

ORIGINAL RESEARCH

Prevalence of middle ear diseases in a tertiary care centre in eastern Uttar Pradesh

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ABSTRACT

Background- Hearing loss and ear diseases can present at birth or acquired as a result of illness, middle-ear disease, injury, age, ototoxic medications, and/or induced by exposure to loud sound. People living with hearing impairment face problems in language acquisition, education, employment and overall wellbeing.

Objectives - This study aimed to assess the prevalence and profile of middle ear diseases in patients coming to tertiary care centre and teaching hospital in Varanasi district of Uttar Pradesh.

Methods -A retrospective study was carried out at a tertiary care centre and teaching hospital in Varanasi. The study involved patients of all age groups with ear disease coming to Ear Nose Throat Out Patient Department whose records were registered. Patients with external ear disease, inner ear disease, and those coming to emergency with trauma were excluded from the study. Institutional Review Committee clearance was taken.

Result -A total of 4514 patients aged between 10 months and 88 years underwent examinations including otoscopy, examination under microscope, pure tone audiometry and impedance audiometry. Out of these 4514 patients, 453 were diagnosed with middle ear diseases which is 10.06 % of patients attending ENT OPD.

Conclusion -In this study it is seen that chronic otitis media (mucosal type) is the most common among middle ear diseases and most patients were of age group 16-30 years.

Keywords- Otitis media, Mucosal, Squamosal

INTRODUCTION

A large number of patients attending ENT OPD is due to ear diseases. Ear diseases are one of the leading contributors to years lived with incapacity, with over five percent of the world's population (360 million people) presently living with a disabling hearing loss.¹ Symptoms include otalgia, aural fullness, ear discharge, tinnitus and hard of hearing. Hearing impairment can result from ear disease affecting the middle ear (conductive hearing loss), inner ear or cochlear nerve (sensorineural hearing loss), or both (mixed hearing loss). Middle ear diseases are an important cause of preventable hearing loss, particularly in the developing world², and a reason of great concern, particularly in children, as it may have long-term effects on early communication, language development, auditory processing, psychosocial and cognitive development, and academic progress and accomplishments³.

Otitis media is the most common cause of temporary hearing impairment^{4,5} and refers to a class of inflammatory conditions of the middle ear. It is a spectrum of different conditions, including: acute otitis media with or without perforation; otitis media with effusion or glue ear. A perforated tympanic membrane may be associated with a new episode of acute otitis media or may be chronic.

The Eustachian tube (ET) is part of a system including the nose, palate, rhino-pharynx and middle ear spaces.⁶ The tympanic cavity and mastoid cells are interconnected and allow for gas exchange and pressure equalization. ET plays an important role in various middle ear pathologies.⁷⁻⁹ Significant uncertainties remain in the understanding of ET functioning due to its complex anatomy, multiple functions and impact of intrinsic and external factors.^{10,11} The term Eustachian tube dysfunction (ETD) describes impairment of ET function leading to a various symptoms and clinical findings. The condition may or may not lead to detectable middle ear pathologies. ET dysfunction can be either acute or chronic. Acute ETD occurs during nasal congestion due to a common cold or allergic rhinitis. ETD lasting longer than 3 months consecutively is considered chronic. Chronic ETD can be due to obstruction or patulous Eustachian tube (PET).¹²

Otosclerosis is a hereditary disorder of bone metabolism of otic capsule enchondral bone that is characterized by disordered resorption and deposition of bone.^{13,14} Clinical otosclerosis refers to lesions that affect the stapes, stapediovestibular joint or round window membrane and thus cause conductive hearing loss. Cochlear otosclerosis refers to lesions involving the cochlear endosteum without affecting the stapes or the stapediovestibular joint, causing sensorineural hearing loss. Histologic otosclerosis refers to histopathological lesions that do not affect the stapes, stapediovestibular joint or cochlear endosteum, and thus remain asymptomatic.¹⁴

Among the patients coming to ENT OPD, many present with middle ear diseases with hearing loss and debilitating daily life. Therefore there is a need to carry out investigation in this region to determine the proportion of ear diseases in different age groups and their sex distribution so that early diagnosis can be made and accordingly early treatment to be advised.

AIM

To determine the prevalence of middle ear diseases in patients coming to tertiary care center and teaching hospital of Varanasi districts of Uttar Pradesh.

