

# Hearing Loss in Chronic Otitis Media Mucosal Type, Does This Have a Relation with Patient Demographic Profile, a Study in the Third World Country



Zohda Tayyaba, Sana Ansari, Mohd Aqib, Kamlesh Chandra

**Abstract:** The study was conducted to establish a relationship between hearing loss with the demographic profile in patients with chronic otitis media inactive mucosal disease. Patients with chronic otitis media (COM) inactive mucosal disease, of both sexes and different age groups were assessed and grouped based on unilateral or bilateral ear involvement; rural and urban, and based on the duration of discharge. Hearing loss (HL) was measured by calculating the air-bone gap via pure-tone audiometry. The study included 210 ears, a total of 161 patients. The age group of patients ranged from 15 to 55 years. Maximum proportion (53 %) in younger age groups (15-25 years) but no relation with HL was seen. Incidence was higher in females, with significantly greater HL. Greater HL in bilateral involvement. 51% right ear and 49% left ear involvement; 59 % from the rural area, 41 % from urban areas; no significant difference in HL. Duration of ear discharge varied from 2 months to several years; maximum proportion (41%) for more than 10 years, with maximum HL (27.18 dB). Hence, it was concluded that high incidence of COM was in patients in the younger age range, in females, in rural areas, and in unilateral ear involvement. HL was significantly higher with bilateral involvement and in the female population. Greater HL was associated with longer discharging ears.

**Keywords:** Chronic Otitis Media, Hearing Loss, Gender Distribution, Rural, Urban, Unilateral, Bilateral

## I. INTRODUCTION

Each year, approximately 21,000 people; i.e., 33 per million people die due to complications of COM, globally. WHO estimates around 65-330 million people are affected by COM worldwide,

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of which about 50% suffer from hearing loss [1,2]. Chronic otitis media (COM) can be defined as an inflammatory process in the middle ear cleft that leads long term, or more often permanent changes in the tympanic membrane. Mucosal COM refers to permanent perforation of the pars tensa with or without inflamed middle ear mucosa or pus in the tympanic cavity [2]. Patients with COM presents with otorrhoea, and hearing loss, mild to moderate. Hearing loss is usually conductive type, however sensorineural hearing loss can also occur [2,3]. The aetiology and pathogenesis of otitis media are multifactorial and include genetic, infections, allergy, environmental, social, and rural factors, and Eustachian tube dysfunction. The incidence of COM varies among different populations; in developed or developing countries and is dependent on socioeconomic factors such as housing conditions, overcrowding, nutrition factor, daycare attendance, upper respiratory tract infection, and eustachian tube dysfunction among others[2,4,5]. The study aims to make a quantitative estimate of hearing loss in patients of COM mucosal disease and to correlate with the demographic profile of the patient.

## II. REVIEW OF LITERATURE

Chronic otitis media is one of the most common ailments faced by otorhinolaryngologists afflicting children and adults worldwide. It is said to be affecting more children or young adults more, especially of poor socioeconomic status as access to health is poor alongwith negligent behaviour. In the research conducted by Maharjan et al where they studied tympanic membrane perforation by chronic otitis media mucosal disease, the examination was carried out only by a single examiner to rule out any variation. They worked with a total of 100 patients and 119 ears. The mean age of patients in their study was 34 years, with a little more involvement of females and an almost equal ratio of males and females ears [4]. Nahata et al studied 63 patients and found that the maximum, i.e., 38 % of the total study population were from the 15-24 years age group. Females were more afflicted than males and bilateral involvement was more common [6]. Aneesa et al in their study of 49 patients, encountered 70 perforated drums. They encountered more male patients (29) and bilateral ear involvement (21 ears), left more than right (19 left, 9 right). Also, the most common age group found was 20-30 years [7]. However, in all the studies mentioned, the relationship of hearing loss with socioeconomic profiles was left untouched.



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Also, much significance is not given to patients coming from rural or urban areas, which is researched in this study.

### III. MATERIALS AND METHODS

The study was a prospective descriptive hospital-based study, including patients attending ENT OPD or admitted in the IPD, carried out for a period of 24 months from Oct'19 to Oct'21. The study was conducted in a government hospital in North India.

#### i. Inclusion criteria

- Patients of age 15 years and above.

#### ii. Exclusion criteria

- Patients below 15 years of age.
- Patients with the presence of cholesteatoma.
- Patients with the presence of mucopus in the middle ear cleft.
- Patients with the presence of any sensorineural hearing loss.
- Patients with the presence of marginal perforation.
- Patients with the presence of tympanosclerotic patches.
- Patients with healed otitis media.

