



A STUDY ON CSOM (CHRONIC SUPPURATIVE OTITIS MEDIA) AND ITS PREDISPOSING FACTORS IN A TERTIARY CARE HOSPITAL, PATNA, BIHAR- CROSS SECTIONAL

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ABSTRACT

Introduction: Chronic Suppurative Otitis Media is a long-term inflammation of the middle ear cavity and mastoid antrum which is caused by a plenty of factors. Clinically, CSOM is classified into two types, namely the tubotympanic and the atticoantral. The etiology and pathogenesis of otitis media are multifactorial and include genetic, infections, allergy, environmental, social and racial factors and Eustachian tube dysfunction. So this study was conducted to assess the prevalence of CSOM types and to evaluate the predisposing factors in ENT OPD of a tertiary care hospital. **Materials And Methods:** A cross-sectional observational study was conducted among 100 patients of CSOM attending ENT OPD, of a tertiary care hospital in Patna district, Bihar, India. A pre-designed and pre-tested questionnaire was developed, with a consent form attached to it for voluntary participation, through which data were collected and the distributions of responses were presented as frequencies, percentages and chi-square for evaluating predisposing factors. **Results:** The tubotympanic disease was present in 93% of CSOM cases while 7% had atticoantral disease. Around 83% participants had CHL and 17% had MHL in CSOM. Around 45% had mild hearing loss, 39% had moderate hearing loss and 10% had severe degree of hearing loss.

Conclusion:

1. Duration >4 years was found significant for tubotympanic and CHL with p value <0.05
2. Agricultural base was also found to be significant factor for tybotympanic type of CSOM p value being <0.05.

KEYWORDS : Atticoantral; CSOM;Hearing loss; Middle ear; Tybotympanic

INTRODUCTION

Chronic Suppurative Otitis Media is a long-term inflammation of the middle ear cavity and mastoid antrum which is caused by a plenty of factors. It is a known fact that recurrence and persistence of infection is common. It is a common cause of deafness and can lead to permanent perforation. CSOM is generally caused by upper respiratory viral infections, followed by an invasion of pyogenic organisms. Investigations have revealed that the most prevalent organisms responsible for CSOM patients are *Pseudomonas* sp., *Staphylococcus aureus*, *Klebsiella pneumoniae*, and *Proteus* spp.⁽¹⁾

There are several influencing factors, such as infection, anatomy or physiology dysfunction, environment, allergy, or patient's factor including immunity, gender, and others. Clinically, CSOM is classified into two types, namely the tubotympanic and the atticoantral. CSOM disease begins with inflammation of the middle ear that lasts a long time and does not receive adequate management. Symptoms of CSOM may include thick and stink discharge from the ear canal (otorrhea), decreased hearing ability, ringing in ears, ear pain, ear fullness, headache, and dizziness.

Diagnosis of CSOM can be confirmed by examination using an otoscope or a microscope, hearing examination, facial nerve topography examination, bacterial culture examination, and antibiotics resistance test from the ear secretion, and also the ear and temporal bone imaging by Computed Tomography-Scan (CT-Scan) Magnetic Resonance Imaging (MRI) temporal⁽²⁾

Tubotympanic type of CSOM involves the antero-inferior portion of the middle ear cleft and generally associated with central perforation of the tympanic membrane. There is no risk of serious complications in this type of CSOM and it is also called safe or benign type of CSOM. Moreover this type is not associated with cholesteatoma therefore it is also named as CSOM without cholesteatoma and can be further classified

into two subtypes namely active and inactive depending upon whether there is infection or not.

