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Original Research Article

Correlation of sinonasal polyposis with chronic suppurative otitis media

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ABSTRACT

Background: Aim of the study was to assess correlation of sinonasal polyposis with CSOM. To see the role of lignocaine nebulisation and to compare its role with use of steroids and bronchodilators alone in post bronchoscopy patients.
Methods: In the present study, 50 patients of sinonasalpolyposis were subjected to otoscopic, microscopic examination of tympanic membrane findings and tuning fork tests were performed. Pure tone audiometry (PTA) was also done in all patients. High resolution computed tomography (HRCT) of temporal bones and computed tomography (CT) of paranasal sinuses were used to assess otological and sinonasal pathology.
Results: Out of 50 patients, males were 26 and females were 24. Age group 11-20 years had 8 males and 8 females, 21-30 years had 5 males and 7 females, 31-40 years had 11 males and 8 females and 41-50 years had 2 males and 1 female. Left side was involved in 6, right in 9 and both sides in 10 patients. Swab cultures revealed pure aerobic isolates in 16, mixed aerobic and anaerobic isolates in 10. Micro-organisms were staphylococcus aureus in 10, Pseudomonas aeruginosa in 6, *Streptococcus spp.* in 5, *Peptostreptococcus* in 3 and *Bacteroides* in 2 cases. The difference was significant ($p<0.05$). Out of 50 Sinonasal polyp patients, 26 (52%) had CSOM. Type identified was tubotympanic in 12 and atticoantral in 14. There was positive pearsoncorrelation of CSOM with sinonasal polyp (r value of 0.92, p value 0.021).
Conclusions: In the present study there was positive correlation of sinonasal polyposis with CSOM. The prevalence rate was 26%. Micro-organisms were *Staphylococcus aureus, Pseudomonas aeruginosa, Streptococcus spp., Peptostreptococcus* and *Bacteroides*.

Keywords: Sinonasal polyp, CSOM, Bacteria

INTRODUCTION

A sinonasal polyp is an oedematous mucous membrane which forms a pedunculating process with a slim or a broad stalk.[1,2] These are the benign growths of the nasal and sinus mucosa. They originate in the upper part of the nose around the openings to the ethmoidal sinuses.[3] The polyp extends into the nasal cavity from the middle meatus resulting in nasal blockage and restricted airflow to olfactory region. The mucosa of nose is continuous with the mucosa of middle ear through eustachian tube, thus influencing the middle ear and mastoid.[4]

Chronic suppurative otitis media is the chronic inflammation of the middle ear and mastoid cavity, which presents as recurrent ear discharge or otorrhea through a tympanic membrane perforation.[5,6] The pathogenesis of CSOM has been related to the presence of prior or concurrent nasal disease. Chronic infections of the nose and paranasal sinuses (PNS) can involve the Eustachian tube leading to its dysfunction.[7,8] In this study we evaluated the number of patients developing CSOM

after sinonasal polyposis and the type of CSOM occurring in these patients.

METHODS

Study type, place and duration

Presented study was a prospective study, conducted at Government Medical College, Jammu, from June 2022 to January 2023.

Selection criteria

The participants included fifty patients with sinonasalpolyposis aged 15 years and above attending ENT OPD SMGS Jammu. Ethical clearance was obtained from institutional ethical committee. The confirmed cases of sinonasal polyposis aged 15 years and above and those who were willing to participate and gave their years, pregnant and disabled patients and patients with immune deficiencies, liver and kidney diseases were excluded.

Procedure

All patients were subjected to detailed examination such as general physical examination, examination of ear, nose and throat. Otoscopic, microscopic examination of tympanic membrane findings and tuning fork tests were performed. In patients with active CSOM which showed presence of discharge, the discharge was sent for culture. Pure tone audiometry (PTA) was also done in all patients. High resolution computed tomography (HRCT) of temporal bones and computed tomography (CT) of paranasal sinuses were used to assess sinonasal pathology.

A rigid diagnostic nasal endoscopy (DNE) was performed in all patients to evaluate the presence or absence of sinonasal pathology. Results of the study were compiled and assessed statistically using Mann Whitney U test with the level of significance set below 0.05.

RESULTS

Out of 50 patients, males were 26 and females were 24. Age group 11-20 years had 8 males and 8 females, 21-30 years had 5 males and 7 females, 31-40 years had 11 males and 8 females and 41-50 years had 2 males and 1 female (Table 1).

Table 1: Distribution of patients based on age and gender.

Age group (years)	Male	Female
11-20	8	8
21-30	5	7
31-40	11	8
41-50	2	1

Left side was involved in 6 patients, right side was involved in 9 patients and both sides were involved in 20 patients. Swab cultures revealed pure aerobic isolates in 16, mixed aerobic and anaerobic isolates in 10. Micro-organisms were *Staphylococcus aureus* in 10, *Pseudomonas aeruginosa* in 6, *Streptococcus spp.* in 5, *Peptostreptococcus* in 3 and Bacteroides in 2 cases. The difference was significant ($p<0.05$) (Table 2).