Detailed history and ENT examination were conducted. Hearing loss was evaluated with tuning fork tests and pure-

tone audiometry. The air-bone gap was calculated at 500, 1000, and 2000 Hz frequency, and an average of these were taken as hearing loss.

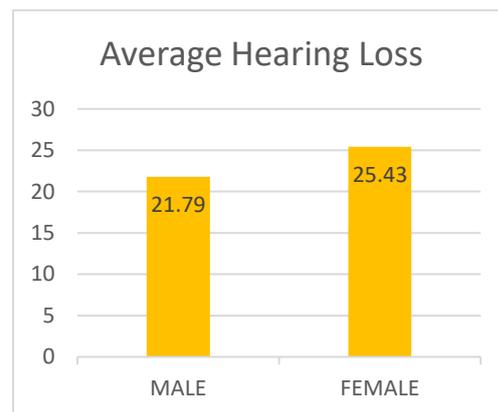
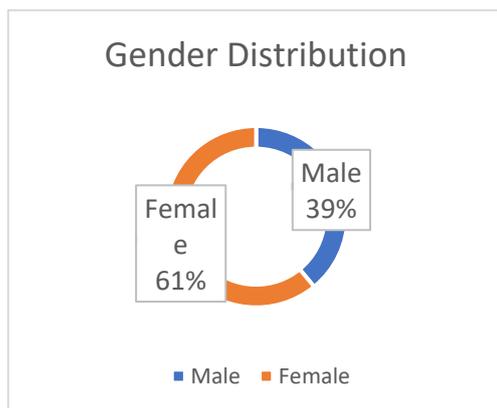
### IV. RESULTS

The study included 210 ears, a total of 161 patients. The age group of patients in the study ranged from 15 to 55 years. Maximum hearing loss was seen in the 35-45 years age group, followed by the age group 45 years and above.

**Table 1: Age-wise Distribution of total patients**

| Age Group (in years) | Total no. of ears | Percentage | Average Hearing Loss (in dB) |
|----------------------|-------------------|------------|------------------------------|
| 15-25                | 111               | 53%        | 24.44                        |
| 25-35                | 52                | 25%        | 21.59                        |
| 35-45                | 31                | 15%        | 25.94                        |
| 45 and above         | 16                | 7%         | 25.28                        |
| Total                | 210               | 100        | -                            |

The incidence of chronic otitis media was higher in females 61% with significantly higher hearing loss as compared to males (t-test).



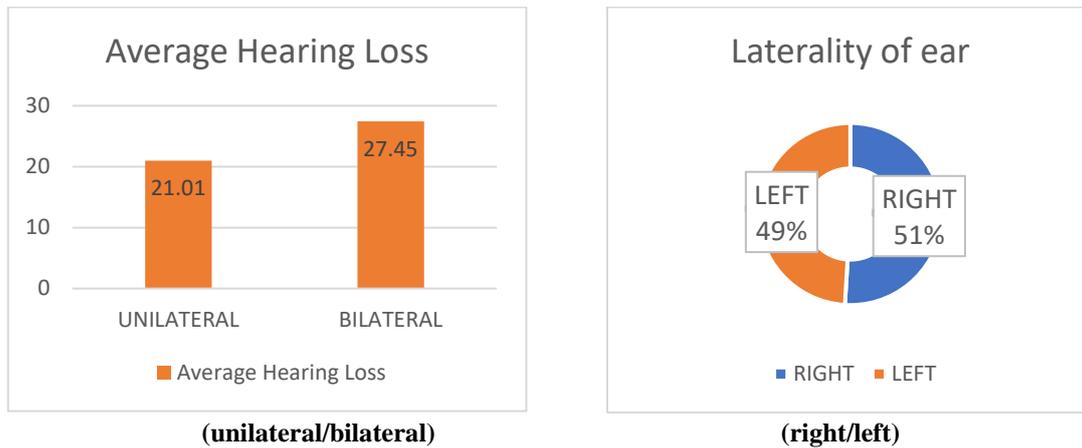
**Figure 1, 2: Gender-wise Distribution of total patients and Average Hearing Loss**

Of 161 patients, 49 patients had involvement of bilateral ear (47%), with significantly higher hearing loss. The right ear comprised 51 % of the total study group, with no significant difference in hearing loss between the right (23.37 dB) and the left ear (24.68 dB).

