

# Socioeconomic impact on prevalence of chronic suppurative otitis media in school going children in a tribal district of India

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## ABSTRACT


**Background:** Chronic suppurative otitis media (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. The socioeconomic cost of CSOM can hamper the auditory development of the child, thus putting a burden on the society. **Objective:** To find the prevalence of CSOM in school going children and its relation with socioeconomic status. **Materials and Methods:** Descriptive cross-sectional study involving 990 schools going children in Nanded District of Maharashtra. **Result:** The prevalence of CSOM was found to be 6.4%, with tubotympanic type constituting majority 87.50% trailed by atticoantral type 12.50%. With respect to socioeconomic groups, upper lower, groups had 37.5%, and lower group had 34.37% prevalence. Most patients presented with moderate hearing impairment 43.75% and mild hearing impairment 31.25%. **Conclusion:** The socioeconomic cost of CSOM puts an immense burden on the growth of a child. Improvement of health care facilities and awareness among health-care providers would definitely be helpful in reducing the prevalence of ear diseases in the developing countries like India.

**KEY WORDS:** CSOM; Socioeconomic; Tubotympanic; Atticoantral; Children

## INTRODUCTION

Chronic suppurative otitis media (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.<sup>[1]</sup> Chronic otitis media (COM) equates with the classic term chronic “suppurative” otitis media that is no longer advocated as COM is not necessarily a result of “the gathering of pus.” However, the distinction remains between active COM, where there is inflammation and the production of pus, and inactive COM, where this is not the case though there is the potential for the ear to become active at some

time.<sup>[2]</sup> 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.<sup>[3]</sup> In the developing countries, there is differential prevalence among the different socioeconomic strata of the community.<sup>[4]</sup> The socioeconomic cost of CSOM is still very high both financially and non-financially for the society despite the fact that CSOM is a common disease. There is a need for capacity building to reduce the burden as well as the associated risk.<sup>[5]</sup> The HUNT study indicates that CSOM and recurrent acute otitis media in childhood are associated with adult hearing loss, underlining the importance of optimal treatment in these conditions. It suggests that ears with a subsequent hearing loss, after otitis media in childhood age at a faster rate than those without.<sup>[6]</sup> As proposed by World Health Organization (WHO), during a WHO/CIBA workshop of otitis media experts in 1996, CSOM prevalence rate of 1-2% was considered low and 3-6% to be high. With a national average of CSOM to be 5.2%, India has been classified as the high prevalence country.<sup>[7]</sup> CSOM is a preventable cause

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of hearing impairment. The early diagnosis and management can prove to be effective, in reducing socioeconomic burden and prevention of deafness.<sup>[8]</sup>

## MATERIALS AND METHODS

This is a descriptive cross-sectional study conducted from January 2012 to June 2013 in Nanded District of Maharashtra, India. In this study, about 990 schools going children in Nanded city age ranging from 6 years to 15 years, were selected as a study group. The schools were selected in such a way that the students of all socioeconomic strata could be included. The study population was classified into age groups, <6 years, 6-8 year, 8-10 year, 10-12 year, and more than 12 year.

This study is a part of a larger study that was conducted in three primary schools in Nanded District of Maharashtra, the first school was an urban private school, the second school was a Zilla Parishad school, and the third school was Ashram Shala school under Tribal Development Commissionerate Government of Maharashtra, India, for children of migrant workers and tribal population.

A pro forma (case record form) was prepared to carry out the study. The initial school survey was carried out and the students were examined according to the pro forma (case record form), which was distributed to the children or to the respective class teachers. Moreover, the class teachers were asked to fill up the primary information in consultation with parents regarding the name, place of residence, father's occupation, the living conditions and if possible, the history of major illness in past, in the student or family. The pro forma were distributed and were collected on the next day or, on the next visit to the student. Student were then stratified according to their socioeconomic status with modified Kuppuswamy's socioeconomic scale.<sup>[9]</sup>

All the study subjects were subjected to detailed ear, nose and throat (ENT) examination at the school. Among 990 subjects, students having ear complaints were screened and further examined with the help of the otoscope (Heine Co. Germany) and other standard instruments used for routine ENT checkup. The prevalent chronic form of suppurative otitis media in the students was classified into safe (tubotympanic) and unsafe (atticoantral) type.

1. Tubotympanic 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 were included under this heading.

## RESULTS

### Sociodemographic Profile

The sample size taken for the study constituted for 990 schools going children, with 566 males (57.17%) and 424 females (42.82%). Most of the children were from an urban areas 512 (51.17%) followed by rural areas 478 (48.29%). Age wise maximum patients were in 8-10 years with 383 (38.5%) subjects followed by 6-8 years with 360 subjects (36.4%). 407 (41.11%) were in the upper and lower socioeconomic groups followed by lower middle socioeconomic group 200 (20.20%) (Tables 1-3).