On the other hand atticoantral disease involves the posterosuperior quadrant of the middle ear cleft i.e; attic, antrum and mastoid. This type of CSOM is characterized by an attic or a marginal perforation in the ear drum. Atticoantral disease involves a bone destructing pathology such as cholesteatoma, granulations or osteitis. In this way there is high risk of development of dangerous complications. Due to this high complication rate this is also called unsafe or dangerous type of CSOM.⁽³⁾

Its incidence has been accounted to depend on race and socio-economic factors. The etiology and pathogenesis of otitis media are multifactorial and include genetic, infections, allergy, environmental, social and racial factors and Eustachian tube dysfunction. During the recent times, the incidence of chronic suppurative otitis media has severely declined due to improvements in housing condition, hygiene and antimicrobial chemotherapy. In the developing countries, there is differential prevalence among the different socioeconomic strata of the community. It is found that the majority of the patients with chronic ear disease are from poor communities living in subsistence agricultural or slum areas of the cities.

Recent times despite advanced appropriate antibiotic therapy, AOM (acute otitis media) 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.

It is a surprising 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.⁽⁴⁾

CSOM can be further classified as squamous (safe) and mucosal type (unsafe). OME (otitis media with effusion) is a chronic inflammatory condition that is characterized by a non-purulent effusion which may be either mucoid or serous. OM is highly prevalent worldwide and is the main cause of hearing impairment in developing countries.

World Health Organization (WHO) has reported that hearing impairment in 42 million people (above 3 years) in the world was mainly caused by OM. The prevalence of OM varies in different countries, populations and ethnic groups.

Studies around the world have reported that the prevalence of ASOM varies from 2.3% to 20%, CSOM 4% to 33.3% and OME from 1.3% to 31.3%.The prevalence rate of ASOM in India is around 17–20%, CSOM is 7.8% and of OME is not yet known.⁽⁵⁾

Therefore, the present study aimed to determine the prevalence and identify the role played by various factors responsible for CSOM with type and severity of hearing loss in a tertiary care hospital Patna.

Aims And Objective

1. To study the prevalence of CSOM its types.
2. To evaluate the predisposing factors for the development of CSOM.

MATERIAL AND METHODS

This was a cross-sectional, observational study carried out in the month of January 2022, among patients, with CSOM, who attended ENT OPD of our tertiary care hospital, Patna, Bihar, India. Consent was obtained from the study participants, who were willing to participate on a voluntary basis.

100 patients attending ENT OPD with CSOM participated in the study and were selected using convenient sampling method.

A pre-designed and pre-tested pro forma divided into two parts: First part comprised questions pertaining to Socio-demographic profile such as Age, Gender, Location, Occupation and Socio-economic status . The second part of the questionnaire was to assess associated factor, Symptoms, Duration, Types of hearing loss ,type of CSOM and its severity.

Patients aged between 5-50 years, of both the sexes with previous history of ear pain,hearing loss or discharge, for at least 6 months and who gave consent for the study were included in the study.

Patients were excluded if they had history of head trauma, prior ear surgery, familial history of hearing loss, previous exposure to ototoxic drugs, chronic exposure to loud noise or uncontrolled systemic conditions (diabetes mellitus, hypertension, hypothyroidism, dyslipidemia etc.).

Detailed history was taken and age, sex, occupation ,location and duration of disease with audiometric evaluation were recorded.

Data tabulation and analysis were done using Microsoft excel 2010. The interpretation of responses was presented as frequencies , percentages and chi-square for associated factors using IBM SPSS version 23.0. Probability value of

<0.05 was taken as statistically significant.

RESULTS

Sociodemo Graphic Profile

The sample size taken for the study constituted for 100 patients attending ENT OPD for CSOM at a tertiary care hospital Patna, with 47(47%) males and 53 (53%) females. Age wise Most of the participants were from age group 10-20 years 46(46%) followed by 20-30 years 35(35%). Around 59(59%) participants belonged to rural areas followed by urban areas 41(41%). with 59(59%) subjects were dependent on agriculture for survival. The socioeconomic status was calculated according to the modified BG Prasad socioeconomic status scale which takes account per capita income. While assessing Socio economic status it was found that 40(40%) belonged to class iii followed by class ii 29 (29%) and followed by class iv 22(22%) and only 9 (9%) belonged to class i. Table I and Table II.

