

PREVALENCE OF SINONASAL DISEASE IN PATIENTS WITH MUCOSAL TYPE OF CHRONIC OTITIS MEDIA

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ABSTRACT

BACKGROUND

Chronic Suppurative Otitis Media is one of the commonest disease encountered in ENT practice. Eustachian tubal dysfunction and sinonasal diseases usually co-exist with the middle ear cleft disease with a variable incidence depending on different demographic strata.

MATERIALS AND METHODS

150 patients attending a tertiary hospital attached to medical college were included in the study. Demographic details, clinical presentation, otoscopy findings and audiological evaluation were done. The data was analysed using standard statistical methods.

RESULTS

Present study included 61% males and 39% females out of 150. CSOM was prevalent in patients from rural areas (90%). It was prevalent among housewives followed by students and manual labourers. 68% of the patients had unilateral hearing loss. 56.7% of the patients complained of nasal discharge. 23.3% of the patients complained of postnasal drip. Allergic symptoms were present only in 7% cases.

DISCUSSION

The study revealed that maximum number of cases were in the age group 20–29 years (27.3%). Youngest case in our series was 13 years old and the eldest was 79 years old. Ear discharge was the commonest complaint in patients with COM mucosal disease (99.3%). Many other studies were compared to the present study.

CONCLUSION

CSOM is more prevalent in the age group 20-29 years. There is a slight female preponderance. The burden of the disease is borne by the rural population. In majority of cases chronic suppurative otitis media is unilateral. Sinonasal disorders are common in patients with COM mucosal disease.

KEYWORDS

CSOM, Sinonasal Diseases, Deviated Nasal Septum, Conductive Deafness, Tubotympanic.

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BACKGROUND

Chronic suppurative otitis media is one of the most frequently encountered diseases in ENT. CSOM affects over 300 million individuals over the globe of which 60% suffer from significant hearing loss. Over 90% of the burden is borne by countries in South East Asia, Western Pacific and Africa. Chronic suppurative otitis media is the chronic inflammation of the middle ear cleft.¹ It is characterised by persistent discharge from the middle ear through a tympanic membrane perforation. Chronic suppurative otitis media can be of 2 types, Tubotympanic disease (mucosal) and Atticoantral (squamosal) disease. Tubotympanic disease

(mucosal) is a benign type of chronic suppurative otitis media involving anteroinferior part of middle ear cleft (Eustachian tube and Mesotympanum).¹ The mucosal type of chronic suppurative otitis media is usually associated with co-existent sinus and nasal pathology which can worsen middle ear problems due to eustachian tube dysfunction. Middle ear cleft is a continuous airspace contained in bone lined by epithelium and in continuity with the atmosphere at the nose, nasopharynx.^{2,3} World health organisation defines chronic suppurative otitis media⁴ as a stage of ear disease in which there is chronic inflammation of middle ear cleft with tympanic membrane perforation and discharge and qualifies Otorrhoea to be present for two weeks or longer. India is among the highest (>4%) prevalence group.⁵ In India, the overall prevalence is 46 and 16 per 1000 in rural and urban population respectively. Individuals in 41-80 age groups were twice as likely to have chronic otitis media as those in age 18-40 age group. Rhinosinusitis affects over 30 million individuals globally each year.⁶ Sinusitis causes inflammation of the middle ear mucosa with increased and persistent mucoid/mucopurulent discharge and causes active mucosal disease.^{7,8} Sinusitis is the significant aetiological factor for middle ear disease of COM – active mucosal type and treating

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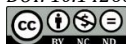
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sinusitis by FESS in subjects result in the good outcome of disease clearance.⁹ Chronic otitis media active mucosal disease patients with coexisting active sinusitis have a chronically persistent ear discharge. In this study, attempt has been made to find out the prevalence of sinonasal disorders like deviated nasal septum, rhinosinusitis and nasal polyps in patients with CSOM - TTD who attended the outpatient Department of ENT, Government Medical College, Thiruvananthapuram, during the period of April 2014 to March 2015.

MATERIALS AND METHODS

The present study was a cross sectional, hospital based study. The study was conducted in the Department of ENT, MCH, and Thiruvananthapuram. The study population consisted of patients with Chronic Suppurative Otitis Media, Tubotympanic variety. The period of study was for 1 year from April 2014 to March 2015.

