Prevalence and Risk Factors of Chronic Suppurative Otitis Media in a Teaching Hospital, Telangana

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ABSTRACT

BACKGROUND
Chronic suppurative otitis media (CSOM) is defined as a chronic inflammation of the middle ear and mastoid cavity. The disease usually begins in childhood. We need to study the prevalence and risk factors of chronic suppurative otitis media in a teaching hospital in Telangana.

METHODS
This was a cross sectional study done among patients with CSOM attending the Department of ENT for a duration of one year from January 2019 to December 2019. Detailed history, otoscopic examination and culture sensitivity tests of ear discharge were done.

RESULTS
The sample size was 150. The prevalence of CSOM was reported to be 7.5 %. Majority of the cases were in the 11 - 15 years age group, i.e., 56.6 %. Tubotympanic type was most commonly reported and accounted for 80 % (100 / 150) whereas atticoantral type was 20 %. *Pseudomonas aeruginosa* was the most commonly isolated organism from the ear discharge. Most of the CSOM cases presented with upper respiratory tract infection i.e., 20 %.

CONCLUSIONS
The prevalence of CSOM in our study was 7.5 % and it was more common in the younger age group. CSOM was more common in the lower socioeconomic class. Upper respiratory tract infection is a frequent mode of presentation of CSOM.

KEYWORDS
CSOM, Ear Discharge, Tubotympanic CSOM, Atticoantral CSOM

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BACKGROUND

Chronic suppurative otitis media (CSOM) is defined as a chronic inflammation of the middle ear and mastoid cavity, which presents with recurrent ear discharge or otorrhoea through a tympanic perforation. The disease usually begins in childhood[1] as a spontaneous tympanic perforation due to an acute infection of the middle ear, known as acute otitis media (AOM), or as a sequel of less severe forms of otitis media e.g. secretory OM.[2] The infection may occur during the first 6 years of a child's life, with a peak around 2 years.[3] The point in time when AOM becomes CSOM is still controversial. Generally, patients with tympanic perforations which continue to discharge mucoid material for periods of 6 weeks[4] to 3 months, despite medical treatment, are recognized as CSOM cases. The WHO definition requires only 2 weeks of otorrhoea,[5] but otolaryngologists tend to adopt a longer duration, e.g. more than 3 months of active disease.[6] In CSOM the bacteria may be aerobic (e.g. *Pseudomonas aeruginosa*, *Escherichia coli, S. aureus, Streptococcus pyogenes*, *Proteus mirabilis*, klebsiella species) or anaerobic (e.g. bacteroides, peptostreptococcus, proprionibacterium).[7]

The bacteria are infrequently found in the skin of the external canal, but may proliferate in the presence of trauma, inflammation, lacerations or high humidity.[8] These bacteria may then gain entry to the middle ear through a chronic perforation.[9] Among these bacteria, *P. aeruginosa* has been particularly blamed for the deep-seated and progressive destruction of middle ear and mastoid structures through its toxins and enzymes.

CSOM produces mild to moderate conductive hearing loss in more than 50 % of cases. This results from disruption of the eardrum and ossicles assembly (conductive hearing loss) or from hair cell damage by bacterial infection that has penetrated the inner ear (sensory hearing loss), or both (mixed hearing loss).[10] CSOM produces chronic mastoiditis by contiguous spread.[11] Erosion of the walls of the middle ear and mastoid cavity, which is rare, leads to exposure of the facial nerve, jugular bulb, lateral sinus, membranous labyrinth and temporal lobe dura. This in turn leads to such complications as facial nerve paralysis, lateral sinus thrombosis, labyrinthitis, meningitis and brain abscess.[12] Contiguous or haematogenous spread of infection to the brain produces similar, permanently disabling and potentially fatal complications.[13] Inadequate antibiotic treatments, frequent upper respiratory tract infections, nasal disease, [14] and poor living conditions with poor access to medical care[15] are related to the development of CSOM.[16]

We wanted to study the prevalence and risk factors of chronic suppurative otitis media in a teaching hospital in Telangana.

METHODS

This was a prospective cross-sectional study conducted in the Outpatient department of ENT at Maheshwara Medical College and Hospital, Patancheru, Hyderabad, Telangana, over a period of one year from January 2019 to December 2019. There were no ethical issues involved. Informed consent was obtained from all the patients included in the study.

