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Original Article

To Study the Incidence of Serious Otitis Media in Allergic Rhinitis Patients

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Abstract

Introduction: The prevalence of serious otitis media (SOM) in children with persistent allergic rhinitis (AR) in different countries varies between 82% and 93%. Many risk factors of otitis media with SOM have been studied and proven. However, its association with AR remains controversial.

Aim: The aim of the study was to determine the incidence of SOM in patients with AR.

Methods: It was a cross-sectional study performed in our site hospital from the period of August 2019 to July 2020. A total of 100 patients meeting inclusion criteria were randomly selected from the ENT department of our site hospital for the study. Patients with acute upper respiratory tract infection within a couple of weeks and those with craniofacial malformations or with significant ear wax were excluded from the study.

Results: In our study, women showed a higher incidence of SOM in comparison to men. Patients in the age group of 11–30 years were observed with the highest SOM incidence. SOM with perforation incidence was observed maximum in patients especially in women.

Conclusion: A higher frequency of SOM was found in patients with AR. Therefore, patients having AR should also be screened for coexisting conditions like SOM and should be treated along with AR.

Key words: Allergic rhinitis, Incidence, Otitid media, Otitis media with effusion, Serious ototis media

INTRODUCTION

Allergic rhinitis (AR) affects a large number of children and adults in our community and other parts of the world especially developed countries.[1] It affects millions of people in the world, especially the Caucasian races. Asthma and rhinitis are often coexistent in a majority of patients.[2] Some allergens in the air may produce symptoms throughout the year and these affect children's quality of life.

The nasopharyngo-tubal unit or the "unified airspace" consists of the nose nasopharynx and middle ear.[3] The Eustachian tube (ET) plays a pivotal role in the pathophysiology of diseases related to this region. It is responsible for aeration, clearance, and defense of the middle ear. It stops the traveling of infectious secretions from the naso-opharynx to the middle ear.[4]

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The drainage of secretions from the middle ear is carried out by the mucociliary transport (MCT) system, which is localized in the cartilaginous portion of the ET. The functioning of the MCT system of the ET is enhanced by the surface tension lowering substance, which allows the rolling of the mucus. The periodical opening of the ET fibro-cartilaginous portion prevents the aspiration of inflammatory or infectious secretions from the rhinopharynx. Furthermore, the ET is provided with specific defense mechanisms by antimicrobial substances such as lysozymes and by resident microbial flora which competes with pathogens. The local lymphoid tissue is scattered in the superficial layer of the chorion of the cartilaginous portion and is particularly plentiful around the pharyngeal ostium.[5]

AR causes congestion of mucosa of ET resulting in ET dysfunction which is pivotal to the development of otitis media with effusion (OME) called serious otitis media

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(SOM). SOM is the most frequent cause of hearing loss and delayed speech development in children and adults.[6] SOM may result from multiple factors such as a bacterial infection, poor clearance, local inflammation, or atopy.[7] Many animal studies have proposed a relation between AR inflammation and ET dysfunction. A nasal allergy-induced in rats caused ET congestion and negative pressure resulting in the stoppage of mucociliary clearance.[8] Hence, a link between AR and SOM has been proposed. SOM has a close association with allergic diseases.[9] This warrants an increased awareness of SOM in children with AR. In a study done on children aged 4–14, it was reported that 7.5% of children with AR had OME.[10] In another study, secretions of the middle ear showed a higher number of eosinophils and T-lymphocytes in atopic patients with SOM in comparison with non-atopic individuals.[11] For the management of SOM, intranasal corticosteroids having limited systemic absorption are safer than oral corticosteroids and their use results in quicker resolution of SOM.[12]

The rationale of this research is to determine the frequency of SOM in patients with AR. If we find a high incidence, then in the future children with AR can be screened for OME, and hence they can be treated along with AR.

METHODS

This cross-sectional study was performed in our site hospital from the period of August 2019 to July 2020 after taking prior permission from the ethical committee. A total of 100 patients meeting inclusion criteria were randomly selected from the ENT department of our site hospital for the study. All patients enrolled in the study consisted of 12 children (below age 15 years) of which nine were male and three were female. Patients of either gender having AR, diagnosed at least 1 year ago, were included in the study. The study was explained to patients and guardians of children's then informed consent was obtained.

Patients with acute upper respiratory tract infection within a couple of weeks and those with craniofacial malformations or with significant ear wax were excluded from the study. All cases having AR underwent clinical examination using tympanometry to diagnose SOM as per operational definition.

RESULTS

A total of 100 patients from period of August 2019 to July 2020 were enrolled for study. The age of patients in our study was divided in to 4 age group categories, that is, <10 years, 11–30, 31–40, and 41–50 years. The data showed that maximum incidence of SOM was observed in age group of 11–30 years (37%). AR incidence observed least in <10 years and 41–50 years group (both 12%) [Table 1].

In our study, female patients showed higher incidence of SOM (61%) in comparison to men (39%) [Table 2].

Table 3 depicts the incidences of type of SOM in AR patients. From the data, it can be inferred that female patients showed more incidence of SOM of both type, that is, with perforation and without perforation in comparison to men, whereas incidence of Bulging tympanic membrane (TM) with ear pain type SOM was observed in men more than in women. While evaluating incidence in children's, it was found that SOM with perforation was observed in eight children's whereas SOM without perforation and Bulging TM with ear pain was observed in two children's in both cases.

DISCUSSION

AR is a long-standing disease in which there is an allergic hypersensitivity response of the upper airways to allergens in the air. Coexistent morbidities in patients with AR include asthma, rhinosinusitis, SOM, and sleep disturbance.[13] Studies on the pathogenesis of SOM have pointed to an interplay between infection, allergy, and ET dysfunction.[14] A study was done by Martines *et al.* in two groups of children (atopic and non-atopic) revealed that atopic children are more likely to develop OME and to have worse hearing loss than non-atopic children's.[15]

Table 1: Age distribution with frequency of SOM

Age group	Frequency
<10	12
11–30	37
31–40	29
41–50	12

SOM: Serious otitis media

Table 2: Gender distribution and frequency of SOM

Gender	Frequency
Male	39 (9 children's)
Female	61 (3 children's)

SOM: Serious otitis media

Table 3: Incidence of SOM in AR patients

Incidence	Males	Females	Children
SOM with perforation COM	14	25	8
Bulging TM with ear pain	6	3	2
SOM without perforation	10	30	2

SOM: Serious otitis media, TM: tympanic membrane, COM: Chronic otitis media, AR: Allergic rhinitis

In our study, patients from age ranging from 10 to 50 years were analyzed and patients in the age group of 11–30 years showed the maximum incidence of SOM (37%) whereas patients with age of 10 years showed the least incidence of SOM (12%). The findings in our study are in contradiction to the study done by Norhafizah *et al.* where the maximum incidence of SOM was observed in the age group of 4–8 years of age (53.8%) and least in the age group of 14–18 years (12.3%).[16]

Female patients in our study showed more incidence of SOM (61%) than men (39%) which is in accordance with the study done by Riaz *et al.*, in which female patients observed 54.8% SOM incidence and men observed 45.2%.[17]

Analyzing the incidences of types of SOM in all patients, it was found that SOM with perforation chronic otitis media was observed maximum (47%), followed by SOM without perforation (42%). The women showed maximum incidences of both SOM with or without perforation in comparison to men. These findings are in accordance with various clinical studies done for SOM.[18]

CONCLUSION

As per the findings of this study, there is a high prevalence of SOM in AR patients. Hence, the cases of AR should also be screened for co-existing conditions like SOM and should be treated along with AR.

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