

Original Article

Effect of enlarged adenoid in the development of otitis media with effusion under the Age of 12

Raju Barua¹, Kamrul Hassan Tarafder², Mohammad Wakilur Rahman³, Abu Naser Md. Jamil⁴, Farzana Haque⁵, Naseem Yesmin⁶

Abstract

Objective: To find out relation between enlarged adenoid and otitis media with effusion (OME), degree of hearing loss in OME cases with the size of the adenoids and degree of pressure changes in middle ear in OME cases with the size of adenoids.

Method: This Prospective Study was carried out Bangabandhu Sheikh Mujib Medical University, Shahbag, Dhaka and Specialized ENT Hospital of SAHIC, Mohakhali, Dhaka from September 2010 to March 2011 (7 months). Randomly selected 50 children (Age below 12 years) with enlarged adenoid in outdoor & indoor. Patient with sensorineural hearing loss and conductive hearing loss with other than enlarged Adenoids are exclude in this study.

Result: In this study, 58% had hearing loss in which 38% were mild and 20% were moderate loss. 54% of ears had negative pressure. 22 cases of severe adenoids of which 72.72% had OME. 10 out of 16 OME with severe adenoids cases having hearing loss were in 26-40 db range and middle ear pressure is -201 to -400 dapa.

Conclusion: Early diagnosis and treatment of enlarged adenoids should be aparciated to decrease the incidence, morbidity and complications of otitis media with effusion.

Key Words: Enlarged adenoid, Otitis media with effusion (OME)

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1. Junior Consultant, Specialized ENT Hospital of SAHIC, Mohakhali, Dhaka
 2. Professor & Chairman, Department of Otolaryngology Head & Neck Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh.
 3. Assistant Professor, ENT & Head-Neck Surgery Department, City Medical College & Hospital, Gazipur.
 4. Junior Consultant, Specialized ENT Hospital of SAHIC, Mohakhali, Dhaka.
 5. Assistant Professor, Department of ENT-Head & Neck surgery, Medical College for woman and Hospital, Uttara, Dhaka.
 6. Associate Professor, Department of ENT-Head & Neck surgery, Medical College for woman and Hospital, Uttara, Dhaka.

Address of Correspondence: Raju Barua, Junior Consultant, Specialized ENT Hospital of SAHIC, Mohakhali, Dhaka-1212.

Introduction

Enlargement of Nasopharyngeal Tonsil is called Adenoid which may be pathological or physiological. Pathological enlargement of Nasopharyngeal Tonsil was first described by Meyer's in 1870 who called the condition "Adenoids Vegetation"¹.

Nasopharyngeal Tonsil constitutes part of the Waldeyer's ring of the pharynx acting as a police against the entry of inhaled foreign antigen. It is a lymphoid tissue which has a definitive function mainly the production of antibody.

The size of the nasopharyngeal tonsils varies from child to child and also in the same individual as he/she grows². In general, the normal adenoid attains their maximum size between the ages of 3 and 7 years and then

regress³. An acute Upper Respiratory Tract Infection affects the adenoid & results in hyperplasia with enlargement and multiplication of lymphoid follicle⁴. Both infective and allergic episodes are responsible for the causation of adenoids.

As children are not able to express their disability, they are often brought to Otolaryngologist for treatment of nasal obstruction, mouth breathing, snoring, rhinorrhea, sleep disturbance, reduced mental alertness, less physical energy, causing morbidity. Only a few intelligent parents can detect impaired hearing in their children and report to the Otolaryngologist. In children impaired hearing is diagnosed by Otolaryngologist during history taking, clinical examination & investigation of children.

Apparent size of Adenoid is less important than its size relative to the width of the nasopharyngeal space that determine airway obstruction⁵. Posterior rhinoscopy in these cases may be difficult and unreliable⁶.

Radiographic evaluation of the nasopharynx is established as a simple method for determination of the size of the adenoids⁷.

There is close relationship between the adenoids and blockage of Eustachian tube which causes alteration of middle ear function. The function of middle ear is to transmit sound wave from external ear to inner ear by transformer mechanism.

The normal middle ear pressure is -100mm of H₂O to +50 of H₂O and normal middle ear compliance is 0.37 ml to 1.30 ml⁸. Adenoid causes tubal obstruction at its pharyngeal opening. In otitis media with effusion (OME) middle ear pressure usually reduces below -100 mm of H₂O⁹. It is associated with reduction of compliance of middle ear below 0.37 ml & conductive deafness of variable degree¹⁰. Otitis media with effusion may be diagnosed by otoscopy. However this relies on clinical experience & lacks specificity¹¹. Tympanometry provides an effective screening test for detection of otitis media with effusion.

Although the adenoid has long been recognized as a factor in otitis media with effusion, its exact role in the pathogenesis of OME has not been fully elucidated¹².

The major underlying factors responsible for the causation of otitis media with effusion are a combination of Eustachian tube obstruction with superadded infection¹³.