Table-I Depicts (age Distribution ,gender And Socio-economic Status)

Age in years	Numbers And Percentages
<10	3(3%)
10-20	46(46%)
20-30	35(35%)
30-40	9(9%)
40-50	7(7%)
GENDER	
MALE	47(47%)
FEMALE	53(53%)
SOCIO-ECONMOMIC STATUS ⁽⁶⁾	
I	9(9%)
II	29(29%)
III	40(40%)
IV	22(22%)
V	0

Table -II (Occupation and Location)

Location	Occupation	Total	
Urban	35	6	41
Rural	6	53	59
Total	41	59	100

Distribution Of Various Symptoms

While assessing for various symptoms it was noticed that around 34(34%) participants came with complaint of right ear pain and 34(34%) came with left ear pain. Followed by bilateral hearing loss and right ear hearing loss 9(9%) respectively. And various other complaints such as bilateral ear pain, left or right ear discharge, bilateral discharge etc. Table-III

Table -III Showing Various Complaints In CSOM Cases

Complaints	Percentages
Bilateral hearing loss	9(9%)
Bilateral ear pain	3(3%)
Left ear pain	34(34%)
Right ear pain	34(34%)
Left ear discharge	6(6%)
Right ear discharge	2(2%)
Left ear hearing loss	3(3%)
Right ear hearing loss	9(9%)

prevalence of type of hearing loss ,severity of hearing and type of CSOM.

The total prevalence of CSOM type was found to be 93 (93%) cases with tubotympanic type constituting majority cases trailed by atticocentral type 7(7%) cases. The most patients presented with mild hearing impairment 45 (45%) followed by moderate hearing impairment 39 (39%) and 10(10%) with

severe hearing impairment. Out of all cases 83(83%) had conductive hearing loss and 17(17%) had mixed type of hearing loss. Table -IV

Table-IV Depicts Type Of CSOM, Type Of Hearing Loss And Severity Of Hearing Loss.

Type of CSOM	percentages
Typotympanic	93(93%)
Atticoantral	7(7%)
Type of hearing loss	
Conductive	83(83%)
Mixed	17(17%)
Severity of hearing loss	
Mild	45(45%)
Moderate	39(39%)
Severe	10(10%)

Study was further continued and some probable predisposing factors were assessed like Age, Gender, Location, Occupation, Soci-economic status and Duration of diseases for types of hearing loss and type of CSOM. which lead to conclude that – Duration of the disease > 4years was found to be a major predisposing factor for tybotympanic CSOM and conductive hearing loss with p value <0.05 (<0.001)

Agriculture as occupation was also found to be a predisposing factor for typo tympanic CSOM with p value <0.05 (0.03).Table-V

Table - V- Depicts The Statistically Significant Predisposing Factors

Durat ion	Type of CSOM	T.T	A.A	P value	Hearing loss	CHL	MHL	P Value
>4 years		83%	1%	<0.01		83%	1%	<0.01
Occupation	Type of CSOM	T.T ¹	A.A ²	P value				
Agriculture		52%	7%	0.03				

*1-tybotympanic *2atticoantral

DISCUSSION

(CSOM) is one of the most common ear diseases in the South East Asia having a prevalence of approximately 5.2% in the general population. Incidence of this disease is the higher in developing countries, especially among the lower socioeconomic society because of malnutrition, overcrowding, poor hygiene, inadequate health care, and recurrent upper respiratory tract infection. In the developing countries, there is differential prevalence among the different socioeconomic strata of the community.

India has been classified as the high prevalence country. CSOM is a preventable cause of hearing impairment. The early diagnosis and management can prove to be effective, in reducing the burden and prevention of deafness.⁽⁷⁾

In this study, the prevalence of tubotympanic and atticoantral CSOM was found to be 93(93%) and 7(7%) respectively, which was significantly higher (p value 0.03) in people with agricultural base as compared to non-agricultural base. No significant difference was observed in its prevalence with respect to Age,gender,location and soci-economic status.

while duration >4 years was observed as one of the predisposing factor for tybotympanic CSOM and conductive hearing loss with p value< 0.05.