Inclusion Criteria

Age 5 years to 30 years
Both genders
Patients with complaints of CSOM

Exclusion Criteria

Age < 05 years and > 30 years.
Pregnant women were excluded.
Deaf and mute patients were excluded.

Cases were selected based on the above criteria. Detailed clinical history was taken such as age, gender, occupation, residential address, personal history and history of present illness including ear pain, ear discharge, fever. Socioeconomic status was calculated according to the modified Kuppuswamy socioeconomic status scale proposed by the Government of India, which takes into account education, occupation, and income. Ear, nose and throat (ENT) examination was done in all the cases.

All the cases were screened and examined with the help of the otoscope. Chronic form of suppurative otitis media was classified into safe (tubotympanic) and unsafe (atticoantral) type.

1. Tubotympainc type: In these type central perforations of all variety were included (active, quiescent and inactive state)
2. Atticoantral type: Posterosuperior marginal perforation and perforation of pars flaccida, retractions with granulations and or cholesteatoma at similar site.

Routine investigations were done for all the cases and culture sensitivity test of the ear discharge was done wherever possible.

RESULTS

A total of 2000 patients visited the ENT OPD during the study period of which 150 cases were diagnosed as having CSOM and these 150 cases were studied. In the present study, the age of the patients ranged from 05 years to 30 years. Majority of the cases were among 11-15 years ie, 56.6 %. There were 103 (68.6 %) males and 47 (31.3 %) female patients. The male to female ratio was 2.2:1.

Age Distribution	No. of Cases	Percent (%)
05 - 10 years	35	23.3
11 - 15 years	85	56.6
16 - 20 years	20	13.3
21 - 30 years	10	6.6
Total	**150**	**100 %**

Table 1. Age Distribution

Socioeconomic Status

There were 10 (6.6 % 0 cases from the Upper class, 15 (10 %) cases from the Upper middle class, 45 (30 %) cases from the Lower middle class and 80 (53.3 %) cases from the Lower class.

Types of CSOM

In the present study, Tubotympanic type was most commonly reported and constituted about 80 % (100 / 150), whereas Attico antral type was noted in 20 % cases.

Tubotympanic type CSOM was seen in 78 (52 %) cases on right side, 15 (10 %) on left side and bilaterally in 27 (18 %) cases. The Atticoantral type was seen 22 (14.6 %) on right side, 05 (3.3 %) cases on left side and bilaterally in 03 (2 %) cases.

Symptoms	No. of Cases	Percent (%)
Mucopurulent discharge	85	56.6 %
Hearing loss	33	22 %
Marginal perforation	05	3.3 %
Central perforation	10	6.6 %
Middle ear congestion	12	8 %
Polyp	05	3.3 %
Total	**150**	**100 %**

Table 2. Symptoms of CSOM

In the present study, mucopurulent discharge was the most common symptom and was noted in 56.6 % cases. Hearing loss was seen in 22 % cases of which 75 % were conductive type hearing loss and 25 % was of mixed type.

Associated Factors	No. of Cases	Percent (%)
Upper respiratory tract infection	30	20 %
Chronic Tonsillitis	25	16.6 %
Chronic Sinusitis	25	16.6 %
Chronic adenotonsillitis	29	19.3 %
Allergic rhinitis	10	6.6 %
Not associated with any factors	31	20.6 %
Total	**150**	**100 %**

Table 3. Associated Factors in CSOM

In the present study, most common associated factors in CSOM cases were upper respiratory tract infection and chronic adenotonsillitis.

Risk Factors

Overcrowding was noted in 84 (56 %) cases, smoking was noted in 10 (6.6 %) cases, family history of ear discharge was present in 11 (7.3 %) cases and history of bathing in contaminated water was present in 45 (30 %) cases.

Organism	No. of Cases	Percent (%)
Psuedomonas	70	82.3 %
Staphyloccocus	10	11.7 %
Proteus	02	2.3 %
Klebsiella	03	3.5 %
Total	**85**	**100 %**

Table 4. Organism Isolated from Ear Discharge

In the present study most common organism isolated from the discharge was Psuedomonas species. In the present study prevalence of CSOM was reported as 7.5 %.
Sample size was no. of cases with CSOM / Total no. of cases attended ENT OPD X 100

$$\frac{150 \times 100}{2000} = 7.5\%$$

DISCUSSION

The present study was undertaken to determine the prevalence of CSOM in hospital visiting patients and to determine the associated risk factors for CSOM.