Inclusion Criteria

1. All Patients with Chronic Suppurative Otitis Media – Tubotympanic Disease (Both unilateral and bilateral)
2. Patients aged between 12 years and 60 years.

Exclusion Criteria

1. Patients with traumatic perforation of the Tympanic membrane.
2. Patients with Chronic suppurative Otitis media-Atticoantral disease.
3. Patients aged below 12 years and above 60 years. Sample size calculated using Stat calc utility of Epi-info software with expected frequency set at 67% and worst acceptable at 60%. Sample size was found to be 150. Informed consent was taken from all patients and from the guardian in case of children. Institutional ethical clearance certificate was obtained. A pre-designed proforma was used to record relevant information from patients selected. Sociodemographic variables like age, sex, occupation, socioeconomic status were noted. A detailed history was taken from all patients and then systemic and general examinations were carried out followed by ENT examination. Sinonasal diseases like rhinosinusitis, nasal polyps, deviated nasal septum and allergic rhinitis were specifically looked for. Tuning fork tests were done, pure tone Audiometry, X-ray both mastoids, X-ray PNS Waters’ view; Otoscopic examination and examination under microscope were performed in all the patients. Complete Haemogram and Diagnostic nasal endoscopy were done. CSOM was defined as a case of chronic suppurative otitis media with Tubotympanic disease where mucosal lining of anteroinferior part of middle ear cleft (Eustachian tube and Mesotympanum) was involved. Sinonasal diseases were defined as 1. Allergic rhinitis. 2. Deviated nasal septum. 3. Rhinosinusitis. 4. Nasal polyposis. Data was be entered in excel spread sheets and will be analysed using appropriate statistical software (Epi-info/ SPSS).

RESULTS

Among the 150 patients included in the present study most common age group was 20-29 years of age (27.3%). Others were 18% in 10-19 years, 24% in 30-39 years, 13.3% in 40-49 years, 11.3% in 50-59 years, 5.3% in 60-69 years and 0.7% above 70 years of age (Table 1).

Age	Count	Percent
10 – 19	27	18.0
20 – 29	41	27.3
30 – 39	36	24.0
40 – 49	20	13.3
50 – 59	17	11.3
60 – 69	8	5.3
70 – 79	1	0.7
Mean±SD	33.5±14.6	

Table 1. Distribution According To Age

150 Patients studied included 61% males and 39% females (Table 2).

Sex	Count	Percent
Male	58	38.7
Female	92	61.3

Table 2. Distribution According to Sex

According to the present study, CSOM is more prevalent among housewives followed by students and manual labourers (Table 3).

Occupation	Count	Percent
Manual Labourer	36	24.0
Housewife	56	37.33
Professional	3	2.0
Student	37	24.67
Others	18	12.00

Table 3. Distribution According to Occupation

Present study shows CSOM is more prevalent in rural areas (Table 4).

Place of Residence	Count	Percent
Rural	135	90.0
Urban	15	10.0

Table 4. Distribution According to Place of Residence

Among the 150 patients, one patient did not have history of ear discharge. Bilateral disease was found in 25.3% of cases studied. Present study showed that unilateral ear discharge is more common than bilateral in patients with CSOM (Table 5).

Ear Discharge	Count	Percent
No Ear Discharge	1	0.7
Unilateral Ear Discharge	111	74.0
Bilateral Ear Discharge	38	25.3

Table 5. Distribution According to History of Ear Discharge

68% of the patients studied had unilateral hearing loss. (Table 6).

Hearing Loss	Count	Percent
No Hearing Loss	14	9.3
Unilateral Hearing Loss	102	68.0
Bilateral Hearing Loss	34	22.7

Table 6. Distribution According to History of Hearing Loss

56.7% of the patients studied complained of nasal discharge (Table 7).

Nasal Discharge	Count	Percent
No Discharge	85	56.7
Discharge Present	65	43.3

Table 7. Distribution According to Nasal Discharge

In the present study, 38.7% of patients had unilateral nasal obstruction while 6.7% had bilateral nasal obstruction. 54.7% of patients had no complaints of nasal obstruction (Table 8).

