International Journal of Otorhinolaryngology and Head and Neck Surgery
*Kishore HR et al. Int J Otorhinolaryngol Head Neck Surg. 2020 Dec;6(12):2222-2228*
http://www.ijorl.com
pISSN 2454-5929 | eISSN 2454-5937

DOI: https://dx.doi.org/10.18203/issn.2454-5929.ijohns20205063

**Original Research Article**

# Clinico-epidemiological profile of chronic otitis media at a tertiary care hospital

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**Received:** 18 September 2020
**Accepted:** 05 November 2020

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## ABSTRACT

**Background:** Chronic otitis media equates with the term chronic suppurative otitis media that is no longer advocated as it is not necessarily a result of the gathering of pus. Incidence of this disease is higher in developing countries especially among lower socioeconomic society because of malnutrition, overcrowding, poor hygiene, inadequate health care facility and recurrent upper respiratory tract infection.
**Methods:** Eighty patients with chronic otitis media were included. After obtaining written and informed consent, they were subjected to detailed history taking and examination. Various risk factors of chronic otitis media and the morbidity caused by the disease were studied. Data was analyzed using IBM SPSS version 22.
**Results:** The most common age group was 21-30 years with male predominance. Central perforation was the most common type of perforation. Various factors like low socioeconomic status, rural setup, overcrowding, malnutrition, indoor cooking, recurrent acute otitis media, recurrent upper respiratory tract infection, naso-respiratory allergies, habit of swimming, taking bath in pond, ear probing were found to cause the onset of the disease and worsen of the disease process.
**Conclusions:** Chronic otitis media results in various morbidity including increased financial burden, restricts daily activities, hence affects the psychological mindset and lowers the confidence of the patient giving them a feeling of social outcast. A proper awareness must be spread regarding these factors, maintaining personal hygiene, improving nutrition and immunity. An immediate consultation with the otorhinolaryngologist will reduce the disease progression and hence the complications.

**Keywords:** Chronic otitis media, Morbidity, Epidemiology

## INTRODUCTION

Chronic otitis media (COM) equates with the 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 there is no inflammation and the production of pus.[1]

Incidence of COM varies from 0.5%-2% in developed countries whereas in developing countries it varies from 3%-57%.[2] Incidence of this disease is higher in developing countries especially among lower socioeconomic society because of malnutrition, overcrowding, poor hygiene, inadequate health care and recurrent upper respiratory tract infection.[3] In the developing countries, there is differential prevalence among the different socioeconomic strata of the community.[4] The socioeconomic cost of COM is still very high both financially and non-financially for the

society. There is a need for capacity building to reduce the burden as well as the associated risk.[5]

This study has been taken up to determine the various epidemiological and etiological parameters causing chronic otitis media at a tertiary care hospital.

## METHODS

This is a prospective hospital based study conducted for a period of six months from December 2019 to May 2020 in the department of otorhinolaryngology head and neck surgery, Vijayanagara institute of medical sciences, Ballari, Karnataka, India. The patients were selected on simple random basis after taking informed written consent. Eighty clinically diagnosed patients of chronic otitis media of all age groups and both gender attending the department of otorhinolaryngology and head and neck surgery were included in this study.

### *Objectives*

Objective of the current study was to study the clinical and epidemiological profile in patients with chronic otitis media.

### *Inclusion criteria*

Cases of both tubotympanic and atticoantral type of chronic otitis media were included in the study.

### *Exclusion criteria*

Systemic causes of otitis media like tuberculosis, syphilis and other granulomatous conditions and malignancies of middle ear were excluded from this study.

All clinically diagnosed cases of chronic otitis media were subjected to detailed history taking and clinical examination. The socio-economic status was calculated according to revised BJ Prasad scale of socio-economic index.[6] These patients were asked regarding the risk factors which can lead to COM like past history of recurrent naso-respiratory allergies, upper respiratory tract infection (URTI), acute otitis media (AOM) and habitual factors like ear canal probing (cue tip injury), swimming, taking bath in pond and ear trauma.[7] Epidemiological factors like overcrowding, indoor cooking and malnutrition were studied.[7] The morbidity measures caused by chronic otitis media which have been studied in other studies were considered.[7] These were increased financial burden, decreased school performance, could not take part in sports activity, could not take part in social events, could not go to work, affecting daily activities and affecting learning abilities. The data was analyzed.