### Prevalence of CSOM

The total prevalence of CSOM was found to be 64 (6.4%) cases with tubotympanic type constituting majority 56 (87.50%) cases trailed by atticoantral type 8 (12.50%) cases. With respect to socioeconomic groups, upper lower groups lead by 24 (37.5%) cases and lower group 22 (34.37%) cases. The most patients presented with moderate hearing impairment 28 (43.75%), and mild hearing impairment 20 (31.25%). 36 patients had associated nasal and throat diseases (Tables 4-6).

**Table 1:** Distribution of subjects according to habitat and sex

Place of residence	Male childrens	Female childrens	Total childrens (%)
Rural	273	205	478 (48.29)
Urban	293	219	512 (51.71)
Total	566	424	990 (100)

**Table 2:** Distribution of subjects according to age group

Age group	School going children (%)
<6 years	30 (3.1)
6-8 years	360 (36.4)
8-10 years	383 (38.5)
10-12 years	180 (18.2)
>12 years	37 (3.8)
Total	990 (100)

**Table 3:** Distribution of all subjects according to socioeconomic status

Socioeconomic status	School going children (%)
Upper	101 (10.2)
Upper middle	130 (13.13)
Lower middle	200 (20.20)
Upper lower	407 (41.11)
Lower	152 (15.35)
Total	990 (100.00)

**Table 4:** Distribution of CSOM by type

Type of CSOM	Number of subjects (%)
Tubotympanic CSOM	56 (87.50)
Atticoantral CSOM	08 (12.50)
Total	64 (100.00)

CSOM: Chronic suppurative otitis media

**Table 5:** Distribution of CSOM by socioeconomic status

Socioeconomic status	Number of affected subjects (%)
Upper	2 (3.125)
Upper middle	6 (9.375)
Lower middle	10 (15.625)
Upper lower	24 (37.5)
Lower	22 (34.375)
Total	64 (100.00)

CSOM: Chronic suppurative otitis media

**Table 6:** Hearing impairment in CSOM subjects

Hearing impairment	Affected subject (%)
Mild hearing impairment	20 (31.25)
Moderate hearing impairment	28 (43.75)
Moderately severe hearing impairment	16 (25.00)
Severe hearing impairment	00
Profound hearing impairment	00
Total	64

CSOM: Chronic suppurative otitis media

## DISCUSSION

In this study, the prevalence of CSOM in school going children was found to be 6.4% which was significantly higher in rural areas as compared to urban. No significant difference was observed in its prevalence with respect to gender and age of children, while it was observed to be significantly associated with socioeconomic status. WHO deafness and hearing impairment - fact sheet has given prevalence of CSOM in the South East Asia region to be 5.2%.<sup>[1]</sup>

This study had strong correlation regarding type of CSOM, i.e., tubotympanic or atticoantral with Gupta and Mittal,<sup>[8]</sup> tubotympanic (89.43%) and atticoantral (10.57%).

Some studies have reported the lower prevalence of CSOM as compared to our study, such as Kalpana and Chamyal<sup>[10]</sup> in Pune District of India have reported prevalence to be 4.75%. Wakode *et al.*<sup>[11]</sup> in Yavatmal District of Maharashtra have found prevalence to be 3.0%. In a study conducted by Minja and Machemba,<sup>[12]</sup> on 802 primary school children in Dar es Salaam, Tanzania prevalence was found to be 2.6%. The reasons for these differences from our study may be different geographical location with respect to socioeconomic and environmental conditions, different age groups of the children

studied and different diagnostic criteria used for diagnosing CSOM.

However, other studies have reported a higher prevalence of CSOM with respect to our study Adhikari *et al.*<sup>[13]</sup> have reported a prevalence of 5.7%. Akinpelu *et al.*<sup>[14]</sup> have found the prevalence in school going children of Nigeria to be 11.1%. The prevalence of CSOM was found to be 7.8% in a study conducted by Jacob *et al.*<sup>[15]</sup> (1997) in Tamil Nadu, Basak *et al.*<sup>[16]</sup> have stated a prevalence of 37.54% which is much higher than that of our study.

## Limitations

Our study involved only three schools in the Nanded District, 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, living conditions, and frequency of visits to the ENT specialist were not included in the study.

## CONCLUSION

The socioeconomic cost of CSOM puts an immense burden on the growth of a child. There is a need for capacity building to reduce the burden of cost of chronic as well as the associated risk. This if done at the level of the primary health care especially in the area of basic ENT care will encourage early presentation and appropriate management.

Increasing awareness about ear diseases should be one of the goals of all health-care providers. Improvement of health care facilities and awareness among health-care providers would definitely be helpful in reducing the prevalence of ear diseases in the developing countries like ours.

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