Nasal Obstruction	Count	Percent
No Nasal Obstruction	82	54.7
Unilateral Nasal Obstruction	58	38.7
Bilateral Nasal Obstruction	10	6.7

Table 8. Distribution According to Nasal Obstruction

23.3% of the patients complained of postnasal drip (Table 9).

Postnasal Drip	Count	Percent
Absent	115	76.7
Present	35	23.3

Table 9. Distribution According to Postnasal Drip

Allergic symptoms were present only in 7% cases (Table 10).

Symptoms of Allergy	Count	Percent
Present	10	7
Absent	140	93

Table 10. Distribution According to Symptoms of Allergy

Bilateral ear discharge was seen in 38 patients of which 37 patients had bilateral perforation and one patient had otitis externa on one side. In the present study, 75% of the patients had unilateral perforation while 24.7% had bilateral perforation (Table 11).

Central Perforation	Count	Percent
Unilateral Perforation	113	75.3
Bilateral Perforation	37	24.7

Table 11. Distribution According to Central Perforation

In the present study, only 38.67% patients had dry ear (Table 12).

Activity	Count	Percent
Active	92	61.33%
Inactive	58	38.67%

Table 12. Distribution According to Activity

Anterior rhinoscopy examination showed septal deviation in 36.67% of the patients studied. Nasal discharge was seen in 3.33% of cases.

Nasal polyps were seen in 0.67% (Table 13).

A/R	Count	Percent
Normal	89	59.33
Septal Deviation	55	36.67
Nasal Polyps	1	0.67
Nasal Discharge	5	3.33

Table 13. Distribution According to A/R

Tuning fork test showed unilateral conductive hearing loss in 65.3% and bilateral conductive hearing loss in 33.3% of the patients studied. But only 24% patients had bilateral perforation. Other hearing loss cases may be due to ossicular fixation or otitis media or retracted tympanic membrane (Table 14).

Tuning fork Test	Count	Percent
Normal	2	1.3
Unilateral CHL	98	65.3
Bilateral CHL	50	33.3

Table 14. Distribution According to Tuning Fork Test

According to the present study, PTA showed that 64.7% had unilateral conductive hearing loss, 30.7% had bilateral conductive hearing loss, 4.0% had bilateral mixed hearing loss. Some of the patients with unilateral perforation showed bilateral hearing loss; this disparity is probably due to Ossicular fixation or retracted tympanic membrane (Table 15).

PTA	Count	Percent
Normal	1	0.7
Unilateral CHL	97	64.7
Bilateral CHL	46	30.7
Bilateral Mixed Hearing Loss	6	4.0

Table 15. Distribution According to Pure Tone Audiogram

According to the present study, DNE showed deviated septum in 36.7%, nasal polyp in 3.3% and discharge in meatuses in 6% (Table 16).

DNE	Count	Percent
Normal	86	57.3
Deviated Nasal Septum	50	33.3
Nasal Polyps	2	1.3
Discharge in Meatuses	7	4.7
Deviated Nasal Septum & Nasal Polyps	3	2.0
Deviated Nasal Septum & Discharge in Meatuses	2	1.3

Table 16. Distribution According to Diagnostic Nasal Endoscopy

X-ray PNS showed deviated nasal septum in 28% (26.67%+1.33%) of patients and haziness in sinuses in 9.33% (8%+1.33%), (Table 17).

X-ray - PNS	Count	Percent
Normal	97	64.00
Deviated Nasal Septum	40	26.67
Haziness in Sinuses	11	8.00
DNS and Haziness in Sinuses	2	1.33

Table 17. Distribution According to X-ray - PNS

Bilateral cellular mastoid was seen in 40.0%, unilateral sclerotic in 35.3% and bilateral sclerotic in 24.7% of the patients studied (Table 18).

X-Ray - Mastoid	Count	Percent
Bilateral Cellular	60	40.0
Unilateral Sclerotic	53	35.3
Bilateral Sclerotic	37	24.7

Table 18. Distribution According to X-ray - Mastoid

In the present study after considering anterior rhinoscopy examination, X-ray PNS, diagnostic nasal endoscopy and haemogram, the following results were obtained (Table 19).

	Count	Percent
Sinonasal Diseases	74	49
No Sinonasal Diseases	76	51

Table 19. Sinonasal Diseases in CSOM

In the present study, the distribution of sinonasal diseases was analysed and found that absence of sinonasal disease was observed in 50.7% of the patient's treated for CSOM. Septal deviation was found in 32% of the cases (Table 20).

