Main Article

X-RAYS IN THE EVALUATION OF ADENOID HYPERTROPHY: IT'S ROLE IN THE ENDOSCOPIC ERA

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ABSTRACT: ***Objectives:*** *To evaluate the reliability of X-rays in the diagnosis of adenoid hypertrophy and to validate this with flexible nasopharyngoscopy which is the existing gold standard.*
Method: *Lateral radiograph of the neck and a flexible nasopharyngeal endoscopy was done to evaluate adenoid enlargement in children aged 3-12 years who were included in a 8 week randomized double-blind placebo controlled study for the effect of beclomethasone in adenoid hypertrophy. These were graded independently by both the co-investigor and investigator. X-ray and nasal endoscopy for reevaluation of adenoid size was done at the completion of the study. Variables of both the procedures were scored at the beginning and end of the study. The agreement between the two groups was assessed using weighted kappa statistic.*
Results: *There were 26 patients in the study, 17 of them had complete correlation between the X-ray and endoscopy findings. The agreement between these findings was statistically significant (p<.01) with the weighted kappa 0.51.*
Conclusion: *This study shows that lateral X-rays of the neck, besides being a noninvasive procedure, still remains a very reliable and valid diagnostic test in the evaluation of hypertrophied adenoids.*

Key Words: *Lateral neck radiograph, flexible nasopharyngoscopy, reliability, validity*

INTRODUCTION

Adenoidal hypertrophy and its measurement by clinical examination, imaging techniques, and endoscopic evaluation has been reported. Clinical examination of children with nasal obstruction is notoriously unreliable. Anterior rhinoscopy may be normal or show increased secretions, hypertrophy or congestion of the inferior turbinates while in some children posterior rhinoscopy may identify large adenoids.[1] The imaging techniques of the nasopharynx to visualise enlarged adenoids still in use today are X-rays.[2] A lateral radiograph gives a measure of the absolute size of the adenoids and also an assessment of it's relation to the size of airway. The area of the adenoid has been measured by several methods.[3-5] In the study by Jeans et al[5] linear measurement of the palatal airway at the narrowest point between the outlines of the adenoids and soft palate was done and it showed equally good observer correlation and also correlation with the volume of adenoid removed at operation. This is recommended for clinical use.

With the introduction of flexible fibreoptic scope examination of the nasal cavity and nasopharynx in children was made possible. Croft et al[6] used flexible endoscopy to assess the airway of sleep associated upper airway obstruction in infants and young children. Prospective studies of the nasal cavity and nasopharynx in children using the fibreoptic scopy, have shown the size of the adenoid tissue to correlate with the results of tympanometry and radiography as well as with the complaint of nasal obstruction and snoring.[7,8] X-rays in the diagnosis of enlarged adenoid had been less popular by the turn of last century with the advent of flexible nasopharyngoscopy, which is now considered to be the gold standard. The latter test however, has the disadvantage of being an invasive procedure. However, there is a paucity of statistical analysis with the test of significance in these diagnostic tests. Inter- and intra-observer variability with categorical data can be estimated by kappa statistic,[9] as a measure for calculating the degree of agreement between two observers. Since it's introduction the kappa statistic has been used in many medical specialities.[10] This study was thus done to validate X-rays which is an important noninvasive diagnostic test.

MATERIALS AND METHODS

Children aged 3-12 years who presented to ENT / Pediatric outpatient departments at Christian Medical College and Hospital from December 1998 to August 1999 were included in a 8 week randomized double-blind placebo controlled study for the efficacy of beclomethasone in adenoid hypertrophy. Following detailed history the symptoms were graded according to severity. X-ray and a flexible nasal endoscopy of the child was done and the adenoid

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enlargement graded by the co-investigor, and investigator independently. X-ray and nasal endoscopy for re-evaluation of adenoid size was done at the completion of the study (Table 1). The size of the adenoids was graded according to the palatal airway measured from the most convex point of the adenoid tissue to the soft palate, the narrowest distance between the nasopharyngeal soft tissues and the soft palate was taken.[9] Grade 1: >6 mm, Grade 2: 4-6 mm, Grade 3: 0-3 mm.