Age Distribution

In the present study, majority of the cases were among 11-15 years ie, 56.6 %, followed by 23.3 % between 5 - 10 years. These findings were correlated with other similar studies. In the study by Garud S et al.[17] maximum patients were in 8 - 10 years with 383 (38.5 %) subjects followed by 6 - 8 years with 360 subjects (36.4 %). In the study by Manche SK et al.[18] the mean (SD) age of Otitis media subjects was 32.9 (17.73) years and mean (SD) age of onset was 8.3 (6.73) years in 1 – 15 years, 30.0 (5.61) years in 15 – 30 and 53.5 (9.3) years in > 30 years age group. In the study by Singhal A et al.[19] 93.13 % participants were in age group of 6 to 12 years of age.

Gender Distribution

In the present study, males constituted 68.6 % and females about 31.3 % and the male to female ratio was 2.2:1. The findings were similar with studies of Garud S et al.[17] which had 566 males (57.17 %) and 424 females (42.82 %) and Manche SK et al.[18] which had 58.6 % (N = 1525) males and 41.4 % (N = 1077) females respectively. In the study by Singhal A et al.[19] there were 283 (57.17 %) male and 212 (42.83 %) female patients.

Socioeconomic Status

In the present study, majority of the population were from lower class ie, 53.3 %, followed by 30 % from lower-middle class. Garud S et al.[17] in their study reported 407 (41.11 %) were in the upper and lower socioeconomic groups followed by 200 (20.2 %) in the lower middle socioeconomic group.

Singhal A et al.[19] in their study observed that 29.90 % study participants belonged to lower socioeconomic strata and 26.06 % study participants belonged to upper-lower strata. Parmar SM et al.[20] in a similar study reported that majority of their cases belonged to upper-lower (42.10 %) and lower-middle (31.57 %) class families.

Prevalence of CSOM

In the present study, prevalence of CSOM was observed as 7.5 %. In the study done by Garud S et al.[17] the total prevalence of CSOM was found to be 64 (6.4 %) and in the study done by Singhal A et al.[19] the prevalence of CSOM was found to be 6.46 %.

Type of CSOM

In our study, Tubotympanic type was most commonly reported and constituted about 80 % (100 / 150) whereas Atticoantral type was seen in 20 % cases. Garud S et al. in[17] in their study observed tubotympanic type constituting majority of 56 (87.50 %) cases and atticoantral type was 8 (12.5 %) cases. Manche SK et al.[18] observed Squamous-CSOM (47.3 %) to be more common as compared to other subtypes of OM. In the study by Singhal A et al.[19] Tubotympanic type constituted majority of 26 (81.25 %) cases followed by Atticoantral type 6 (18.75 %) cases. Our findings correlate well with the above authors.

Risk Factors

In the present study, over - crowding was noted in 56 % cases. History of bathing in contaminated water was present in 30 % cases. Parmar SM et al.[20] reported major risk factors as smoking habits of the father (42.10 %) and indoor cooking with kerosene oil (36.84 %).

Comorbid Conditions

In the present study, upper respiratory tract infection was associated with CSOM in 20 % cases and next common was chronic adenotonsillitis which was seen in 19.3 % cases. Parmar SM et al.[20] observed major factors associated to be an upper respiratory infection (URI) followed by chronic tonsillitis and chronic adenotonsillitis.

Symptoms

In the present study, mucopurulent discharge was noted in 56.6 % cases and hearing loss was seen in 22 % cases of which 75 % cases had conductive type hearing loss and 25 % had of mixed type. In Garud S et al.[17] most of the patients presented with moderate hearing impairment 28 (43.75 %), and mild hearing impairment 20 (31.25 %). Associated nasal and throat diseases were present in 36 patients. In the study by Singhal A et al.[19] most of the paediatric patients presented with moderate hearing impairment in 14 (43.75 %), and mild hearing impairment in 10 (31.25 %). Associated nasal and throat diseases were present in 18 (56.25 %) cases.

CONCLUSIONS

The prevalence of CSOM in our study was 7.5 % and it was more common in the younger age group. CSOM was more common in the lower socioeconomic class. Upper respiratory tract infection is a frequent mode of presentation of CSOM.

Data sharing statement provided by the authors is available with the full text of this article at jebmh.com.
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