

Grades of Adenoidal Obstruction; a comparison of clinical and radiological assessment

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ABSTRACT

Aim: To determine the frequency of cases in which clinical and radiological findings detect the same grade of adenoidal obstruction in children.

Results: One hundred and fifty children, 115 male and 35 female, aged up to 15 years were enrolled. The clinical symptomatology scores correlated significantly with radiological assessment of nasopharyngeal airway obstruction ($r=0.419$; $p<0.001$). The correlation was significant at radiological assessment of minimal obstruction ($p<0.05$) and severe obstruction ($p<0.001$).

Conclusion: Clinical assessment of adenoidal symptoms in children provides a reasonably reliable assessment of presence and severity of nasopharyngeal airway obstruction. This technique of assessment is easy to use and is particularly valid when obstruction is either mild or severe.

Keywords: Adenoids; adenoidectomy; radiography.

INTRODUCTION

Nasopharyngeal tonsil, commonly known as "adenoids" is situated at junction of roof and posterior wall of nasopharynx forming part of Waldeyer's ring of lymphoid tissue at the portal of upper respiratory tract.¹⁻⁶ Adenoids are present at birth. It shows physiological enlargement up to age of 6 years and then tends to atrophy at puberty and disappear up to age of 20 years.² The pathogenesis of adenoidal enlargement is multifactorial including viral and bacterial upper respiratory tract infection and allergy. In children, enlargement of adenoids is a main causative factor of chronic nasal obstruction. Various tools are available for its assessment including history, radiological and physical examination, rhinomanometry and nasopharyngoscopy.¹⁻⁶ Nasopharyngoscopy is not universally available, it is an invasive and expensive modality.

Rhinomanometry is found to be poorly tolerated in children although clinical assessment is recommended as essential in the preoperative evaluation for adenoidectomy, while plain x-ray of soft tissue nasopharynx lateral view is reported to be reliable for evaluation of degree of nasal obstruction and adenoid size.²⁻⁶ The prevalence of adenoidal enlargement is 5 to 7.5% in all children and peak incidence of adenoid enlargement is in 7 years age group. Clinical symptoms are more common in younger age group due to relatively small volume of nasopharynx and increased frequency of upper respiratory tract infections.^{2,3} The treatment of enlarged adenoids is adenoidectomy.

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METHODOLOGY

A total of 150 diagnosed cases of adenoidal obstruction on x-ray soft tissue nasopharynx lateral view for more than 3 months and up to age of 15 years of either sex were included in the study while those cases with history of previous adenoidectomy and having cleft palate, cleft lip, nasal septum deviations, unilateral or bilateral nasal polyposis on clinical examination despite having adenoidal enlargement on x-ray soft tissue nasopharynx were excluded from the study. The study was completed within period of 16 months. It was started on 1st September 2010 and completed on 31st December 2011. It was a hospital based study conducted at outpatient department of otolaryngology, Services Hospital, Lahore. Patients with adenoid hyperplasia underwent x-ray soft tissue nasopharynx for adenoids lateral view and degree of adenoidal obstruction was assessed and graded into mild, moderate and severe radiologically along with symptomatology score assessed clinically. An informed consent was taken from the parents of each patient. Detailed history of each patient was taken with special regard to presenting complaints such as mouth breathing, snoring, obstructive breathing during sleep and hearing status.

A thorough examination of the ear nose and throat was done. Hearing status of the patient was checked with voice test individually for each ear. Pure tone audiometry was performed to assess the hearing status. Tympanometry was performed to assess the middle ear status objectively. Confounding variables were controlled by strictly following the exclusion criteria. The collected data was analyzed by using SPSS version 17.

RESULTS

The study on patients with adenoidal obstruction was carried out on 150 children aged up to 15 years, out of which 115 were males and 35 were females.

Symptomatology scores is recorded in various age groups (Table 1). Frequency of grades of adenoidal obstruction (assessed radiologically) is presented in Table 2. Table 3 shows radiological grading of adenoidal obstruction according to symptomatology score.