Table 2: Assessment of parameters.

Variables	Number	P value
Side		
Left	7	0.72
Right	9	
Both	10	
Swab cultures		
Pure aerobic isolates	16	0.05
Mixed aerobic and anaerobic isolates	10	
Microorganisms		
Staphylococcus aureus	10	0.21
Pseudomonas aeruginosa	6	
Streptococcus spp.	5	
Peptostreptococcus	3	
Bacteroides	2	

Out of 50 sinonasal polyposis patients, 26 (52%) had CSOM (Table 3).

Table 3: Prevalence of CSOM.

Sinonasal polyp	CSOM	Percentage
50	26	52%

Type identified was tubotympanic in 12 and atticoantralin 14 (Table 4).

Table 4: Types of CSOM.

Type	Number	P value
Tubotympanic	12	0.95
Atticoantral	14	

There was positive pearson correlation of CSOM with sinonasal polyp (r value of 0.92, p value 0.021) (Table 5).

Table 5: Correlation of CSOM with sinonasal polyp.

R value	P value
0.92	0.021

DISCUSSION

The first step in the diagnosis of chronic suppurative otitis media is to understand its underlying pathology and once underlying pathology is identified it is easy to offer

treatment for the disease.[9,10] Identification and understanding of nasopharyngeal and sinonasal pathology predisposing to chronic ear disease help in successful management of the ear condition.[11,12] In this study we evaluated the number of patients developing CSOM after sinonasal polyposis and the type of CSOM occurring in these patients.

Our results revealed that out of 50 patients, males were 26 and females were 24. Age group 11-20 years had 8 males and 8 females, 21-30 years had 5 males and 7 females, 31-40 years had 11 males and 8 females and 41-50 years had 2 males and 1 female. Sonawale et al found that out of 67 (49.26%) right ears; 48 (71.64%) had active stage of disease and out of 69 (50.74%) left ears; 53 (76.81%) had active disease.[13] Out of 48 right and 53 left aural bacterial swab cultures, 27 (58.25%) right ear swabs and 30 (56.80) left ear swabs revealed pure aerobic isolates and 18 (37.5%) right ear swabs and 19 (35.85%) left ear swabs had mixed aerobic and anaerobic isolates. Most common microorganisms being isolated were *Staphylococcus aureus, Pseudomonas aeruginosa and Streptococcus spp. Peptostreptococcus* and *Bacteroides*. The prevalence rate of sinonasal disease was 59 (51.30%). These patients were having co-existing sinonasal disease and out of these 59 cases; 46 (77.97%) patient showed direct correlation with CSOM. In these 46 patients, 23 (50%) had chronic bacterial rhinosinusitis showing presence of common pathogens in corresponding aural and nasal swab cultures.

Our results revealed that left side was involved in 6, right in 9 and both sides in 10 patients. Swab cultures revealed pure aerobic isolates in 16, mixed aerobic and anaerobic isolatesin 10. Micro-organisms were *Staphylococcus aureus* in 10, *Pseudomonas aeruginosa* in 6, *Streptococcus spp.* in 5, *Peptostreptococcus* in 3 and *Bacteroides* in 2 cases. Fujita et al reported in their study that 78% patients had abnormal sinuses and rhinosinusitis was present in 48% of cases of refractory otitis media and concluded that in cases of chronic otitis media refractory to treatment the main focus of pathology/infection is in the paranasal sinuses.[14]

Out of 50 sinonasal polyp patients, 26 (52%) had CSOM. Type identified was tubotympanic in 12 and atticoantral in 14. There was positive Pearson's correlation of CSOM with sinonasal polyp. Bluestone and his colleagues studied 40 patients of chronic otitis media and found eustachian tube dysfunction to be the reason for the persistence of the disease.[15] They concluded that diseases of the sinuses as the main cause for eustachian tube dysfunction.

Miura and Takashi studied the influence of upper respiratory infection including rhinosinusitis on tubal compliance in children and adolescents with chronic otitis media and they concluded that 72% of patients with refractory tubal compliance due to chronicity of upper respiratory infection including rhinosinusitis lead to persistence of otitis media.[16]

The limitation was the patients less than 15 years of age were not included in the study.

CONCLUSION

There was positive correlation of sinonasal polyposis with CSOM. The prevalence rate was 26%. Micro-organisms were *Staphylococcus aureus, Pseudomonas aeruginosa, Streptococcus spp., Peptostreptococcus* and *Bacteroides*. The study concludes that nasal diseases particularly nasal polyps are the precipitating factors for chronic suppurative otitis media so every case of CSOM should have through examination of nose and PNS to rule out sinonasal pathology.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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