**Table 2: Distribution according to Laterality**

| Groups     | Total No. of Ears | Percentage | Average Hearing Loss (in dB) |
|------------|-------------------|------------|------------------------------|
| Unilateral | 112               | 53%        | 21.01                        |
| Bilateral  | 98                | 47%        | 27.45                        |





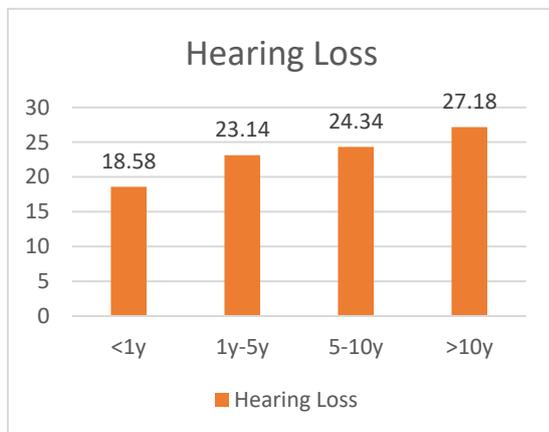
**Figure 3,4: Average Hearing Loss and Distribution according to Laterality**

59 % of the study population were from rural areas, while only 86 ears, 41 % belonged to urban areas. Hearing loss was an average of 24.41 dB and 23.44 dB in the rural and urban populations, respectively; the difference was not significant.

**Table 3: Average Hearing Loss according to Rural/Urban distribution**

| Groups | No. of ears | Percentage | Average Hearing Loss (in dB) |
|--------|-------------|------------|------------------------------|
| Rural  | 124         | 41%        | 24.41                        |
| Urban  | 86          | 59%        | 23.44                        |

42 ears (20%) had ear discharge for only less than 1 year and a maximum proportion was noted with ears having a history of ear discharge for more than 10 years (41%). Minimum hearing loss (18.58 dB) was seen in patients having discharge for less than 1 year, with subsequently significant increasing hearing loss with increasing duration of discharge.



**Figure 5: Average Hearing Loss according to Duration of Discharge**

**V. DISCUSSION**

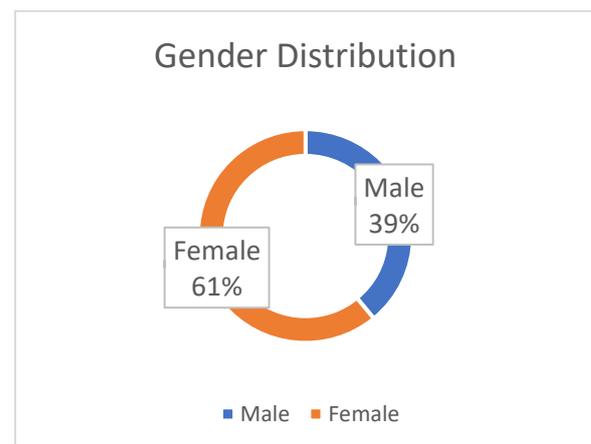
According to our findings, patients in the younger age range (15-25 years) had the highest incidence of COM. Our research matched those of Nahata et al where 38 % of the total study population was from the 15-24 years age group[6]. This could be because of the health-seeking behaviour of the younger generation and increasing awareness of various disorders, and this age group being more cautious of hearing loss due to professional needs or due to marriageable age. In addition, the number of females in the research group outnumbered the number of males which was also seen by Maharjan et al, Nahata et al [4,6]. Although bilateral involvement had somewhat less proportion in our study

group, hearing loss was significantly higher which could be due to general health conditions, like adenoid hypertrophy or tonsillar hypertrophy, or recurrent URTIs, leading to a longer duration of disease and greater hearing loss. It was found that the longer the duration of discharge, the greater the hearing loss, as supported by the studies by Maharjan et al, Aneesa et al [4,7]. With a longer duration of ear discharge, air conduction hearing levels deteriorates greatly, thus implying that whenever possible earlier interventions should be made to control and treat the disease, so that outcome comes out to be preferable. However, Sood et al didn't find any correlation of hearing loss with the duration of ear discharge [8].

**VI. CONCLUSION**

A high incidence of COM was in patients in the younger age range, in females, in rural areas, and in unilateral ear involvement. However, hearing loss was greater with bilateral involvement. Also, greater hearing loss was associated with a longer discharging ear. Hence, despite having a high incidence, no difference in hearing loss was seen between different genders or urban or rural populations.

