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Aetiological factor for chronic suppurative otitis media: a retrospective study

Hardik Darad[1]*, Mohit Sinha[2]

[1]Associate professor, [2]Assistant Professor, Department of Otorhinolaryngiology, Gujarat Adani Institute of Medical Science, Bhuj, Kutch, Gujarat, India

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***Correspondence:**
Dr. Hardik Darad,
E-mail: hardikdarad@yahoo.co.in

ABSTRACT

Background: Otitis media (OM) refers to a group of complex infectious and inflammatory diseases affecting the middle ear. The present study was conducted to understand the various aetiological factors in chronic suppurative otitis media (CSOM) and also to take into possible hereditary factors.
Methods: This retrospective study was conducted in 150 patients who had visited or were admitted at department of otorhinolaryngology and Head and Neck Surgery, Shree Sayaji General (SSG) Hospital, Vadodara, Gujarat. Detailed history regarding the illness was taken then clinical examination was carried out on the patient in a systemic manner, otoscopic examination, tuning fork test and pure tone audiometry was done. All the findings are noted in proforma. Means of both groups were compared by independent student t-test.
Results: Most of the patients were in lower socioeconomic class (59.33) and lower middle class (40.67). Fifty out of the 150 chronic suppuurative Otitis Media patients, had a history of discharge for more than 10 years of duration. DNS and septal spur was found as positive finding in 49 patients of CSOM. X-ray of mastoid Schuller's view was done in 87 patients, out of which 62 patients X-ray showed sclerosis of mastoid air cells, 16 cases showed partly pneumatization of mastoid air cells.
Conclusions: Chronic otitis media is an important cause of morbidity in very large group of Indian population. Between 20-40 years of age septal pathology was main aetiological factor for CSOM.

Keywords: Audiometry, Chronic otitis media, Interpetrous angle, Socioeconomic, Septal pathology

INTRODUCTION

Otitis media (OM) refers to a group of complex infectious and inflammatory diseases affecting the middle ear.[1] OM in general is very common, as studies show that around 80% of children should have experienced at least one episode by their third birthday.[2] OM has been broadly classified into two main types, acute and chronic. Acute OM (AOM) is characterized by the rapid onset of signs of inflammation, specifically bulging and possible perforation of the tympanic membrane, fullness and erythema, as well as symptoms associated with inflammation such as otalgia, irritability and fever.[3] Despite appropriate antibiotic therapy, AOM may progress to chronic suppurative otitis media (CSOM) characterized by persistent drainage from the middle ear associated with a perforated ear drum. When examined by otoscope, the middle ear looks red and inflamed with purulent discharge in CSOM patients. It is one of the most common chronic infectious diseases worldwide especially affecting children.[4] Hearing impairment is one of the most common sequelae of CSOM.[5]

Its incidence has been reported to depend on race and socio-economic factors.[6] The etiology and pathogenesis of otitis media are multifactorial and include genetic,

infections, allergy, environmental, social and racial factors and Eustachian tube dysfunction.[7] During the recent decades, the incidence of chronic suppurative otitis media has dramatically declined due to improvements in housing, hygiene and antimicrobial chemotherapy.[8] In the developing countries, there is differential prevalence among the different socioeconomic strata of the community. Okafor found that the majority of the patients with chronic ear disease came from poor communities living in subsistence agricultural or slum areas of the cities.[9] It is the commonest cause of persistent mild to moderate hearing impairment in children and young adults.[10]

It is a surprising feel that although mankind has suffered from infection of the middle ear at least since the day of Rhodesian Man and that it is such a common disease, still its aetiological factor are by no means clear. Though considerable knowledge of anatomy of the ear had been acquired already in the 17th century and Valsalva and Contugno had early established an anatomical basis for some of its diseases systematized knowledge of structure and function of the organ in health and disease is still scanty. It may be accepted that the longer the ear discharge persists the worse the Hearing gets and in some cases the deafness may be profound.

The studies conducted earlier on the aetiological factors of CSOM reported inconsistent results which makes it difficult to fully understand the nature of aetiopathology of the diseases. The present study was conducted to understand the various aetiological factors in CSOM and also to take info possible hereditary factors.

METHODS

This retrospective study was conducted in 150 patients who had visited or were admitted at department of otorhinolaryngology and Head and Neck Surgery Shree Sayaji General (SSG) Hospital, Vadodara, Gujarat from July 1998 to September 2000 for 26 Months. Ethical approval was taken from institutional review board and ethical committee of the college and written informed consent was obtained from all participants.

