

Study of Correlation between Duration of Chronic Suppurative Otitis Media and Sensorineural Hearing Loss

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ABSTRACT

Introduction: Hearing loss due to chronic suppurative otitis media (CSOM) is a public health problem especially in developing country like India. Aim of present study was to find out the correlation between sensorineural hearing loss and duration of CSOM.

Material and methods: Present study was a prospective observational study done on 100 patients who attended ENT OPD in tertiary care hospital in Banda from July 2018 to January 2019. Inclusion and exclusion criteria were applied. Detailed history was taken and duration of the disease was noted. Pure tone audiometry was done and values of hearing loss were recorded.

Results: Out of 100 patients, 76% developed purely conductive hearing loss (CHL) while 24% patients had mixed hearing loss (MHL). Patients with 4- 6 years of disease duration had maximum 50 dB mixed hearing loss, while the patients with more than 6 years of CSOM had maximum 61 dB mixed hearing loss.

Conclusion: There is correlation between sensorineural hearing loss and duration of chronic suppurative otitis media. In SNHL, higher frequencies are more involved in comparison of lower frequency.

Keywords: Chronic Suppurative Otitis Media, Sensorineural Hearing Loss, Duration, Conductive Hearing Loss

INTRODUCTION

Chronic suppurative otitis media (CSOM) is defined as chronic inflammation of the middle ear fossa in which discharge occurs through perforated tympanic membrane. CSOM is one of the important causes of acquired hearing loss¹ and it is considered most chronic infectious disease in children in developing countries like India.² In children, hearing loss results in impaired speech skill development. It affects quality of life in adults and results in psychological problems.³

CSOM generally results in conductive type of hearing loss due to rupture of tympanic membrane and changes in ossicular chain.⁴ Recently studies done by various authors⁵⁻⁷ have observed sensorineural hearing loss (SNHL) in CSOM patients showing impaired cochlear function. Several studies investigated the correlation of SNHL with duration of CSOM, patient's age, presence of Cholesteatoma etc. Kolo et al.⁸ found no correlation between patient's age and duration of otorrhea with SNHL in CSOM patients. Raqib et al.⁹ and Kaur et al.¹⁰ observed a significant relationship between SNHL and disease duration. Therefore aim of present study was to find out the correlation between sensorineural hearing

loss and duration of CSOM.

MATERIAL AND METHODS

Present study was a prospective observational study done on 100 patients who attended ENT OPD in tertiary care hospital in Banda from July 2018 to January 2019.

Inclusion criteria

1. Patients aged between 10-55 years.
2. History of unilateral ear discharge for at least 3 months.
3. Patients with normal hearing on contralateral ear.
4. Show willingness to give informed consent.

Exclusion criteria:

1. Patients having history of head trauma and prior ear surgery.
2. Familial history of hearing loss.
3. Chronic exposure to loud noise or uncontrolled systemic conditions.
4. Previous exposure to ototoxic drugs.

Detailed history was taken and duration of the disease was noted. Pure tone audiometry was done and values of hearing loss were recorded.

RESULTS

Figure 1 shows that out of 100 patients, about three fourth (76%) developed purely conductive hearing loss (CHL) while about one fourth (24%) patients had mixed hearing loss (MHL).

Figure 2 shows relation between maximum hearing loss and duration of CSOM in present study. Cases with duration of CSOM < 2 years show maximum hearing loss of 25 db of conductive type and duration of 2-4 years show 32 db hearing loss. Patients having duration of CSOM up to 4 years don't show sensorineural type of hearing loss. Out of 24 patients, 2 patients had disease duration of 4-6 years and 22 patients had the disease for more than 6 years. Patients with 4- 6 years of disease duration had maximum 50 dB mixed hearing loss,

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How to cite this article: Chaudhary K, Verma JK. Study of correlation between duration of chronic suppurative otitis media and sensorineural hearing loss. International Journal of Contemporary Medical Research 2021;8(3):C4-C6.

DOI: <http://dx.doi.org/10.21276/ijcmr.2021.8.3.19>



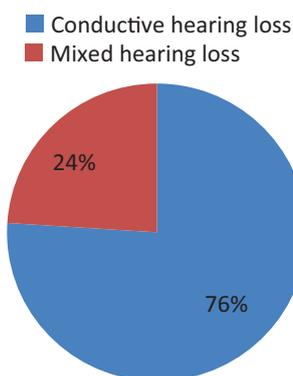


Figure-1: shows that out of 100 patients, about three fourth (76%) developed purely conductive hearing loss (CHL) while about one fourth (24%) patients had mixed hearing loss (MHL).