METHOD

This is a retrospective study done in ENT OPD of Heritage Institute of Medical Sciences, Varanasi, UP. The study was conducted for a period of 15 months during Nov 2020 to Jan 2022 after obtaining ethical clearance from the Institutional Review Committee. Total numbers of patients included in the study are the patients coming to ENT OPD of HIMS, Varanasi whose informed consent were taken.

Detailed history was taken and thorough clinical examination was done including otoscopy, rhinoscopy, oral cavity, throat examination, and Tuning fork test. Required investigations were done including Pure Tone Audiometry, Impedance audiometry, X-ray mastoids, HighResolution Computed Tomography temporal bone and then diagnosis was made. Patients with external ear disease, inner ear disease, and those coming to emergency with trauma were excluded from the study. Statistical analysis was done using the mean, standard deviation and percentage. SPSS version 20 was used for the analysis. Calculations of various ear morbidities were done and demographic profiles were produced.

RESULT

As per data collected, out of all the patients which came to ENT OPD during the period of Nov 2020 to Jan 2022, which is 4514, patients who presented with middle ear diseases are 453 i.e., 10.03% (Table 1).

Table 1:- Demography of the Patient

| | |
|--|------|
| Total no of patients in ENT OPD | 4514 |
| Total no. of patients of ear diseases | 829 |
| Total no. of patients of middle ear diseases | 453 |
| OTHER DISEASES | 3685 |

Based on age-wise distribution, 73(16.11%) patients belonged to age-group of 0-15 years, 199(43.92%) patients were between 16-30 years, 118(26.04%) patients were between 31-45 years, 40(8.83%) patients were of age group 46-60 years and 23(5.07%) patients were above 60 years of age (Table 2).

Table 2:- Age wise distribution of patient

| Age (in years) | COM (MUCOSAL) | COM (SQUAMOSAL) | COM (MUCOSAL/SQUAMOSAL) | AOM | OME | ETD | OTOSCLEROSIS | TOTAL |
|----------------|---------------|-----------------|-------------------------|-----------|----------|-----------|--------------|--------------|
| 0-15 | 37(15.81) | 3(7.5) | 2(18.18) | 20(28.17) | 4(23.53) | 6(9.52) | 1(5.88) | 73(16.11%) |
| 16-30 | 108(46.15) | 17(42.5) | 2(18.18) | 31(43.66) | 4(23.53) | 26(41.27) | 11(64.71) | 199 (43.92%) |
| 31-45 | 56(23.93) | 13(32.5) | 3(27.27) | 11(15.49) | 4(23.53) | 26(41.27) | 5(29.41) | 118(26.05%) |
| 46-60 | 20(8.55) | 5(12.5) | 2(18.18) | 7(9.86) | 3(17.65) | 3(4.76) | 0 | 40(8.83%) |
| 60 ABOVE | 13(5.55) | 2(5) | 2(18.18) | 2(2.82) | 2(11.76) | 2(3.17) | 0 | 23(5.08%) |

Out of total patients 68.65% patients presented with unilateral disease and 31.35% patients presented with bilateral disease. (Table 3)

Table 3:- Side of Disease

| S no. | Diseases | Unilateral (%) | Bilateral (%) | Total cases |
|-------|------------------------|----------------|---------------|-------------|
| 1 | COM(MUCOSAL) | 173(73.93) | 61(26.07) | 234 (51.65) |
| 2 | COM(SQUAMOSAL) | 31(77.5) | 9(22.5) | 40 (8.83) |
| 3 | COM(MUCOSAL/SQUAMOSAL) | 0 | 11(100) | 11 (2.42) |
| 4 | AOM | 64(90.14) | 7(9.86) | 71 (15.67) |
| 5 | OME | 13(76.47) | 4(23.53) | 17 (3.75) |
| 6 | ETD | 22(34.92) | 41(65.08) | 63 (13.90) |
| 7 | OTOSCLEROSIS | 8(47.06) | 9(52.94) | 17 (3.75) |
| | TOTAL | 311 (68.65%) | 142 (31.35%) | 453 |

Out of these 453 patients 227 (50.11%) were male and 226 (49.88%) were female. As per disease distribution 234 (51.65%) patients were of COM mucosal type out of which 104 (44.44%) were male and 130 (55.56%) were female. 40 (8.83%) patients presented with COM squamosal type out of which 24 (60%) were male and 16(40%) were female. Some patients presented with mucosal disease in one ear and squamosal type in the other which

were 11(2.42%) in no. out of which 5(45.45%) were male and 6 (54.55%) were female. 71(15.67%) patients presented with Acute otitis media out of which 39(54.93%) were male and 32(45.07%) were female. 17 patients out of all were diagnosed with otitis media with effusion (3.75%) out of which 15(88.25%) were female and 2(11.76%) were male. 63(13.90%) patients out of all cases were of Eustachian tube dysfunction out of which 33(52.38%) were male and 30(47.62%) were female. 17(3.75%) patients were diagnosed with otosclerosis out of which 7(41.17%) were male and 10(58.82%) were female(Table4).

