to experience psychosocial dysfunction suggesting additional interventions are required. (*J Pediatr* 2015;167:1272-79).

Sleep disordered breathing (SDB) is common in children and ranges in severity from primary snoring, characterized by habitual snoring with no gas exchange abnormalities or sleep fragmentation, to severe obstructive sleep apnea (OSA), characterized by hypoxemia, hypercapnia, and frequent arousals from sleep.^{1,2} SDB in children is predominantly caused by enlarged tonsils and adenoids with prevalence peaking during the preschool years when the size of pharynx is at its smallest compared with the lymphoid tissue.^{2,3} A second peak during adolescence has been observed more recently, which has been attributed to the increasing prevalence of childhood obesity.⁴ Research has shown that SDB in children, irrespective of severity, carries a high psychosocial morbidity including increased behavioral problems,⁵⁻⁷ reduced quality of life (QOL),⁸⁻¹¹ poorer family relationships,^{9,10} and increased parental stress.¹⁰

Treatment efficacy studies have shown a marked improvement in QOL for children,¹²⁻¹⁸ however, these studies have predominantly had short-term follow-up periods,^{13,15,16,18} have not objectively assessed SDB or examined effects of severity of disease,¹⁸ or have not compared the results with children with SDB who did not receive treatment.¹⁷ The most common treatment for OSA in children is removal of the tonsils and/or adenoids¹⁹ but surgical, and to some extent, medical treatment is not common in children with primary snoring, despite demonstrated morbidity. In addition, treatment efficacy studies are confounded as surgery does not always resolve sleep and breathing problems, and a proportion of children who are not treated will spontaneously resolve.²⁰⁻²²

This study aimed to determine whether sustained resolution of SDB, either because of treatment or spontaneous, that was originally diagnosed during the

Child PedsQL	PedsQL 4.0 Generic Core Scales Parent-Report	PedsQL	Pediatric Quality of Life Inventory
Family PedsQL	36-item PedsQL Family Impact Module	PSG	Polysomnography
HRQOL	Health-related QOL	PSI	Parenting stress index
MS	Moderate-severe	QOL	Quality of life
NREM	Non-REM	REM	Rapid eye movement
OAHI	Obstructive apnea hypopnea index	SDB	Sleep disordered breathing
OSA	Obstructive sleep apnea	SRI	Social risk index
		TST	Total sleep time

From the ¹The Ritchie Center, Hudson Institute of Medical Research; ²Department of Pediatrics, Monash University; ³Melbourne School of Psychological Sciences, University of Melbourne; ⁴Melbourne Children's Sleep Center, Monash Children's Hospital, Monash Medical Center; and ⁵Clinical Sciences Research, Murdoch Children's Research Institute, Melbourne, Australia

Funded by the National Health and Medical Research Council of Australia (APP491001 and APP1008919) and the Victorian Government's Operational Infrastructure Support Program. The authors declare no conflicts of interest.

0022-3476/\$ - see front matter. Copyright © 2015 Elsevier Inc. All rights reserved.

<http://dx.doi.org/10.1016/j.jpeds.2015.09.016>

preschool years, predicted improvements in QOL, family functioning, and parental stress.

Methods

The Monash Health and Monash University Human Research Ethics Committees granted ethical approval. Written informed consent and verbal assent was obtained from parents and children, respectively.

Children ($n = 160$, 3-5 years of age) without comorbid conditions, clinically referred to the Melbourne Children's Sleep Center for assessment of SDB, and age-matched, non-snoring controls ($n = 42$), recruited through community advertisements, underwent overnight polysomnography (PSG) and psychometric testing between 2008 and 2011.^{6,10,23-25} A total of 115 children with SDB and 38 nonsnoring controls had complete PSG and psychosocial data at baseline and were eligible to participate in the current study.¹⁰ Parents were informed of the longitudinal nature of the study at baseline, and annual newsletters were sent as a reminder of their intent to return. Three years following the baseline study, families were invited to return for follow-up. A proportion of children with SDB received treatment following the initial baseline study. The decision to treat was made by parents in consultation with their treating physician and was independent of this study. Parents who declined to return were asked the reasons for refusal, what treatment, if any, their child received following the baseline study, and the child's current snoring status.