Table 1: Symptomatology score by patient age (in year)

Age(yrs)	Mild	Moderate	Severe	Total
1-3	0	20	0	20
4-6	10	15	30	55
7-9	0	20	35	55
10-13	0	15	5	20
Total	10	70	70	150

Table 2: Frequency of grade of adenoidal obstruction as assessed radiologically radiological grading

	Frequency	%	Cumulative%
Minimal (0.50-0.62)	10	6.7	6.7
Moderate (0.63-0.75)	55	36.7	43.3
Severe (0.760.88)	85	56.7	100
Total	150	100	

Table 3: Radiological grading of adenoidal obstruction by symptomatology score

Symptom atological Score	Radiological Score			Total
	Mild	Moderate	Severe	
Mild	5	5	0	10
Moderate	5	30	35	70
Severe	0	20	50	70
Total	10	55	85	150

DISCUSSION

The authenticity of clinical symptoms for evaluation of adenoidal obstruction in children for prediction of the severity of nasopharyngeal obstruction has been the matter of debate among investigators for a long time. Some of the authors revealed poor correlation between clinical assessment of breathing from mouth and volume of adenoid consequently removed at adenoidectomy⁷ in addition to breathing from mouth and the level of symptomatic improvement followed by non-receipt or receipt of adenonidectomy⁸. While some other studies reveal limited correlation between these^{9,10}.

These less promising results are possibly due to the fact that physical signs and symptoms evaluated in those trials were either not standardized or

not graded. In a study⁷ signs and symptoms were assessed against the volume of removed adenoid during adenoidectomy. The level of nasopharyngeal airway obstruction was found to be more accurate parameter when compared to the actual volume or size of resected adenoids for the assessment of severity of adenoidal obstruction.¹¹⁻¹² Furthermore, some other investigators pointed out substantial correlation between radiological and clinical ratings of extent of nasopharyngeal obstruction, in agreement with the current findings¹³. However in these trials, methods adopted for clinical evaluation of adenoidal obstruction were unlike to the methods used in our study. Another study¹⁵ un-usual signs of adenoidal obstruction (like granular pharyngitis) were also included for the clinical evaluation. In some other studies^{14,15}. Symptoms were not classified. Only one study used grading system of physical symptoms, the clinical evaluation overlooked the nocturnal symptoms of adenoidal obstruction, e.g., obstructive breathing and snoring during sleep¹⁶.

The clinical ratings followed in the current study evaluated the more common and comparatively precise symptoms encountered in cases suffering with adenoidal obstruction in absence of some-other causative nasal pathologies. The categorizing of symptoms reflected a gradual increase in clinical severity of the morbidity. For example, when considering adenoidal obstruction, snoring causing the cases to breathe noisily for both day and sleep time, it become further severe as compared to obstruction causes noisy breathing during sleep time only. The similar consideration was also adopted in cases of mouth-breathing. The allocated score were based on history given by the parents or legal guardian. In case of non-assurance of parents' observations, they were advised to observe their children at occasional intervals during daytime and sleep, for seven days, and then the history was retaken.

In this study, the radiological examination was adopted as the gold standard for authentication of the symptomatology score due to its general availability, acceptance, and noninvasive means of evaluation and the extent of nasopharyngeal airway obstruction. Furthermore, the radiological evaluation is considered to correlate well with the volume and size of adenoid tissue observed or removed during surgery.¹⁷ Considering the advantage of reflection of both nasopharyngeal capacity and adenoidal size, we used the adenoidal-nasopharyngeal ratio parameter in this study.¹⁷ Though, the studies are not definite as to generally accept nasopharyngeal airway, normal size limits of adenoids and the objective criteria adopted for the diagnosis of any pathological enlargement. Our study is similar to the previous

studies with regards to use of classification of degree of nasopharyngeal airway obstruction.¹⁷ A significant correlation between radiological evaluation of nasopharyngeal airway obstruction and symptomatology scoring of adenoidal obstruction in our study agrees regarding the acceptance of symptomatology score. It clarifies that graded evaluation of adenoidal obstruction symptomatology is similar to radiological evaluation in evaluating the severity of nasopharyngeal airway obstruction by enlarged adenoids. The acceptability of symptomatology scoring was fairly good forevaluation of severe obstruction, it was reasonably good for those with minimal obstruction, however, it was poor for moderate obstruction. Similar findings are recorded in another study that compared radiological assessment with clinical signs of adenoidal obstruction¹⁶.

In our study, the radiological assessment and adenoidal symptoms of the degree of nasopharyngeal obstruction were recorded as significantly more severe in children with younger age as compared to the older ones. It agrees with the findings of other researchers^{17,18}. It is found that the adenoids have a comparatively higher growth rate than the nasopharynx between the age group of 2 and 5 years, when the adenoid starts to regress whereas the nasopharynx continues to grow^{19,20}.

CONCLUSION

Clinical assessment of adenoidal symptoms in children provides a reasonably reliable assessment of presence and severity of nasopharyngeal airway obstruction. This technique is easy to use and particularly valid when obstruction is either mild or severe.

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