Inclusion criteria were patients having discharge for more than 3 months, patients not received antibiotics for past 5 days, patient not underwent any surgical treatment for CSOM. Exclusion Criteria were patients having any systemic diseases, those who were on antibiotics and those who were not willing to participate. Patients of all the age, sex, occupation and different socioeconomic status were selected. Detailed history regarding the illness was taken then clinical examination was carried out on the patient in a systemic manner, otoscopic examination, Tuning fork test and pure tone audiometry was done. All the findings are noted in proforma. Personal history was recorded for an known allergy and habits like smoking and alcohol. A detailed treatment history was recorded including the duration and type of medication used and prior surgery of ear, nose and throat with subjective as recorded by the patient.

Family histories of any chronic diseases were asked with special references to history of CSOM, to rule out any hereditary aetiology. Then all patients were subjected to detailed ENT examination. First of all, ear was examined including preauricular area, post auricular area, pinna, tragus, external auditory canal and tympanic membrane. Tuning fork test were done to know the side, type and severity of deafness.

Nose was examined by anterior and posterior rhinoscopy. This included external shape of nose, nasal septum for deviation, nasal mucosa and inflammation. Paranasal sinus tenderness was looked for. The oral cavity was examined for any tonsillar congestion or sign of chronic tonsillitis and oropharynx for post nasal drip or granular pharyngitis. Investigations included blood investigations and urine routine examination. X-ray submentovertex of base skull was done in 78 chronic suppurative otitis media patients and their interpetrous angle was compared with IPA in axial CT scan head of 40 patients of head injury without any history of ear discharge who were taken as control group.

Statistical analysis

The data was coded and entered into Microsoft Excel spread sheet. Analysis was done using SPSS version 15 (SPSS Inc. Chicago, IL, USA) Windows software program. The variables were assessed for normality using the Kolmogorov-Smirnov test. Descriptive statistics were calculated. Means of both groups were compared by independent student t-test. Level of significance was set at p =0.05.

RESULTS

In the present study of 150 patients of CSOM, the age group of patients range from 3 to 58 years. Most of the patients in the age group of 0-10 years patients were around 11.33%. Present study includes 91 male and 59 female participants. Most of the participants were in the 10-40 year age group. Most of the patients were in lower socioeconomic class (59.33) and lower middle class (40.67). Lower socioeconomic group had higher prevalence of CSOM than middle socioeconomic group as given in Table 1. Majority of females in the current study were housewives.

Table 1: Socioeconomic status of incidence of CSOM.

S. No	Socioeconomic group	No of cases of CSOM	Percentage
1	Lower	89	59.33
2	Upper	61	40.67

Fifty out of the 150 CSOM patients, had a history of discharge for more than 10 years of duration. 20 patients gave history of ear discharge for duration of 0-1 years as shown in Table 2. In the present study all 150 patients had complaints of ear discharge, 101 had unilateral and 49 had bilateral ear discharge. Earache was present in 9 patients, while both giddiness and post auricular swelling were present as associated ear complaints in 7 patients.

Table 2: Duration of ear discharge of CSOM.

S. No.	Duration (in years)	No of cases of CSOM	Percentage
1	0-1	20	13.33
2	1-5	48	32
3	5-10	25	16.67
4	More than 10	57	38

Fifty four patients had associated complaints of nasal discharge and obstruction, while 37 had throat complaints. Twenty patients had both nasal and throat complaints as given in Table 3. DNS and septal spur was found as positive finding in 49 patients of CSOM. Chronic tonsillitis was an associated finding in 18 cases. In this series one patients of bilateral cleft lip with cleft palate and 1 case of Down's syndrome was present.

Table 3: Associated symptoms in CSOM.

S. No.	Symptoms	No of cases of CSOM	Percentage
1	Nasal discharge	54	35.33
2	Throat pain/odynophagia	37	24.66
3	Sneezing	6	4
4	Post nasal Drip	4	2.66

Fifteen out of 150 cases were subjected to X-ray of Paranasal sinuses. 10 cases revealed positive finding. 4 cases showed unilateral maxillary sinusitis, while 6 cases showed bilateral maxillary sinusitits. Only one patient had left frontal sinusitis.

X-ray of mastoid Schuller's view was done in 87 patients, out of which 62 patients X-ray showed sclerosis of mastoid air cells, 16 cases showed partly pneumatization of mastoid air cells. Bony erosions and lytic lesions was present as a positive finding in 11 cases as presented in Table 4.