### *Statistical analysis*

Data was collected by using a structured proforma. Data was entered in MS excel sheet and analyzed by using IBM SPSS version 22. Qualitative data was expressed in terms of frequency and percentage. Mean and SD values were calculated for continuous variables. Mean values between the groups were analyzed by using Chi square tests. A $p<0.05$ was considered as statistically significant whereas $p<0.001$ was considered as highly significant.

## RESULTS

The results of current study are being summed up under the following subheadings;

### *Age distribution*

The mean age was 27.7 years. Minimum age was 3 years and maximum was 74 years. Among 80 patients, 11 (13.75%) patients were in 1-10 years of age group, 19 (23.75%) patients in 11-20 years, 22 (27.5%) patients were in 21-30 years, 12 (15%) patients in 31-40 years, 9 (11.5%) patients in 41-50 years, 3 (3.75%) patients in 61-70 years, 1 (1.25%) patients in 71-80 years (Figure 1). In current study, 23 (28.75%) patient belonged to pediatric age group and 57 (71.25%) patients were adults. The pediatrics: adult ratio was 0.4:1.

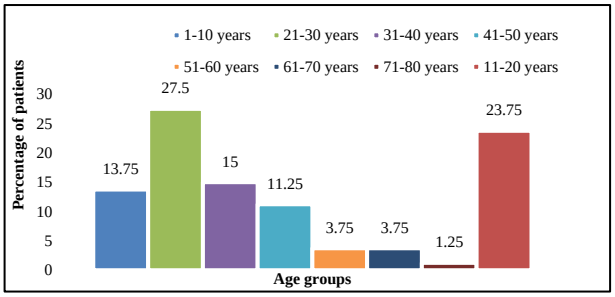


**Figure 1: Age distribution chart.**

### *Gender distribution*

Current study included 43 (53.75%) male and 37 (46.25%) female patients; male to female ratio was 1.16:1 (Figure 2).

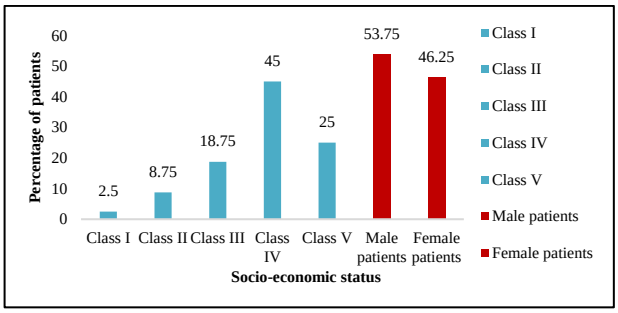


**Figure 2: Socioeconomic status and gender distribution chart.**

***Rural and urban distribution***

There were 55 (68.75%) patients from rural and 25 (31.25%) patients from urban setup.

***Socio-economic distribution***

There were 36 (45%) patients of class IV (lower middle class), followed by 20 (25%) patients of class V (lower class), 15 (18.75%) patients of class III (middle class), 7 (8.75 %) patients of class II (upper middle class) and 2 (2.5%) patients of class I (upper class) of socioeconomic status (Figure 2).

***Laterality of the disease***

There were 31 (38.75%) patients with right ear involvement followed by 27 (33.75%) patients with left ear and 22 (27.5%) patients with bilateral ear involvement.

***Symptoms distribution***

In our study, 74 (92.5%) patients complained of ear discharge and 6 (7.5%) patients had no ear discharge. Among 80 patients, 33 (41.25%) patients had ear discharge with hard of hearing, 17 (21.25%) patients had ear discharge with otalgia, 10 (12.5%) patients had ear discharge with tinnitus, 9 (11.25%) patients had ear discharge only, 7 (8.75%) patients had ear discharge with rhinitis, 4 (5%) patients had ear discharge with giddiness, 3 (3.75%) patients had otalgia only, 2 (2.5%) patients had ear discharge with facial weakness, 2 (2.5%) patients had ear discharge with itching in ears, 2 (2.5%) patients had hard of hearing with otalgia, 1 (1.25%) patient had hard of hearing with tinnitus, 1 (1.25%) patient had tinnitus only (Figure 3).

