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COMPARISON BETWEEN RADIOLOGICAL AND ENDOSCOPIC PREOPERATIVE ASSESSMENT OF ADENOIDS

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Abstract

The adenoid hyperplasia is a common problem during childhood. Adenoid is a subepithelial tissue which is located in nasopharynx and is considered as a part of Waldeyer's ring. It has a significant value in immunity as it produces immunoglobulin types IgG, IgA, and IgM. It reaches the peak of its size between 3-8 years of age then starts to regress.

The main purpose of this study is to find the accurate way of pre-operative assessment of adenoids size. Fifty patients aged between 4-10 year were included in this prospective descriptive study, they have a chief complaint of nasal obstruction and snoring. The results of this study showed that endoscopic assessment of adenoids is much superior to radiological one.

Introduction

During childhood, nasal obstruction and mouth breathing are important clinical features which make the parents bring their children to seek medical advice.

Adenoid is a lymphoid tissue in the postnasal space between the roof and posterior wall of the nasopharynx. Furthermore, it is considered as a part of Waldeyer's ring, this ring is a descriptive term for the collection of the subepithelial lymphoid tissue in the upper aerodigistive tract, it includes the adenoid, palatine tonsils, lingual, tubal tonsils, lateral pharyngeal bands, nodules in the posterior pharyngeal wall[1,2].

Willhelm Meyer of Copenhagen, Denmark, described the term of adenoid for nasopharyngeal vegetation in 1870[3].

Waldeyer's ring has a crucial benefits in enhancing secretary immunity and regulating immunoglobulin production[4].

Adenoids are most active between age of 4-10 years and then regression starts. Clinically, adenoid has two broad symptoms; first the symptoms that are related to nasal obstruction which includes mouth breathing, snoring, obstructive sleep apnoea (in severe cases) or rhinorrhea either mucoid or mucopurulent, in addition to post nasal drip and hyponasal speech (rhinolaliaclausia). secondly, the symptoms that is related to hearing impairment due to chronic Eustachian tube dysfunction.

However, general symptoms like mental dullness, nocturnal enuresis, night terrors are also implicated.

On the other hand, the facial features due to adenoid hyperplasia are; pinched nose, flat nasal arch, malar hypoplasia, elongated upper lip, high arched palate, dull 'idiotic' appearance[5].

Investigations are usually performed either through nasal endoscopy or x-ray of the nasopharynx (lateral view of head and neck soft tissue density)[5].

Patients and Methods

This study is a cross-sectional comparative prospective study which was done in January 2016 to January 2017. During this period, 50 patients aged between 4-10 year were presented to the

ENT outpatient clinic in Al-Mawani General Hospital, and a private clinic with a main complaint of nasal obstruction, snoring, and mouth breathing.

A specifically designed paper is used to collect patient's data that included name, age, and gender, with the main symptoms like snoring, mouth breathing, sleep apnoea, and hearing loss.

Adenoid radiological assessment depends on adenoid thickness which is defined as the distance along perpendicular line from the pharyngeal tubercle on the base of the skull to the adenoid convexity[6], this was performed by plain x-ray, lateral view to the post nasal space soft tissue density exposure.

On the other hand, endoscopic adenoid assessment was done by fiberoptic rhinolaryngoscope 2.7 mm in diameter introduced through nostrils till postnasal space to assess the adenoid size by direct vision which is illustrated in a monitor (sometimes, xylociane 2% spray to the was applied in the nasal cavity).

Adenoids was assessed according to specific clinical grading system as follows[7]:

Grade 1: adenoid tissue filling one third of the choanae.

Grade 2: adenoid tissue filling one third – two thirds of the choanae.

Grade 3: adenoid tissue filling from two thirds to nearly complete obstruction of the choanae.

Grade 4: complete choanal obstruction.

The research data was analyzed by SPSS statistical software and the keywords were as follow: The age group between 4-7 years is referred as (0) while age between 8-10 is referred as (1). The other group is sex group : the male is equal to (0), female to (1).

The radiological group as follows: if the adenoid thickness (AT) from 1-1.5 cm it refers as (0) whereas AT more than 1.5-2 cm it refers as (1).