**FIGURES/ GRAPHS**



**Figure 1: Gender-wise Distribution of total patients**

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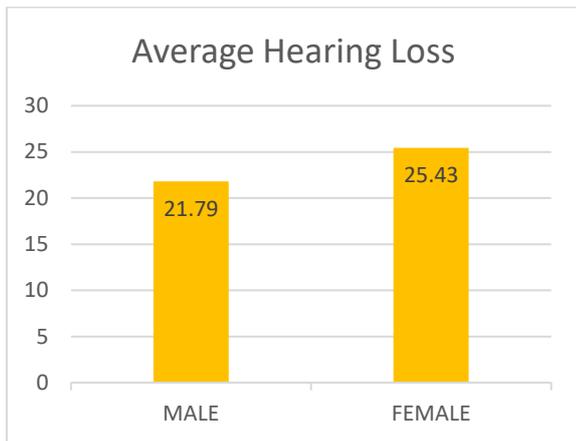


Figure 2: Gender-wise Distribution of Hearing Loss

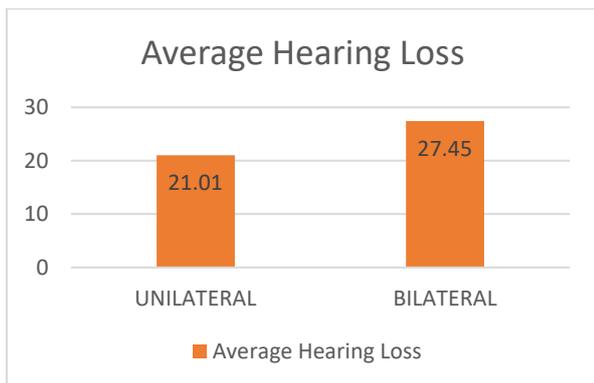


Figure 3: Average Hearing Loss according to Laterality (unilateral/bilateral)

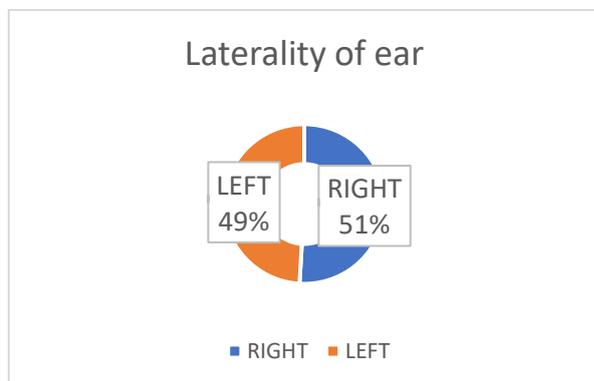


Figure 4: Distribution according to Laterality (right/left)

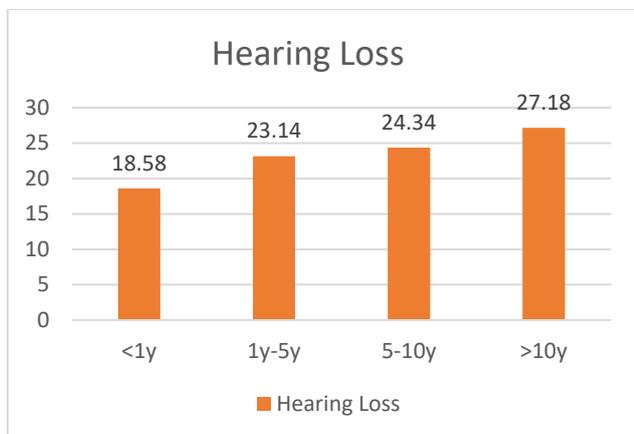


Figure 5: Average Hearing Loss according to Duration of Discharge

## TABLES

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## DECLARATION STATEMENT

|  |  |
|--|--|
| Funding/ Grants/ Financial Support                       | No. I didn't receive any funding.  |
| Conflicts of Interest/ Competing Interests               | No conflicts of interest to the best of our knowledge.   |
| Ethical Approval and Consent to Participate              | The study was approved by Institutional Ethics Committee, JNMCH, AMU. All participants gave written informed consent for the participation in the study. |
| Availability of Data and Material/ Data Access Statement | Not relevant.  |
| Authors Contributions                                    | All authors have equal participation in this article.  |

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neck surgery cases by the ENT surgeons, doesn't backs away from any complication in the OR or in the academic endeavours.

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years, he has been awarded numerous facilitations and is known to be a generous teacher, guiding budding surgeons all the way. The author had a particular likeness to the Rhinology cases, but this didn't hampered his research in the field of otology, as he has more than half the researches in the respective field. An academican through and through promoted head and