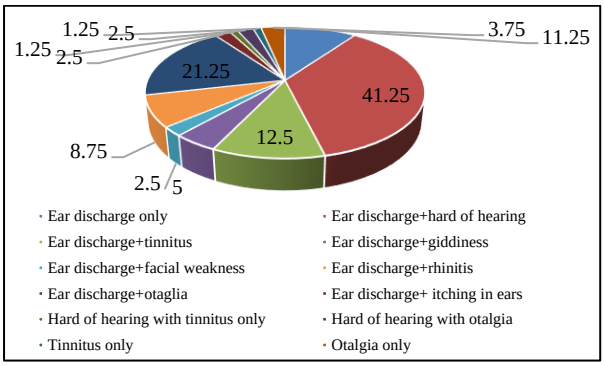


**Figure 3: Symptoms distribution chart.**

The ear discharge was non foul smelling and nonblood tinged in 47 (63.51%) patients, foul smelling and nonblood tinged in 26 (35.13%) patients, foul smelling and blood tinged in 3 (4.05%) patients, nonfoul smelling and nonblood tinged in 1 (1.35%) patient (Figure 4). It was observed that 62 (83.78%) patients had profuse ear discharge, 15 (20.27%) patients had scanty ear discharge.

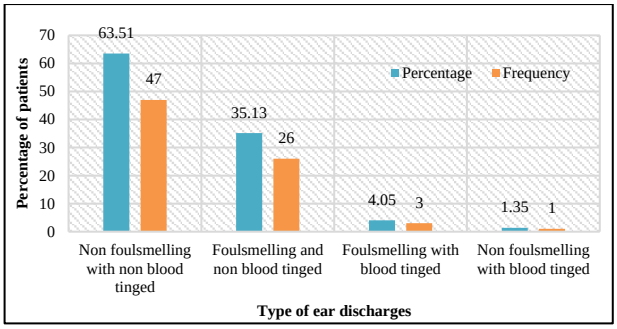


**Figure 4: Comparison of types of ear discharge.**

***Risk factor distribution***

We found that 57 (71.25%) out of 80 patients had recurrent URTI, 51 (63.75%) out of 80 patients had overcrowding, 48 (60%) out of 80 patients had history of unhygienic water practices like swimming and taking bath in pond, 46 (57.5%) out of 80 patients had recurrent acute otitis media, 46 (57.5%) out of 80 patients had indoor cooking, 45 (56.25%) out of 80 had recurrent naso-respiratory allergies, 28 (35%) out of 80 patients had history of cue tip injury and 23 (28.75%) out of 80 patients had malnutrition (Figure 5).

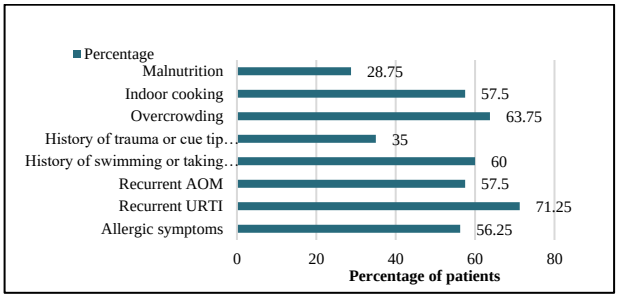


**Figure 5: Risk factors distribution chart.**

***Measures of morbidity caused by COM***

In our study, 61 (76.25%) out of 80 patients had increased financial burden, 54 (67.5%) out of 80 patients had their daily activities affected, 48 (60%) out of 80 patients could not take part in sports activities, 40 (50%) out of 80 patients had decreased school performance, 38 (47.5%) out of 80 patients could not take part in social events, 38 (47.5%) out of 80 patients had their learning abilities affected, 3 (3.75%) out of 80 patients did not have any morbidity (Figure 6). Among 54 patients who had their daily activities affected due to COM, 17 (31.48%) patients were due to underlying tinnitus, 13 (24.07%) patients due to ear discharge, 10 (18.51%) patients due of hard of hearing, 8 (14.81%) patients due to otalgia, 4 (7.40%) patients due to giddiness and 2 (3.70%) patients due to facial nerve palsy (Figure 7).

Among the above seven measures, four measures affected by COM were statistically significant which were increased financial burden, affected daily activities, could

not take part in sports activities and could not go to work (Figure 8).

