

Impedance Audiometry Findings among Children with Adenoid Hypertrophy in A Tertiary Care Hospital.

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ABSTRACT

Background: The aim of this study is to critically appraise the impedance audiometric findings among children suffering from adenoid hypertrophy. **Methods:** A prospective control study carried out among newly diagnosed cases of adenoid hypertrophy at Department of ENT, BMMSH, Ranchi, a tertiary care Hospital between Nov.2015 to Oct.2016. Impedance audiometric was done on each child of adenoid hypertrophy and each case was considered as a single entity. Type B and C was used as indicator of Otitis Media Externa (OME). **Results:** Data was collected and analyzed using SPSS version 20.100 cases were seen with adenoid hypertrophy and 200 cases were studied for tympanogram. 58 ears had type B tympanogram while 53 ears had type C. The incidence of OME was 55.9%. **Conclusion:** There was more OME affecting both ears with more severe grade of adenoid hypertrophy which established the need for prompt hearing evaluation and management.

Keywords: Adenoid Hypertrophy, Impedance Audiometry, Paediatric patients.

INTRODUCTION

The adenoids are the uppermost part of Waldeyer's ring in pharynx consisting other lymphoid tissues located at superior posterior wall of nasopharynx adjacent to Eustachian Tube opening and choana. Adenoid hypertrophy is commonest disorder in children,^[1] which plays significant role in the pathogenesis of otitis media with effusion,^[2] predisposing delayed speech, language development and poor academic.^[3,4]

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The size of adenoids varies and attains maximum size between age of 3 to 7 years.^[5] The growth of soft tissue of nasopharynx leads to narrowing of nasopharyngeal airway.^[6] Subsequently the growth of nasopharynx increases while the soft tissue remains unchanged.^[7] Chronically infected adenoids act as a reservoir in upper respiratory infections with oedema and obstruction of nasopharyngeal end of Eustachian tube.^[8-10] Enlarge adenoids lead to obstruction of Eustachian Tube leading to negative intratympanic pressure due to absorption of air.^[11,12] Due to chronic infection of adenoid tissue epithelial metaplasia and connective tissue fibrosis occurs which lead to impede the function of Cilia.^[13] There

is increase in mast cells and allergic mediators in adenoid tissues which binds with Immunoglobulin E (IgE) and release histamines and other inflammatory mediators after exposure to allergens.^[14] The released mediators modify the ciliary function and structure and also increase the secretory activity of mucosal cells of middle ear.^[15]

The Eustachian tube dysfunction is most important factor in pathogenesis of Otitis media with effusion.^[16] Obstruction of ET leads to increase middle ear pressure, and due to influx of bacteria and viruses from nasopharynx secondary to adenoid infection causes inflammation, mucosal oedema and increased secretory activity of middle ear mucosa leading to formation of effusion.^[17]

MATERIALS AND METHODS

This is a prospective case-control study carried out among newly diagnosed case of adenoid hypertrophy at Dept. of ENT, BMMSH, Ranchi. The study was carried out between Nov 2015 to Oct 2016. It includes all new cases with clinical and radiological features of adenoid hypertrophy. Exclusion of all patients with previous adenoidectomy, cerebral palsy, ear discharge, cleft palate and congenital ear deformity.

Ethical Clearance was given by our institution and informed consent was taken from parents/guardian of all patients' complete ENT examination was carried out for all patients.

Only new patients having features suggestive of enlarge adenoids on plain radiograph of post nasal space, and adenoid nasopharyngeal ratio (ANR) was measured as proposed by fajiokae et al^[18] and was graded using Sade method (grade 0,I,II,III).^[19] Tympanoplasty was done using auto Tump262 Welch allyn,USA for both ears and each ear was studied as a single entity. Type B and C were used as indicator of OME.

The data was collected in a Performa and analyzed using SPSS version 20 was considered significant and confidence interval was set at 95%.

RESULTS

100 cases of Adenoid hypertrophy were seen with in the study period. They were all with age of 5 to 15

years. There was male predominance (M:F=1.4:1) [Table 1].

The incidence of type B tympanogram was 29.4% while type C was 26.5%, [Table 2]. The incidence of OME was 55.9% [Table 3]. Patient with grade 3 Adenoid hypertrophy were seem to be stastically with occurrence of OME, [Table 4].

Table 1: Age range of the patients.

Age range (years)	Frequency	Percentage
<2	12	11.8
2-4	53	52.9
5-7	24	23.5
8-10	11	11.8
Total	100	100

Table 2: Tympanometric findings in the patients with AH.

Tympanometry	Left ear Frequency	%	Right ear Frequency	%	Both ear Frequency	%
A	47	47.1	41	41.2	88	44.1
B	18	17.6	41	41.2	59	29.4
C	35	35.3	18	17.6	53	26.5
Total	100	100	100	100	200	100

Table 3: Incidence of OME.

	Case	
	Frequency	Percentage
OME	112	55.9
No OME	88	44.1
Total	200	100

Table 4: Association between OME and Grade 3 AH.

	Adenoid Grade 3		df	Value	
	Yes	No			
OME	64	12	1	5.8165	0.02
No OME	16	44			
	80	56			

DISCUSSION

The incidence of otitis media with effusion in patients of adenoid hypertrophy was 55.9% with more of type B (29.4%) than type C (26.5%) type of tympanogram. This establishes significance of adenoid hypertrophy as a risk factor in pathogenesis of otitis media with effusion. This is similar to the findings reported in Enugu by Orji et al.^[20]

A similar report in Kenyatta national Hospital among children aged 1 to 4 years with adenoid hypertrophy at out patient clinic with prevalence of 67.3% using both type B and type C as indicator.^[21]

There was higher proportion of type B tympanogram than type C in this study. It signifies that middle ear effusion occurs more than ET dysfunction among patient of adenoid hypertrophy leading to severe hearing impairment.^[22] The finding was also similar to the finding in Kenya with prevalence of Type B

higher than Type C tympanogram. There was more bilateral cases of Otitis media with effusion as compared to unilateral. Generally the bilateral cases cause more hearing impairment than unilateral cases establishing that patients of adenoid hypertrophy are more at risk of having sequence of otitis media with effusion associated with hearing impairment. All children had adenoid nasopharyngeal ratio measured 59% patients had grade-3 adenoid hypertrophy. This study showed significant association between grade-3 adenoid hypertrophy and otitis media with effusion when compared with other grades of adenoid hypertrophy. This suggests or shows that increasing grade of adenoid hypertrophy is important predictor in establishment of otitis media with effusion in patient with adenoid hypertrophy. Plain radiograph assessment of postnasal space of children with features of adenoid hypertrophy was routinely done although other modalities have been proposed for diagnosis of adenoid hypertrophy such as indirect mirror examination, palpation, endoscopy etc. The role of each modality of diagnosis methods is still controversial and currently there are no comprehensive guidelines for assessing adenoidal enlargement.

CONCLUSION

This study shows high incidence of otitis media with effusion among patients with adenoid hypertrophy with type B tympanogram being more common. There was more bilateral otitis media with effusion than unilateral, The more the sever grade of adenoid hypertrophy showed statistically significant

otitis media with effusion thus being an important risk factor for otitis media with effusion in children.

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