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Adenotonsillectomy in obstructive sleep apnea syndrome
Proposal of a surgical decision-taking algorithm

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Summary

Objective: The incidence of snoring in the pediatric population is 10% and the incidence of OSAS is equal to 2–3%. Sometimes, primary snoring and OSAS overlap and only polysomnography can differentiate the two disorders but its use is complex, expensive and highly controversial. The purpose of this paper is to demonstrate the value of the clinical assessment associated with the patient's history in selecting children with OSAS and to validate the therapeutic algorithm, thereby employing polysomnography only for selected cases.
Methods: A population of 118 patients was considered, selected by means of a questionnaire that indicated OSAS and a clinical evaluation that confirmed the diagnosis. The studied group underwent clinical assessment complete with fibreoptic survey as well as nocturnal pulse oxymetry, orthodontic and phoniatric evaluation. Regardless of the adenotonsillar size, all the selected children underwent adenotonsillectomy and were evaluated after 3 months with the help of a questionnaire, ORL examination and nocturnal pulse oxymetry.
Results: In all the patients we witnessed the disappearance of apnea. A 80.5% of children benefited from the surgical procedure. A 12.7% continued to present minor symptoms. A 6.8% continued to snore in a discontinuous manner, but without apnea: these children were re-assessed after a further 6 months with nocturnal pulse oxymetry and no oxymetric alteration was demonstrated. There were no significant differences between the degree of upper airway obstruction and the surgical outcome.

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Conclusion: The history and clinical exam are sensitive tools, even though relatively aspecific. Our results confirm the validity of the history and clinical exam as a screening method as well as the role of the surgical procedure that can re-establish the patency of the upper airways and to contrast the neuromuscular hypotonia as a result of the effect of the surgical scar. If it is true that primary snoring and OSAS are a *continuum*, our approach regarding surgery may be defined as a form of prevention regarding a pathology with potential complications. Polysomnography cannot be carried out routinely due to the lack of specialised centres and because of its excessive cost. It is an option to be used only in unsuccessful adenotonsillectomies and for those children who have complicated presentations from the outset.

1. Introduction

In children, the obstructive sleep apnea syndrome (OSAS) is an alteration of the breathing pattern during sleep, characterised by the partial or complete obstruction of the upper airways, that interrupts normal nocturnal ventilation and the normal architecture of sleep [1]. Primary snoring (PS), however, is featured by snoring without obstructive apnea, frequent awakenings during sleep and abnormal pulmonary gaseous exchange [2].

The symptoms correlated with OSAS present various degrees of severity, both during the day and at night. Diurnal symptoms include the alteration of normal behaviour such as more pronounced irritability, attention deficit and poorer performance at school; excessive daytime sleepiness or morning headache are also possible, even though not as common. Conversely, chronic diurnal nasal obstruction, rhinorrhea or hyponasal speech are commonly present.

The nocturnal symptoms are snoring, agitated and discontinuous sleep, apnea, decubitus with hyperextended head, nightmares, diaphoresis, enuresis. In the most severe cases, cardiac and pulmonary complications may be present as well as neurological disorders and poor growth. Approximately 10% of children under 6 years of age are common snorers but do not present OSAS, nor are they predisposed to it [3]. The incidence of OSAS in the pediatric population is 2—3% [4,5].

The natural history of OSAS has not yet been clearly defined even though it is now an accepted tenet of clinical practice that simple snoring is one of the risk factors that indicates the possibility of developing the disease.

The criteria for diagnosis and treatment differ from those of the adult population and, even though there have been attempts to standardise them, these are not universally accepted [6].

The most frequent cause of OSAS in children is adenotonsillar hypertrophy [7—9]. Other causes are nasal obstruction (caused by allergic rhinitis, sinusitis, cystic fibrosis, laryngeal masses, laryngomalacia, tracheomalacia), cleft palate, malformations associated to cranial and facial alterations, neurological or neuromuscular disorders.

Numerous studies have already reported an improvement in snoring and in OSAS following adenotonsillectomy. The first therapeutic step in cases of unresponsive OSAS in children usually is adenotonsillectomy, even in the presence of rather small adenotonsillar sizes, especially in uncomplicated children, i.e. children older than 2 years of age, without pulmonary, neuromuscular, genetic or metabolic diseases or Down's syndrome [10,11].

The presenting symptoms of PS and OSAS often overlap, and only polysomnography (PSG) can determine the presence and severity of nocturnal respiratory disorders and hence differentiate the two diseases. However, there is a long-standing controversy over the need to carry out such a complex and expensive test in all the children that present symptoms that suggest either PS or OSAS [12].

Our approach to OSAS in the pediatric population is primarily based on clinical assessment. Depending on the results of the questionnaire, designed to separate minor from major symptoms, and also depending on the results of the clinical exam, we currently select children with suspect OSAS without other causes of nasal obstruction, malformations, metabolic or neuromuscular diseases who may benefit from an adenotonsillectomy. Polysomnography is carried out only in case of therapeutic failure or in selected children.

The purpose of the paper is to demonstrate the validity of the clinical and medical history assessment to select children with OSAS and to validate the algorithm for the management of surgical options for OSAS, keeping polysomnography for selected cases only.

2. Methods

In the period between January 2000 and December 2003, we assessed 420 consecutive children, who presented to our tertiary hospital with nocturnal