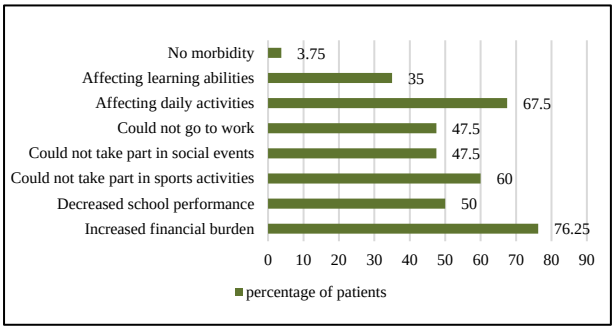


**Figure 6: Measures of morbidity distribution chart.**

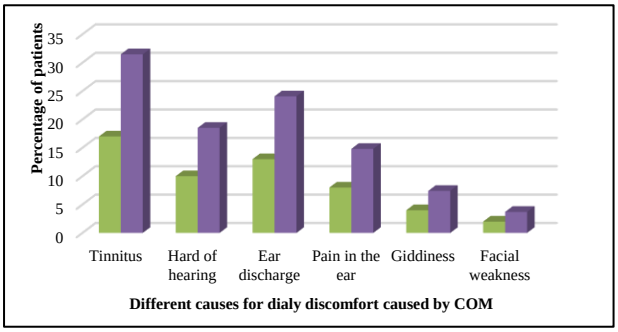


**Figure 7: Causes for affecting daily activities in COM patients.**

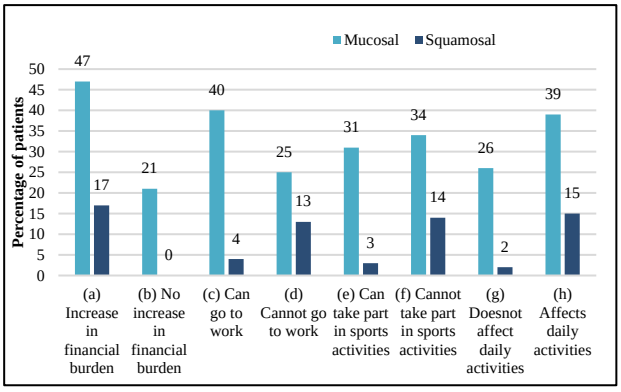


**Figure 8: Significant morbidity caused by chronic otitis media; a) and b): effect of disease on increased financial burden: p=0.0065 (highly significant), c) and and d): effect of disease on not able to go to work: p=0.005 (highly significant), e) and f): effect of disease on not able to take part in social activities: p=0.02 (significant), g) and h): effect of disease on affecting daily activities: p=0.02 (significant).**

### *Types of COM*

In current study 180 ears examined and 102 ears were affected, among them 81 ears were mucosal (64 ears active and 17 ears inactive), 21 ears were squamosal (19 ears active and 2 ears inactive) (Figure 9).

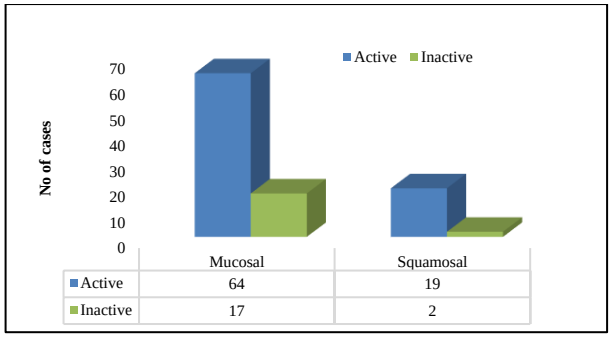


**Figure 9: Types of COM.**

### *Otoscopic and tuning fork findings*

In current study all quadrants involvement was taken in large central perforation and subtotal perforation. Among 102 affected ears, all quadrants involvement was present in 51 (50%) ears, anteroinferior quadrant (AIQ) in 22 (21.56%) ears, pars flaccida involvement in 7 (6.86%) ears, posteroinferior quadrant (PIQ) in 5 (4.90%) ears, anterosuperior quadrant (ASQ) in 4 (3.92%) ears and posterosuperior quadrant (PSQ) involvement in 3 (2.94%) ears (Figure 10). Central perforation was the most common type of perforation seen in 63 (61.76%) ears followed by subtotal perforation in 16 (15.68%) ears, granulation tissue in 11 (10.78%) ears, attic perforation in 5 (4.90%) ears, marginal perforation in 3 (2.94%) ears, retraction pocket seen in 3 (2.94 %) ears and double perforation in 1 (0.98%) ear (Figure 10).