Nasal endoscopy was done with Olympus Type P3 scope under topical anesthesia using 4% xylocaine with no decongestant . The size of the adenoid was observed and the distance of the adenoid tissue from the vomer was assessed.[10] It was graded as: Grade 1: distance > 1 cm, Grade 2: distance 0.5-1.0 cm, Grade 3: distance < 0.5 cm

Statistical Analysis

Statistical analysis was done using the SPSS/PC+ soft ware. The agreement between endoscopy and X-ray was assessed using weighted kappa statistics.[9,10]

RESULTS

There was good agreement between the X-ray and endoscopy findings. 17 out of 26 patients had complete correlation between the X-ray and endoscopy findings. (Table 1). The observed agreement between endoscopy and X-ray was 17/26 - 65%. The weighted kappa was 0.51($p<0.01$).

DISCUSSION

There have been various studies[6-8] where the adenoid size was graded according to symptoms score, adenoid/choana ratio on nasal endoscopy, etc. In our study in addition to symptom score and endoscopy, lateral cephalometric radiographs were used to measure size of adenoid hypertropy and document the difference in treatment. There was good agreement between the X-ray and endoscopy findings (Figure 1, 2 and Table 1). This statistical analysis with the test of significance in these diagnostic tests has not been previously reported.

Lateral skull radiograph is an noninvasive procedure which is well tolerated by children, unlike a flexible fibroptic scope. In recent years fibroptic scopy has been quoted to have more information about the adenoid hypertrophy than a lateral skull radiograph. Our study has shown that there is a significant relationship between endoscopic and radiological findings of the children.

Table 1: Agreement between X-ray and Endoscopy

	Endoscopy Visit III						Row
	Gr I		Gr II		Gr III		Total
	No	%	No.	%	No.	%	
X-Ray Visit III							
Gr I	3	60	1	20	1	20	5
Gr II	2	33.3	2	33.3	2	33.3	6
Gr III	0	0	3	20	12	80	15
Column Total	5		6		15		26

The observed agreement between endoscopy and X-ray was 17/26 = 65%. The weighted kappa was 0.51 ($P<0.01$)

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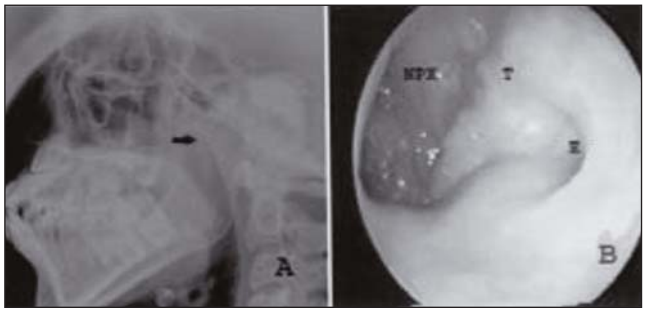

Figure 1: Flexible nasopharyngoscopy showing A- normal nasopharynx, and B- grade 3 adenoid hypertrophy (NPX- nasopharynx, T- torus tubaris, E- eustachian tube orifice, AD- adenoid, NS- nasal septum)

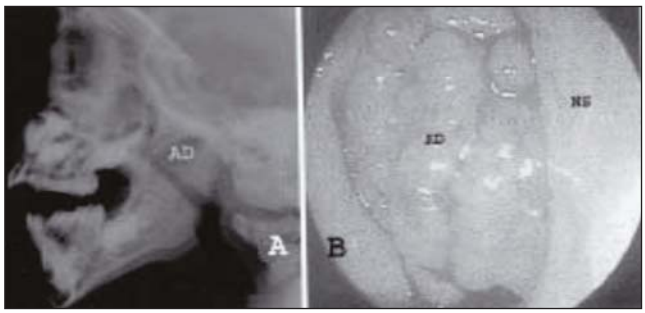

Figure 2: Plain Xray nasopharynx lateral view showing A- normal nasopharynx, B- grade 2 adenoid hypertrophy

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Erratum

The authors of the clinical report "An Unusual Foreign Body (big metallic nut) in the nasopharynx of an Infant" published in the last issue of this journal on page 309 are attached to Calcutta National Medical College, Calcutta and not to PDY Medical College Rajkot as has been erroneously printed. The error is regretted.

- Editor