A comparison study was done between the interpetrous angle of 78 patients of CSOM measured in base-skull X-rays and control group of 40 head injury without past history of CSOM patients, in which the interpetrous angle was measured in axial CT scan. Mean value (115.73^0) of CSOM was found to be significantly higer ($p \leq 0.05$) in comparison to control group where mean angle value was 106.98^0.

Table 4: X-ray findings of Mastoid Schuller's view of CSOM.

S. No.	Symptoms	No of cases of CSOM	Percentage
1	Scleresionsosis of Mastoid air cells present	62	71.26
2	Partly pneumatization of mastoid air cells	16	18.39
3	Bony erosions and lytic	11	12.64
4	Cerebellar abscess on CT Scan	3	3.45

DISCUSSION

This retrospective study was conducted in 150 patients who had visited or were admitted at department of otorhinolaryngology and Head and Neck Surgery, Shree Sayaji General (SSG) Hospital, Vadodara, Gujarat. CSOM is one of the common ear diseases of the ear, particularly in childhood. Poor living conditions, overcrowding, poor hygiene and nutrition have been suggested as a basis for the widespread prevalence of CSOM in developing countries.[11]

In the present study of 150 patients of CSOM, the age group of patients range from 3 to 58 years. Most of the patients (11.33%) are in the age group between 0-10 years. There after a decline in the in the incidence in relation to age was observed. The reason for highest incidence of patients in 0 to 10 years of age group may be due to multiple reasons like low resistance, seek treatment before joining jobs or accessibility to hospital is more easier for this group of patients come to the hospitals.

In present of study the sex incidence among the cases was males 60.66% and females 39.34%. Study conducted in Singapore, Pakistan, Iran and other parts of India gave the similar results.[12-14]

In the present study, lower socioeconomic group had higher prevalence of CSOM than middle socioeconomic group. This is similar to reports from Britain, Nigeria, Pakistan, USA and Southern part of India.[13] Greater severity of CSOM was seen in people from lower social classes with less formal education and parents who are unemployed. The contribution of low socio-economic status and increased severity of CSOM might be multi factorial. Families of a lower social class often have more children and live in more congested homes with poor sanitation and hygiene, all of which create environmental conditions conducive to transmission of infectious agents. In addition malnutrition, which commonly accompanies low socio-economic status, suppresses the immune system and places poor children at greater risk of disease.

Poor living conditions, overcrowding, poor hygiene and nutrition have been suggested as a basis for the widespread prevalence of CSOM in developing countries.[11] Okafor et al study showed that there were only a few cases where CSOM affected patients from the higher socio-economic ladder and even then the pathology started before the patient moved up the socio-economic ladder.[9] CSOM with and without complication continues to affect a large number of patients particularly in developing countries. Studies in Bangladesh, India, various countries in Africa and among some disadvantaged ethnic groups have shown that CSOM may have prevalence between 2% and 17% among children.[15] In a survey of Nigerian school children aged 6-15 years, a higher rate of tympanic membrane perforations (evidence of CSOM) was found among rural children than in urban children. The ratio was 4%:1%.[16]

In the present study maximum number of ears 50 had disease for more than 10 years. Study by Vikram et al shown the average ear disease duration at presentation 7.74 years.[14] In this study, in 101 cases the disease was unilateral and 49 are bilateral. In this study we did not find any significant predominance of one ear, both left and right ears were almost equally affected. Study done by Maharjan et al and Akinpelu et al have similar results.[7,15] Fifty four patients had associated complaints of nasal discharge and obstruction, while 37 had throat complaints. Twenty patients had both nasal and throat complaints. DNS and septal spur was found as positive finding in 49 patients of CSOM.

A comparison study was done between the interpetrous angle of 78 patients of CSOM measured in base-skull X-rays and control group of 40 head injury without past history of CSOM patients, in which the interpetrous angle was measured in axial CT scan. Mean value (115.73^0) of CSOM was found to be significantly higer ($p \leq 0.05$) in comparison to control group where mean angle value was 106.98^0. Bhide et al studied interpetrous angle in 111 patients of CSOM from his biweekly clinic from June 1979 to September 1980 and compared the interpetrous angle of the patients with a control of 51 normal individuals. He found significant pathology.[17]

CONCLUSION

CSOM is still prevalent in people of low socioeconomic strata. Tonsillo-adenoid infections being most common etiological risk factor, the poor living state enhance these factors. Majority of the patients were in the age group of 10-40 years. Chronic otitis media is an important cause of morbidity in very large group of Indian population. Between 20-40 years of age septal pathology was main aetiological factor for CSOM.This morbidity is severe as duration of disease progresses. Student with CSOM are facing learning difficulties due to deafness, which affect their education resulting in increased burden over country.

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