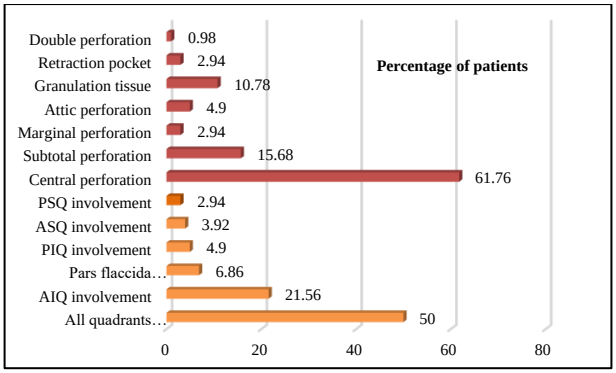


**Figure 10: Tympanic membrane findings in affected ears.**

On tuning fork tests, 44 (55%) patients had conductive hearing loss (CHL), 16 (20%) patients had severe CHL, 15 (18.75%) patients had moderate and 13 (16.25%) patients had mild CHL, 22 (27.5%) patients had mixed hearing loss, 6 (7.5%) patients had sensorineural hearing loss and 8 (10%) patients had normal hearing.

### *Complications of COM*

Only 6 patients had complications, among them 3 patients had acute labyrinthitis, 2 patients had facial nerve palsy and 1 patient had aural polyp.

A detailed nose and throat examination was done, 28 (35%) patients had no abnormality, 17 (21.25%) patients had asymptomatic DNS (deviated nasal symptom), 9 (11.25%) patients had chronic adenotonsillitis, 6 (7.5%) patients had symptomatic DNS, 6 (7.5%) patients had allergic rhinitis, 4 (5%) patients had chronic pharyngitis, 2 (2.5%) patients had chronic adenoiditis, 1 (1.25%) patient had chronic tonsillitis, 1 (1.25%) patient had acute rhinitis.

## DISCUSSION

In current study most of the patients were of 21-30 years followed by 11-20 years of age group, hence second and third decade of life is the most common age group affected by chronic otitis media. These findings were consistent with the findings of Shrestha et al.[8] However, much earlier presentation was reported by Rupa et al.[9] It was found that children are more prone due to a number of reasons such as susceptibility of upper respiratory tract infection, more horizontal nature of eustachian tube and immature immune system.[10] In present study we found a slight male preponderance, this can be attributed to the fact that male patients have been exposed to more of pollution like dust, pollen, taking bath in the pond in rural setup. These results are similar to study conducted by Abraham et al.[11,12]

In current study, majority were from a rural setup than urban setup. This was similar to study conducted by Bandyopadhyay et al.[13] Also our hospital is visited by majority of the rural patients for their health care needs. There were few predisposing factors which caused ear diseases more in rural areas than urban areas and they were poor housing, poor sanitation, poor living conditions, bathing in open ponds and malnutrition.[14] In our study, about 45% of patients belonged to socio-economic status class IV and 25% of patients were in class V which together compromises about three fourth of the study population. This was similar to previous studies.[15] A study was conducted by Parmar et al who concluded that majority of COM affected population were from upper-lower (class IV) socioeconomic group followed by lower-middle (class III) group according to modified Kuppuswamy socioeconomic status scale.[16] It is presumed that it is in the preview of the government bodies and public in general to improve these modifiable factors so that the disease burden is decreased.