Table 4:- Disease Wise Distribution of patient

| S. No. | Diseases | Male (%) | Female (%) | Total cases |
|--------|------------------------|-------------|-------------|-------------|
| 1 | COM Mucosal | 104 (44.44) | 130 (55.56) | 234 (51.65) |
| 2 | COM Squamosal | 24(60) | 16 (40) | 40 (8.83) |
| 3 | CSOM Mucosal/Squamosal | 5 (45.45) | 6 (54.55) | 11 (2.42) |
| 4 | AOM | 39 (54.93) | 32 (45.07) | 71 (15.67) |
| 5 | OME | 15 (88.24) | 2 (11.76) | 17 (3.75) |
| 6 | ETD | 33 (52.38) | 30 (47.62) | 63 (13.90) |
| 7 | Otosclerosis | 7 (41.17) | 10 (58.82) | 17 (3.75) |
| | Total | 227 (50.11) | 226 (49.88) | 453 |

DISCUSSION

Even after enhancements in public health and medical care facilities, middle ear disorders remain prevalent around the world.

According to Bluestone,¹⁵ the populations in whom chronic otitis media have been reported to be highest (12–46 percent) are: the Inuit of Alaska, Canada and Greenland; Australian Aborigines; and certain Native Americans.

A study of middle-ear disease in the adult British population states the prevalence of inactive otitis media and active otitis media to be 2.6 per cent and 1.5 per cent respectively.¹⁶

Murat Karaman et al¹⁷ carried out a study on 100 patients of CSOM, female:male ratio was 1.7:1. In another study AlirezaKarimiYazdi et al¹⁸ observed, male:female ratio as 1:2. Mohammed Shafiqul Islam et al¹⁹ conducted a study on 150 patients of CSOM and observed that 89 cases were of males (59.33%) and 61 cases of females (40.67%).

Chadha et al. (2006)²⁰ carried out a study to compare the prevalence of ear diseases in 1500 school children of lower and higher socioeconomic strata in the city of Delhi. The study reported a 19.6 percent prevalence of ear disease in the lower strata of that society as compared to 2.13 percent in higher income group.

In our study we observed that 10.06 % of patients attending ENT OPD were of middle ear diseases and out of all the middle ear diseases percentage of chronic otitis media in our hospital is 62.91 % of which mucosal type are 51.65 % and squamosal type are 8.83 % and 2.42 % of patients presented with mucosal type of disease in one ear and squamosal type of disease in other ear. Females were affected more with mucosal type of disease, male-female ratio being 1:1.2. In squamosal type of disease male-female ratio was 1.5:1. Second most common disease was acute otitis media found in 15.67% of population. A study of middle-ear disease in the adult British population states the prevalence of inactive otitis media and active otitis media to be 2.6 percent and 1.5 percent respectively.

LIMITATION AND FUTURE SCOPE OF THE STUDY

High prevalence of ear diseases is a significant publichealth challenge which needs to be addressed in organised way to promote ear health within communities. There was no limitation of the study felt as our study met all the requirements of aim of the study except the need of further studies on large population.

CONCLUSION

In our hospital the most common middle ear disease was chronic otitis media (mucosal type) followed by acute otitis media. The prevalence of Chronic Otitis Media and other middle ear diseases varies widely and causes a serious burden of illness globally leading to hearing impairment. As chronic Otitis Media is a condition of serious concern, future research may help to understand the underlying mechanisms for better therapeutic and prevention strategies. Thus further studies on management of middle ear diseases will help in prevention of hearing impairment.

ETHICS DECLARATIONS**CONFLICT OF INTEREST**

All the authors declare they have no conflicts of interest and have not received any funding.

ETHICAL STATEMENT

Before starting the study ethical clearance was taken from institutional ethical committee as per Declaration of Helsinki. All data of the patients maintained confidentiality and it was not disclosed.

CONSENT FOR PUBLICATION

Informed consent was taken by all the patients before enrolment into the study.

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