The present study is done to find out the effects of enlarged Adenoids in middle ear function causing otitis media with effusion, so that early diagnosis & treatment of enlarged Adenoids can be encouraged to decrease the actual incidence, morbidity and complication of otitis media with effusion & thus conductive hearing impairment in childhood.

Methods

Prospective Study was carried out Bangabandhu Sheikh Mujib Medical University, Shahbag, Dhaka and Specialized ENT Hospital of SAHIC, Mohakhali, Dhaka. From September 2010 to March 2011 (7 months).

Inclusion Criteria: Children between the age of 3 and 12 years and must have enlarged Adenoids.

Exclusion Criteria: Patient with sensorineural Hearing loss, conductive Hearing loss with other than enlarged Adenoids.

The data was collected by personal interview with the data sheet and examination of ear, nose and throat and radiological and audiological test.

Results

Out of 50, 29 (58%) cases had hearing loss. Among 29 cases, 19 (38%) had mild hearing loss. 54% of ears had negative pressure. Among 22 cases of severe adenoids, 16 (72.72%) had OME. 10 out of 16 OME with severe adenoids cases having hearing loss were in 26 – 40dB range. 10 out of 16 OME with severe adenoids had middle ear pressure in -201 to -400 daPa range.

Table-I
Hearing status of patients (by audiometry) (n = 50)

Status of hearing	Number of patients	Total no. of ears	Distribution of ears	Hearing level in (dB)	Distribution of ears	Percentage of ears
Normal hearing	21	42	42	< 26	42	42
Hearing loss	29	58	38	26 - 40	38	58
			20	41 - 60	20	

Table –II
Pressure change in the middle ear (n = 50)

Middle ear pressure	No of patient	No of ears	Total no of ears with negative pressure (%)	Total no of ears with normal pressure (%)
Bilateral negative	25	50	54	46
Bilateral normal	21	42		
One ear negative another ear normal	4	4		

Table – III
Correlation between sizes of adenoids with incidence of OME (n = 50)

Size of adenoids	No. of Patients	No. of incidence of OME	Percentage of incidence of OME in relation to particular size of adenoids
Mild	7	1	14.28
Moderate	21	12	57.94
Severe	22\	16	72.72

Table IV
Correlation of level of hearing loss with the sizes of the adenoids (n = 50)

Sizes of adenoids	No. of Patients of OME	No. of patients with hearing loss (dB)		
		0-25	26-40	41-60
Mild	1	-	1	-
Moderate	12	-	10	2
Severe	16	-	10	6

Table V
Correlation of middle ear pressure with the size of adenoids (n= 29)

Size of adenoids	No. of patients of OME	No. of patients with amount of middle ear pressure (daPa)	
		-101 to -200	-201 to -400
Mild	1	1	-
Moderate	12	9	3
Severe	16	6	10

Discussion

In this prospective study 50 enlarged adenoids children aged below 12 years have been studied. Emphasis was given on history, clinical examination, radiological and audiological investigations.

The hearing loss found in OME patients with enlarged adenoids was conductive in nature. In this study hearing loss in OME patients range from 26-60dB. 19 cases had mild hearing loss (26-40 dB) and 10 cases had moderate hearing loss (41-60dB). Hearing threshold depends upon the severity of OME and according to a report¹⁴, minimal otitis media with effusion had a hearing threshold of 23dB, moderate otitis media with effusion 29dB and impacted middle ears 34dB. The hearing loss found was conductive in nature. In this series, maximum number of patients had hearing loss between 26–40dB, the mean hearing loss was 33dB, which is nearly consistent with above study.

In the present series, tympanometry were done in both ears of all cases (100% ears). Out of 50 cases, 29 cases showed reduced compliance with flat curve or in some cases negative middle ear pressure. This study is almost nearly consistent with reported study¹⁰.

In the present series adenoids was found to be a possible etiological factor in the incidence of OME. It was also found that there was an increase in the incidence of OME with

the increase in the size of adenoids, as 72.72% with severe adenoids, 54.94% with moderate adenoids and 14.28% of mild adenoids patients suffered from OME.

In 6 out of 16 patients of OME with severe adenoids hearing loss was in the range of 41.60dB. In this study, no patients of OME were found with mild adenoids with a loss of hearing in the range of 41- 60dB. It can be presumed from this study that a higher loss of hearing can occur with severe adenoids.

In this study, 10 out of 16 patients of OME with severe adenoids middle ear pressure were in the range of -201 to -400daPa. And 3 out of 12 patients of OME with moderate adenoids, the middle ear pressure was also found in the range of -201 to -400daPa. But no patient of OME with mild adenoids was found in this range of middle ear pressure. Therefore it can be said that negative middle ear pressure is more in a patient with severe adenoids.

Although this study had been carried out with a limited period of time and with a limited number of patients, yet this may not reflect the overall situations of the society as the patients had been collected from referral centres where patients are referred from different areas of the country.

Conclusion

Enlarged Adenoids and Otitis media with effusion, though these are two clinical

conditions but there is a close relationship exists between them. Adenoid is not always responsible to develop OME but in most OME patients usually have enlarged adenoid.

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