ENLARGED ADENOIDS AND ALLERGY IN OTITIS MEDIA- AN EXPERIENCE AT A TERTIARY CARE HOSPITAL

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ABSTRACT

Objectives: To estimate the incidence and association of allergy in pediatrics with enlarged adenoids and Otitis media with effusion (OME).

Material and Methods: All pediatric patients admitted to the ENT department for adenoidectomy or tympanostomy tube placement with OME were examined for any history of allergic diseases from January 2017 to June 2017. Patients were allocated according to the allergic disease and investigated for allergic rhinitis, asthma and eczema. Details about adenoid was also taken from each patient.

Results: A total of 132 patients were reviewed during study period. Of these, male patients (n=91, 68.9%) were more than female (n=41, 31.1%) with mean age of 6.52 years (±3.8 SD). The most common presenting complaint was ear ache (24.2%). Majority of patients (93.9%) had type B tympanogram. Allergic diseases such as, allergic rhinitis (60%) was commonly observed followed asthma (28.8%) and eczema (15.5%). Adenoid was observed in 103 children and majority experienced nasal obstructions adenoids (37.9%) followed by nasal discharge adenoids (30.3%). A statistically significant association was also observed between allergy and enlarged adenoids in this study ($p < 0.05$).

Conclusion: There was a close relationship of allergy with enlarged adenoids presented with otitis media with effusion.

Keywords: Pediatrics, allergic rhinitis, otitis media, effusion, adenoids.

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INTRODUCTION

Otitis media with effusion (OME) is a frequent otological illness in paediatrics.[1, 2] It is characterized by the existence of middle-ear effusion with symptoms including discharge from ear (otorrhoea), earache (otalgia), irritability and fever.[3] It is reported that, nearly 80% of pediatrics are affected due to OME during their first five years of life span and a global cumulative incidence rate of OME is 10.85% (709 million cases/year) and out of which, 51% occur in pediatrics.[4, 5]

It is evident that pediatrics with allergy are more vulnerable to OME.[6] There are several contributing factors such as, the Eustachian tube (ET), which is responsible for balancing middle ear pressure might become mechanically blocked due to adenoid enlargement or nasal mucosal swelling. A nasal swelling in allergic rhinitis (AR) patients cause ET dysfunction and which ultimately leads to OME.[7,8] Adenoid enlargement may also a reason of ET blockage and then leads to the OME condition. According to the previous published studies, pediatrics with allergic diseases have higher chances of adenoid enlargement than others.[6,9,10]

The most significant factor responsible for the pathogenesis of OME is ET dysfunction.[11] Et obstruction leads to increased pressure in middle ear and invasion of bacteria or viruses from the nasopharynx and caused adenoidal infection. Furthermore, the inflammation, mucosal oedema, and increased secretory activity of the middle ear mucosa, leads to effusion formation.[11,12]

The OME is the most common disease in reported among ENT pediatric department in Pakistani hospitals.[13, 14] According to the previous published studies allergy can be a risk factor for adenoid hypertrophy in pedriatrics.[6, 15] The details about the allergy and its increased incidence in OME or adenoid enlargement remain scarce.[6] These types of data are important for policy makers to understand both the public health burden and the potential economic impact of the disease. However, despite its importance, the detail about allergy in children with enlarged adenoids and OME is poorly explored in our setting. Furthermore, no similar investigations were carried out in selected tertiary care teaching hospital. Therefore, this study

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was carried out to estimate the incidence and association of allergy with enlarged adenoids in otitis media with effusion in pediatrics.

MATERIAL AND METHODS

A prospective cross-sectional study was carried out from January 2017 to June 2017, in a tertiary care hospital, Peshawar, Pakistan. The selected setting was a government funded hospitals and main referral hospitals of selected area. The study was carried out according to the ethical research principles of Helsinki declaration and approved by the Bio- Ethical/Institutional review boards (ERB/IRB) of selected hospitals. A written and oral informed consent was taken from all participants.

All pediatric patients admitted to the ENT department for adenoidectomy or tympanostomy tube placement with OME were examined for any history of allergic diseases during study period. A detailed ENT examination and hearing test was performed by the physician at admission. Portable tympanometer was used to examined each pediatric OME patient. The character of the tympanic membrane was determined as appearance (normal, dull or retracted), presence of fluid in the middle ear and the tympanic membrane color (yellow, grey, blue or amber). A modified Jerger's classification as A, As, B or C were used to interpret tympanometry curve results.[16] The result of no middle ear effusion was interpreted as type A, while type B, type C, and type As as predictive of middle ear effusion. Patients were allocated according to the allergic disease and investigated for allergic rhinitis, asthma and eczema. Details about adenoid was also taken from each patient.

Different statistical tools were applied for the data analysis. Descriptive statistics (like mean, frequency, and percentages) and inferential statistics (like chi-square test) were used to analyze and present data. The analysis was performed by using statistical tool SPSS. v22 (SPSS Inc., Chicago, IL, USA). The statistically significant p value was considered as less than 0.05.

RESULTS

A total of 132 patients were included in this study. Of these, male patients (n=91, 68.9%) were more than female (n=41, 31.1%) with mean age of 6.52 years (±3.8 SD). The most common presenting complaint was ear ache (24.2%) followed by ear blockage (15.2%). The otoscopic and tympanogram findings observed that the position of tympanic membrane (TM) was retracted (76.5%) in most of the patients. Furthermore, about 93.9% (n=124) pediatric patients had type B tympanogram (Table 1).