This study done by Garud S, Buche A ,Keche P,Chamania G on Socioeconomic impact on prevalence of chronic suppurative otitis media in school going children in a Tribal district of India showed the prevalence of tubotympanic (89.43%) and atticoantral (10.57%).⁽⁷⁾similar findings of

Olubanjo and Amusa (2008)⁽⁸⁾83.7% , Olatoheet al.(99%)⁽⁹⁾ , Parmar, et al (87.18%)⁽¹⁰⁾

All results are similar to present study,which might be because of similar socio-demographic factors and similar setup.

Akhtar N, Haneef M, Naeem A conducted a study on Chronic Suppurative Otitis Media Contributory Factors and Their Prevention which showed Tubotympanic type of CSOM was in 112 (74.7%) patients Atticoantral type of CSOM was found in 38 (25.3%) patients . Majority of the patients (93 patients/62%) fell in the age range of 11-30 years. Socioeconomic status showed that 62.8% patients with CSOM belonged to poor class.which was similar to the present study.⁽³⁾

A study conducted by Darad H, Sinha M on Aetiological factor for chronic suppurative otitis media: a retrospective study. Present study includes 60% female and 40% male 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%).⁽⁴⁾Almost similar to finding of present study.

Studies conducted by Moruskar A, Karodpati N, Ingale M, Shah S on pattern of hearing loss in CSOM at D.Y Partil Hospital & Research Centre, DPU, Pune, India⁽¹¹⁾ and A Study of Sensorineural Hearing Loss in Chronic Suppurative Otitis Media by Smitha S. G. et al at kims Bangluru ⁽¹²⁾showed exactly same result . Around 72% study participants with conductive hearing loss (_CHL)and 28% of mixed hearing loss.(MHL)

Present study showing prevalence of CHL 83(83%) and MHL 17(17%).This similarity might be because both the studies were conducted in similar clinical setup.

A study conducted by Imrinder Kaur, J. P. Goyal and Dalbir Singh on prevalence of chronic suppurative otitis media in school going children of patiala district of punjab, india showed 76.4% participants had tybotympanic type and 23.26% of participants had atticoantral type of CSOM.

Similar to the present study,which might be because major chunk of study participants are children or young adults.⁽¹³⁾

Limitations

Our study involved only participants attending ENT OPD, which should have been conducted in different geographical areas with a larger sample size to generalize the findings. Other factors such as diet, exposure to secondary smoking and living conditions were not included in the study.

SUMMARY AND CONCLUSION

The present study was conducted in an E.NT OPD of a tertiary care hospital,Patna,Bihar to find out the prevalence of types of CSOM,hearing loss and its predisposing factors in patients attending E.N.T opd. A total of 100 participants in the age group of 5–50 years were serially examined with the help of hand-held portable otoscope. 41 participants belonged to urban area whereas 59 participants were from rural area and similiary 41 participants were dependent on non-agricultural earning for survival and rest were dependent on agricultural earning.

- A total of 34-34 participants were found to be suffering from either right or left ear ache in CSOM followed by hearing loss> discharge .
- 40% of cases of CSOM belonged to lower middle socioeconomic group followed by upper middle > upper lower group.
- The tubotympanic disease was present in 93% of CSOM cases while 7% had atticoantral disease.
- Around 83% participants had CHL and 17% had MHL in CSOM

- When severity of hearing loss was assessed it was seen that 6% of participants were normal while 45% had mild hearing loss ,39% had moderate hearing loss and 10% had severe degree of hearing loss.
- While assessing predisposing factors only duration > 4 years and agricultural earning was found to be a significant factor for tybotympanic CSOM.
- Duration of disease >4 years was also a significant factor for CHL.

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Conflicts Of Interest

There are no conflicts of interest.

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