Results

This study included 50 patients for adenoid clinical assessment 4-10 year old.

Table I, demonstrates the distribution of grades according to patient's age group. It appears that grade 3 showed highest frequencies which includes patients with age 4-7 year are 17, 56.67%, while those between 8-10 year old are 13 (56%) with a P-value of 0.064 and there was no statistically significant association between grades and age groups.

Table I: Distribution of grades according to patient's age groups

Patients N=50		Grades				Chi-square	P-value
		I N=1	II N=8	III N=30	IV N=11		
Age group	0 N=30	0(0%)	4(13.33%)	17(56.67%)	9(30%)	4.15	0.064*
	1 N=20	1(5%)	4(20%)	13(65%)	2(10%)		

*Although Grade III showed highest frequencies, but there was no statistically significant association between Grades and age groups.

Table II illustrates the distribution of radiological assessment according to patient's sex. It is found that 21 male patients have AT of 1-1.5cm, while 22 female patients were assumed to be with AT 1.5-2cm (12, 54.55%). The P-value was 0.04% which means statistically significant association between radiological assessment and patient's sex.

Table II: Distribution of R values according to patient's sex

Patients N=50		R		Chi-square	P-value
		0 N=31	1 N=19		
Sex	0 N=28	*21(75%)	7(25%)	4.57	0.04*
	1 N=22	10(45.45%)	12(54.55%)		

*There was statistically significant association between R (0) and patient sex (0)

In Table III, there was statistically significant association between grades and R values. In grade 3 with AT (1-1.5cm),they were 21 patients (67.74%) while in grade 3 AT (1.5-2cm) they were 9 patients (47.37%). In grade 4 with AT (1.5-2cm), they were 10 patients (52.63%).

Table III: Association between Grades and R values.

Patients Radiology N=50		Grade				Chi-square	P-value
		I N=1	II N=8	III N=30	IV N=11		
R	0 N=31	1(3.23%)	8(25.81%)	*21(67.74%)	1(3.23%)	19.40	0.00*
	1 N=19	0(0%)	0(0%)	9(47.37%)	10(52.63%)		

* There was statistically significant association between Grades and R values. Grade III showed highest frequency in R(0).

Discussion

Adenoid is considered as the main acquired cause of nasal obstruction during childhood. It can cause frequent attacks of rhinosinusitis, Eustachian tube dysfunction thus leads to recurrent attacks of acute otitis media, otitis media with effusion and even cholesteatoma formation leading to hearing impairment.

The main challenge in management is the way to assess the postnasal space in children so preoperative adenoid assessment through radiological and endoscopic findings was done in this study.

Edmir et al (2005)[8], compared between radiological and nasopharyngeal endoscopic assessment of adenoid tissue volume in mouth breathing children, they concluded that endoscopic assessment is much more accurate than radiological evaluation of nasopharynx.

Babak saedi et al (2011), found that the different methods of adenoid assessment mainly the radiology and endoscopy are complementary, although the most popular way is nasal endoscopy but still radiology has it's diagnostic importance[9].

Furthermore, Dawood MR, Khamas AH (2017), performed a study to assess the adenoid preoperatively, they estimated that flexible nasopharnygoscopy was more reliable diagnostic tool in the assessment of adenoid size than the lateral nasopharyngeal x-ray[10].

This study found a significant relationship between lateral plain x-ray and nasopharyngoscopy especially in adenoid thickness 1-1.5cm which is correlated with nasopharyngoscopy grade-3. In addition to that, endoscopy has superior benefit in macroscopic findings of the postnasal pathology like exclusion

of congenital masses or vascular lesions, skull base defects ….etc., and give a good idea about nasal cavity like accumulation of mucopurulent secretions, nasal congestion although it is considered as invasive procedure and needs relative cooperation of the child to be performed in the clinic. Meanwhile the radiological assessment is noninvasive technique, but with risk of exposure to radiation. The main advantage of the plain x-ray radiology is that it requires less cooperation and can be done easily to the child for the postnasal space assessment.

In overall, nasopharyngoscopy is the gold standard technique for the assessment of adenoid although there is some role to lateral plain x-ray radiology.

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