In this study, 34.1% (n=45) patients suffered from allergy. Of these, allergic rhinitis (60%) was commonly observed followed asthma (28.9%) and eczema (15.5%) (Table 2).

Adenoid was observed in 103 (78%) children and majority experienced nasal obstructions adenoids (37.9%) followed by nasal discharge adenoids (30%). Further details are listed in Table 3.

A statistically significant association was also observed between allergy and enlarged adenoids in this study ($p < 0.05$) (Table 4).

Table 1: OME History and types of tympanometry (n=132)

Variables	outcomes	Frequency & %ages
Blocked Ear	Yes	20(15.2)
	No	112(84.8)
Ear Ache	Yes	32(24.2)
	No	100(75.8)
Position of tympanic membrane	Bulging	12(9)
	Retracted	101(76.5)
	Others	19(14.3)
Type of Tympanometry	Type B	124(93.3)
	Type C	8 (6)

Table 2: Frequency of allergic diseases in pediatric patients

Allergies	Outcomes	Frequency & %ages
Allergy Rhinitis	Yes	25(55.5)
	No	18(40)
Asthma	Yes	13(28.9)
	No	32(71.2)
Eczema	Yes	7(15)
	No	38(84.4)
Total	Yes	45(34.1)
	No	87(65.9)

Table 3: Details about types of adenoids

Adenoids	Outcomes	Frequency & %ages
Nasal obstructions	Yes	39(37.9)
	No	64(62.1)
Nasal discharge	Yes	31(30)
	No	72(70)
X-ray postnasal space	Yes	13(12.6)
	No	90(87.4)
Mouth Breathing	Yes	12(11.6)
	No	92(89.3)
Adenoid Facies	Yes	8(7.7)
	No	95(92.2)
Total	Yes	103(78)
	No	29(22)

Table 4: Association of Allergy and Adenoids in OME

		Adenoids		Total	P-value
		Absent	Present		Fisher Exact test
Allergy	Absent	26(89.7%)	61(59.2%)	87(65.9%)	0.0018
	Present	3(10.3%)	42(40.8%)	45(34.1%)	
Total		29(100%)	103(100%)	132(100%)	

DISCUSSION

Otitis media with effusion (OME) is a common disorder in the pediatric and a common reason of visits to the primary care department. Most of the children with OME recover spontaneously within 3 months and sometimes did not require any medical therapy. However, it is reported that in up to 10% of the children, the exudates will last for a year or even longer and leads to serious consequences.[17] Pediatrics with allergic diseases have higher chances of adenoid enlargement than others and it is evident that pediatrics with allergy are more vulnerable to OME.

Moreover, recurrences of OME are more often present in allergic patients with an enlarged adenoid as compared to non-allergic patients. Allergy is among one of the most disputed factors predisposing to OME. In current study, 34.1% pediatric patients suffered from allergy. The relationship between increased susceptibility to OME and allergic diseases was also highlighted by previous published studies. These findings were supported by the studies conducted in Poland[6] and Japan.[18]

Majority of patients (93.9%) admitted for adenoidectomy with had type B tympanogram. Patients with type B tympanogram was also higher in studies of Adamczyk P et al. (51%)[6] and Varsak YK et al. (56.3%).[9] The observed higher proportion of type B tympanogram in current study means patient with enlarge adenoids experience middle ear effusion problem more than ET dysfunction, which is more related to severe hearing impairment.[11,19] Such type of findings reveals the necessity for prompt hearing assessment and management in patients with enlarge adenoids.[20]

Adenoid enlargement is a common cause of upper-airway obstruction in pediatric patients. About, 78% of pediatric patients experienced enlarge adenoid in this study. Nasal obstruction was the most common symptoms in study population. Similar findings were also reported by Sharifkashani S et al.[21] however, deviated from the study of Maheswaran S et al.[22] which reported that rhinorrhea (nasal discharge) commonly seen in their study population.

This study found a significant association between allergy (e.g. allergic rhinitis) and adenoids in OME pediatric patients and confirms that allergic rhinitis is main form of allergy in children. Studies conducted by Adamczyk P et al.[6], Kreiner-Møller E et al.[23], Tomonaga K et al.[24], Lack G et al.[25], and Bozkurt G et al.[26] also reported similar finding. Previous literature also confirmed the relationship between increased risk of OME and allergic rhinitis pediatric population.[23, 27-29] Therefore, it is crucial to prevent the aggravation of allergic rhinitis by managing risks systematically in order to prevent complications.[29] The evidence based guidelines recommend the usage of intranasal topical steroid drops in OME patients with allergy to reduce the inflammatory response.[30,31]

LIMITATION

The current study had access to well-reported data on frequency of allergy in pediatric with enlarged adenoids in otitis media with effusion and was adequately powered. Some limitation must be acknowledged. Patients were recruited from one hospital hence; findings of this study may not be representative of the entire country. However, these findings add a piece of useful information, particularly around occurrence of allergy with enlarged adenoids in pediatric and enlarged adenoids in pediatric OME population and health care system.

CONCLUSION

There is a strong association between allergic rhinitis and enlarge adenoids in OME pediatric patients

RECOMMENDATIONS

Large number of multicenter studies are also needed to find the accurate rate of allergy in pediatric with enlarged adenoids at national level in Pakistan.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Khan AA: Main idea, Data Collection, Interpretation of Data, Bibliography.

Khan AR: Overall supervision, Final approval.

Muhammad J: Data Collection.

Alam M: Bibliography.

Qasim A: Manuscript writing.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.