	Count	%
No Sinonasal Diseases	76	50.7
Deviated Nasal Septum	48	32.0
Nasal Polyps	2	1.3
Sinusitis	8	5.3
Allergic Rhinitis	8	5.3
Deviated Nasal Septum, Nasal Polyps	2	1.3
Deviated Nasal Septum, Sinusitis	3	2.0
Deviated Nasal Septum, Allergic Rhinitis	1	0.7
Sinusitis, Allergic Rhinitis	1	0.7
Deviated Nasal Septum, Nasal Polyps, Sinusitis	1	0.7

Table 20. Distribution of Sinonasal Diseases

Among the 150 patients, CT scan of Nose and PNS were taken in 78 patients as the disease suspicion was high in them. The analysis of CT scan pictures showed Deviated nasal septum in 32 (41%), Pansinusitis in 16 (20.5%), Isolated Maxillary sinusitis unilateral in 08 (10.25%), bilateral in 12 (15.38%) and normal in 10 (12.8%) patients.

CT Scan PNS	Count	Percent
Normal	10	12.8
Deviated Nasal Septum	32	41.0
Pansinusitis	16	20.5
Isolated Maxillary sinusitis- unilateral	08	10.25
Bilateral Maxillary sinusitis	12	15.38

Table 21. Showing the CT Scan Findings of Nose & PNS (n=78)

DISCUSSION

Otitis media is an important and a highly prevalent disease of the middle ear and poses serious health problem worldwide. The pathogenesis of CSOM has been related to the presence of sinonasal diseases. Infection of the nose and paranasal sinuses can cause eustachian tube dysfunction which in turn can cause CSOM. The present study was undertaken to evaluate the correlation between sinonasal pathology and CSOM. The study included 150 consecutively selected patients with chronic suppurative otitis media (COM - mucosal disease) who attended the Department of ENT,

Medical College Hospital, Thiruvananthapuram during the study period of 1 year from April 2014 to March 2015. In the present study, an attempt was made to identify the prevalence of sinonasal diseases in patients with COM mucosal disease. The study revealed that maximum number of cases was in the age group 20-29 years (27.3%). Youngest case in our series was 13 years old and the eldest was 79 years old. This coincides with a similar study analysis of Sinonasal, pharyngeal and allergy-related risk factors for chronic suppurative otitis media conducted by Ferhat Bozkus, Nazim Bozan et al where the average age was 21.3±8 years.¹⁰ In another study conducted by Dayasena¹¹ et al, most common age group was found to be 31-40 years. In our study, there was a female preponderance (61.3%). This coincides with Karan Sharma, Mridu Manjari et al¹² (Male female ratio 1:1.2). In another study by Rakesh Saboo, Amit Modwal et al¹³ on Tubotympanic CSOM, majority of patients belonged to the age group 21-30 yrs. In the study by Rakesh Saboo, Amit Modwal et al¹³ on Tubotympanic CSOM also there was slight female preponderance. This study shows CSOM to be more prevalent among rural population (90%). Ear discharge was the commonest complaint in patients with COM mucosal disease (99.3%). 25.3% patients complained of bilateral ear discharge. Study conducted by Rakesh Saboo et al¹³ showed 84% patients with complaints of otorrhoea. In our study, complaints of hearing loss were present in 90.7% cases. In the study conducted by Rakesh Saboo et al,¹³ 70% of patient had complaints of hearing loss. In the present study, complaints of nasal discharge were present in 43.3% patients. In the study conducted by Ferhat Bozkus, Nazim Bozan, Ismail Iynen et al,¹⁰ 27.02% of COM patients complained of nasal discharge. In a study by Prempal Singh et al and Shrestha et al,^{14,15} nasal discharges were seen in 26%. In our study, nasal obstruction was present in 45.4% (Unilateral in 38.7% and bilateral in 6.7%). In the study conducted by Prayaga N Srinivas Moorthy et al,¹⁶ nasal obstruction was the commonest nasal symptom. 23.3% patients complained of postnasal drip in our study. The study by Ferhat Bozkus, Nazim Bozan et al¹⁰ had 32.43% with complaints of postnasal drip. In the study by Prayaga N Srinivas Moorthy et al,¹⁶ postnasal drip was complained by 35% patients. Allergic symptoms were present in 6.7% of the patients studied. In a study conducted by Settupane RA,¹⁷ allergic symptoms were present in 17% of the patients. In a study conducted by Prayaga N Srinivas Moorthy et al,¹⁶ 15% of the patients had sneezing as a complaint. Otological examination revealed bilateral perforation in 37 patients (24.7%) in this study. In the study conducted by Shrestha B L, Amatya R C M et al,¹⁸ bilateral perforation was found only in 6.1% of cases. In the study conducted by Nishant Kumar, Devashri Chilke et al¹⁹ bilateral involvement was found in 28%. This is in accordance with our study. In our study, there were 92 patients with active ear (61.33%) but 68% of patients had dry ear. In the study done by Nishant Kumar, Devashri Chilke et al,¹⁹ tuning fork test showed conductive hearing loss in 98.7% cases of CSOM included in our study. In the study performed by Nishant Kumar, Devashri Chilke et al,¹⁹ 92.18% had conductive hearing loss. This is in agreement with the general concept that in safe type of CSOM with simple perforation of tympanic membrane, hearing loss