It was observed that unilateral disease (right ear>left ear) was more common and similar result was reported by Saini et al.[17] We found that the past history of recurrent AOM, URTI and naso-respiratory allergies were the main trigger factors. A study conducted by Fliss et al found that a history of AOM, a parental history of COM, and crowded conditions (larger families and large day care centers) were risk factors for COM.[18] In current study it was found that the risk factors like overcrowding, malnutrition, indoor cooking, taking bath in pond and swimming resulted in a poor personal hygiene contributed to the morbidity of the disease. In the developing countries, poverty, ignorance, dearth of specialists and limited access to medical care amongst others conspire to worsen the course and complications of COM. Overcrowding, poor hygiene and nutrition and poor living conditions have been suggested as a basis for the widespread prevalence of COM in developing countries.[19-21] Seven morbidity measures were studied as mentioned earlier and was observed that COM caused statistically significant morbidity which are increased financial burden, could not take part in sports activity, could not go to work, affected daily activities. Tinnitus was found to be the most common cause which affected their daily activities followed by ear discharge and hard of hearing. COM was also found to cause other morbidities like decreased school performance, could not take part in social events and affected learning abilities. However, 3 patients did not have any morbidity. A study was conducted by Kumara et al who found increased financial burden followed by decrease in school performance were the most common morbidity caused by COM.[7]

In current study majority were mucosal type and active type. These findings were similar to study conducted by Shrestha et al who concluded that mucosal type presented more to hospital due to profuse ear discharge and squamosal type presented late due minimal ear discharge.[22] The most common complaint in this study was otorrhea with hard of hearing. These features correlated with a study done by Kumar et al.[23] Even though the pathology involved destruction of the conductive mechanism there was no patient in this study who presented solely with hard of hearing as their primary complaint. In our study majority had purulent ear discharge followed by scanty discharge. Copious mucopurulent otorrhea is usually a feature of active mucosal COM, whereas scanty, foul smelling and sometimes sanguineous varieties are seen in active squamosal COM (cholesteatoma).[24] It was observed that all ears with bloodstained ear discharge were squamosal type but all the squamosal ears did not have a bloodstained ear discharge picture. Hence blood-stained ear discharge should not be taken as a hall mark of a squamosal ear and a thorough otoscopic examination is mandatory. In our study most common was all quadrant involvement followed by anteroinferior quadrant and least being posterosuperior quadrant involvement. In a study conducted by Raushan et al, anteroinferior and posteroinferior quadrant was most commonly involved.[25] Central perforation was the most common finding, maximum being large central followed by small central and medium central perforation. A study by Nagle et al had small central perforation in 20% of cases, large central in 23% of cases and medium central in 57% of patients.[26]

It was observed that most patients had conductive type of hearing loss followed by mixed and sensorineural type. These findings are similar to study by Narve et al.[27] We

found that out of 17 patients (21 ears) with squamosal disease, 6 (28.57%) patients developed extracranial complication, most common being acute labyrinthitis followed by facial nerve palsy. There were no patients in our study who had intracranial complication. In a study conducted by Sharma et al the most common extra cranial complication was subperiosteal abscess followed by labyrinthitis and facial nerve palsy.[28] In current study the most common finding was DNS, followed by chronic adenotonsillitis and allergic rhinitis. A study was conducted by Vikram et al who concluded that a contributing disease focus in the nose or throat was found in 70.96% of complicated COM cases and in 82.4% of uncomplicated COM cases.[29]

## CONCLUSION

It was conclude that chronic otitis media is been affected by various factors such as low socioeconomic status, rural background, overcrowding, indoor cooking, malnutrition. There are certain predisposing factors like swimming habit, taking bath in pond, ear probing habit, recurrent AOM, recurrent URTI, naso-respiratory allergies which causes chronic otitis media results in various morbidity including increased financial burden, affects daily activities, affects the psychological mindset and lowers the confidence of the patient giving them a feeling of social outcast. Hence a proper education and awareness must be spread regarding these factors, maintaining personal hygiene, improving nutrition and immunity. An immediate consultation with the otorhinolaryngologist will reduce the disease progression and hence the complications. It is also the responsibility of the government bodies and public in general to improve these modifiable factors so that the disease burden is reduced.

## ACKNOWLEDGEMENTS

Authors are thankful to Dr. G. Shankar, professor and HOD, department of otorhinolaryngology and head and neck surgery, Vijayanagara institute of medical sciences, Ballari, for his constant encouragement, support and guidance.

*Funding: No funding sources*
*Conflict of interest: None declared*
*Ethical approval: The study was approved by the Institutional Ethics Committee*

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**Cite this article as:** Kishore HR, Reshma PR. Clinico-epidemiological profile of chronic otitis media at a tertiary care hospital. Int J Otorhinolaryngol Head Neck Surg 2020;6:2222-8.