Protocol

The protocols for the baseline and follow-up studies were identical. Children underwent 1 overnight PSG. Height and weight were measured and converted to a body mass index z-score to adjust for sex and age.²⁶ Questionnaires relating to demographics, general health, and behavior were completed by parents on the night of the PSG. Questionnaires pertaining to QOL, family functioning, and parental stress were completed during the psychometric testing, which was conducted in the home approximately 3 weeks (mean \pm SD = 19 ± 11 days) following the PSG. Both parents and the researcher were blinded to the results of the follow-up PSG at the time the questionnaires and psychometric testing were completed.

PSG

Electrophysiological signals were recorded using a commercially available PSG system (E-Series; Compumedics, Melbourne, Australia) using standard pediatric recording techniques as previously described.^{6,10}

Studies were manually sleep-staged into 30-second epochs, and respiratory events scored by experienced pediatric sleep technologists using standard clinical protocols.^{27,28} Sleep variables included sleep onset latency (time from lights out to first epoch of sleep), wake after sleep onset (percentage of time awake from first epoch of sleep to end of study), total

sleep time (TST, time asleep from first epoch of sleep to end of study), sleep efficiency (wake after sleep onset/TST expressed as a percentage) and percentage of TST spent in non-rapid eye movement (REM) (NREM) sleep, consisting of 3 stages of increasing sleep depth (N1, N2, N3), and REM sleep. Severity of SDB was determined using the obstructive apnea hypopnea index (OAHI). The OAHI was defined as the total number of obstructive apneas (full obstruction), mixed apneas (both central and obstructive), obstructive hypopneas, and respiratory events related arousal or desaturation (partial obstruction) per hour of TST. Criteria for the categorization of SDB severity were primary snoring-OAHI ≤ 1 event/hour with a clinical history of snoring; mild OSA-OAHI $> 1-5$ events/hour; or moderate-severe (MS) OSA-OAHI > 5 events/hour.

At follow-up, all children originally diagnosed with SDB, regardless of severity, were combined and divided into 2 groups according to whether their SDB had resolved (resolved, unresolved). SDB was considered resolved if OAHI ≤ 1 , there was no snoring reported during the PSG, and no snoring was reported on the OSA-18 questionnaire. Any child with an OAHI > 1 event/hour or any child with primary snoring with an OAHI ≤ 1 event/hour but who continued to snore were categorized as unresolved.

Demographic Information

Family structure, parental level of education, parental occupation, maternal age at child's birth, and English language exposure were recorded. Socioeconomic status was determined using the social risk index (SRI),²⁹ as described previously.⁶ The SRI provides an indication of social and economic status (range 0-12, with 0 indicating highest status) based on 6 key aspects: family structure, highest education completed by primary caregiver, employment status of primary income earner, occupation of primary income earner, language spoken in the home, and maternal age at the birth of the child. Maternal occupation was converted to an occupational status score developed from the Census of 2006.³⁰ This score ranges from 0-100 with a higher score indicative of higher occupational prestige.

QOL Assessment

The OSA-18, specifically designed to assess QOL associated with SDB, determined health-related QOL (HRQOL).³¹ The items are scored on a 7-point Likert scale anchored by 1 = none of the time; and 7 = all of the time and grouped into 5 domains: sleep disturbance, physical symptoms, emotional symptoms, daytime functioning, and caregiver concerns. A total score less than 60 suggests the child's SDB has a small impact on HRQOL, between 60 and 80 indicates a moderate impact, and greater than 80 indicates a large impact.

The scores from the individual domains and total score at follow-up were subtracted from the scores at baseline to determine the change score. A negative change score indicates a deterioration of HRQOL, whereas a positive change score indicates an improvement.

Download English Version:

<https://daneshyari.com/en/article/6219702>

Download Persian Version:

<https://daneshyari.com/article/6219702>

[Daneshyari.com](https://daneshyari.com)