is mainly of conductive type. Diagnostic endoscopy revealed DNS either alone or in combination with other pathologies to be the commonest finding. Similar observations were made by Adhitya Yeolekar et al and Prempal Singh et al.¹⁴ Sinonasal diseases were present in 49.3% of cases in our study. The percentage includes the Sinonasal diseases alone and in combinations. More than one Sinonasal disease may be present in a patient. In the study by Adhitya Yeolekar et al, 90% patients had Sinonasal pathology. Poorey and Iyer¹⁸ reported pharyngeal and Sinonasal diseases in 93% patients with CSOM. Study by Prempal Singh et al¹⁴ reported 64% cases of CSOM had Sinonasal disease. Septal deviation was found in 36.7% of cases of CSOM in our study (considering anterior rhinoscopy, X-ray PNS and DNE). This is in accordance with the study by Prempal Singh et al¹⁴ (31%). In the study by Adhitya Yeolekar et al, septal deviation was found in 67% patients. After DNS, Sinusitis was the commonest Sinonasal finding in our study (8.7%). In the study by Adhitya Yeolekar et al, Sinusitis was found in 13% patients. Study by Prempal Singh et al¹⁴ revealed that 14% patients had sinusitis. Allergic Rhinitis was seen in 6.7% patients of CSOM in our study. The study by Adhitya Yeolekar et al noted allergic rhinitis in 7% patients, this is in accordance with our findings. Study by Prempal Singh et al¹⁴ has shown 19% of allergic rhinitis in patients having CSOM. This disparity could be due to changes in environmental allergens. Ghonaim et al highlighted allergic rhinitis as a predictor of CSOM.²⁰ In our study, nasal polyps were present in 3.3% cases of CSOM. 6% patients had nasal polyps in the study conducted by Adhitya Yeolekar et al. P. Von Cauwenberge and A. Derycke²¹ studied the relationship between nasal and middle ear pathology in school-going children. They also found a well-defined influence ($P < 0.05$) of septal deviation on middle ear status. A nation-wide survey carried out by Chong Sun Kim MD et al revealed prevalence of otitis media in patients with septal deviation. Fireman et al emphasised chronic otitis media as a multifactorial disease affected by nasal and paranasal sinus abnormalities.²²

CONCLUSION

CSOM is more prevalent in the 20-29 years age group. There is a slight female preponderance. The burden of the disease is borne by the rural population. In majority of cases, chronic suppurative otitis media is unilateral. Sinonasal disorders are common in patients with COM mucosal disease. Among the nasal symptoms, nasal obstruction is the commonest complaint followed by nasal discharge. Deviated nasal septum was found to be the commonest sinonasal disease associated with CSOM. All patients with CSOM should undergo thorough examination for underlying sinonasal diseases. Sinonasal diseases if any should be addressed along with the ear disease.

Limitations

Sample size is small compared to the global burden of the disease. Period of study was limited. Tests for Eustachian tube dysfunction were not included. Tests for allergy should have been included.

Recommendations

A study with larger sample size, followup study after correction of predisposing sinonasal pathology factors is recommended to identify a causal relation.

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