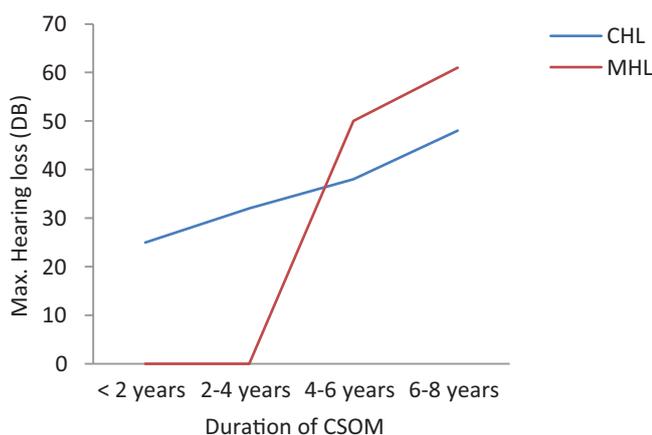


Figure-2: Maximum hearing loss in relation to duration of CSOM

while the patients with more than 6 years of CSOM had maximum 61 dB mixed hearing loss. Above figure shows that degree of hearing loss increases with duration of CSOM.

DISCUSSION

Generally conductive type of hearing loss occurs in CSOM. Recently studies done by various authors⁵⁻⁷ have observed sensorineural hearing loss (SNHL) in CSOM patients showing impaired cochlear function. Nanda MS et al.¹¹ observed higher incidence of SNHL in patients with longer duration of disease (30.3% in patients with disease duration more than 6-10 years) as compared to shorter duration. Kaur et al.¹⁰ also observed that incidence of SNHL increases with the longer duration of CSOM. In their study 24% cases of CSOM were having SNHL which is similar to present study. In a study done by Prasad B and Gupta R¹² shows significant increase in incidence of SNHL (75%) with increase in duration of ear discharge (>10 years).

Azevedo AF et al.¹³ also found correlation of development of SNHL in CSOM with longer duration of disease. Study by Sharma K et al.¹⁴ showed that incidence & severity of SNHL increases with the prolongation of duration of disease. Gulati et al.¹⁵ observed that all patients with 16-20 years duration of disease developed Sensorineural hearing loss. Degree of hearing loss is determined by various parameters like size & site of tympanic membrane perforation, ossicle damage, Cholesteatoma etc.

Study done by Razooqi A N et al.¹⁶ showed that the increase in hearing loss with increasing duration of pathology was statistically significant. Study done by Cusimano F et al.¹⁷ observed that there is increased mean bone conduction difference of 5.5 dB for every ten years duration of COM. Our study found much higher incidence of SNHL with the increase in the duration of CSOM.

Study done by Paparella et al.⁶ studied the role of round window in transmission of inflammation from middle ear to inner ear. In CSOM, anatomical position and characteristic of round window encourages by passage of inflammatory agents through round window which may lead to SNHL. He also showed effects on speech frequency in bone conduction thresholds in chronic otitis media. Similar results (more higher frequency loss compared to lower frequencies) were observed by MacAndie et al.⁷ Pathology behind is that in CSOM, chronic inflammation may produce circulatory changes like vasodilatation and vasoconstriction of the mucosal vessels of the round window membrane. Hair cells located closer to the round window are responsible for higher frequency hearing and more affected in chronic inflammation of CSOM.

Levine et al.¹⁸ observed small but statistically significant correlation between patient's age and SNHL in CSOM. SNHL incidence in CSOM is maximum in active stage of the disease in comparison of inactive and quiescent stage. Presence of active discharge causes more toxins reaching inner ear through round window resulting in more damage to inner ear as compared to inactive stage.

CONCLUSION

On the basis of results of present study, we can conclude that there is correlation between sensorineural hearing loss and duration of chronic suppurative otitis media. Incidence of sensorineural hearing loss increases with increase in duration of chronic suppurative otitis media. In SHNL, higher frequencies are more involved in comparison of lower study. Therefore early diagnosis and timely intervention is necessary to stop further hearing loss.

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Source of Support: Nil; **Conflict of Interest:** None

Submitted: 24-01-2021; **Accepted:** 21-02-2021; **Published:** 26-03-2021