

# A Study of Sensorineural Hearing Loss in Chronic Suppurative Otitis Media Patients - On use of Topical Ototoxic Ear Drops

V.P. Narve<sup>1</sup>, Shashiraj Ingale<sup>2</sup>, Megha Maurya<sup>3</sup>

## ABSTRACT

**Introduction:** The hearing impairment in patients with CSOM has generally been observed to be of conductive type and less of sensorineural type. Since long attempts have been made to establish relationship of hearing loss in csom patients with use of topical ear drops.

**Material and Methods:** The prospective study carried out in 100 patients presented in department of ENT, G R Medical College, Gwalior from february 2015 to September 2016 with complaint impaired hearing. Objective is to study incidence of sensorineural hearing loss in chronic suppurative otitis media patients on use of topical ototoxic ear drops. After taking detailed history of the patient, complete examination of ear, nose and throat has been carried out. Puretone audiometry is done.

**Result:** In present series of 100 patients with CSOM, 98 patients were using topical ear drops and 2 patients were not using any topical medications. Among the patient with only pure SNHL, 13 patients (86.7%) were using ototoxic ear drops and only 2 patients (13.3%) were using non-ototoxic ear drops.

**Conclusion:** There was increase in incidence of SNHL in CSOM patients with use of topical ototoxic ear drops.

**Keywords:** Sensorineural Hearing Loss (SNHL), Chronic Suppurative Otitis Media (CSOM).

was carried out during the study period from February 2015 to August 2016, 100 patients with CSOM was selected consecutively as and when they present during the study period based on inclusion and exclusion criteria.

**Inclusion criteria:** All CSOM patients with History of unilateral recurrent otorrhea with use of topical ear drops is the main inclusion criteria coming to ENT out-patient department in GR Medical College in the present year of study and Patient with Tuning fork test, ABC decreased.

**Exclusion criteria:** Patients in whom hearing loss could be attributed to reasons other than chronic suppurative otitis media such as Patients age <12 are excluded to eliminate the possibility of inaccuracies and non-co-operative of audiological testing in children and >55 years of age were excluded because of the increased incidence of presbycusis in this age group, history of previous otologic surgery, familial hearing loss, prolonged exposure to noise, head trauma, cases with use of ototoxic systemic drugs, not giving consent for the relevant investigation will be excluded from this study.

**History Taking and Examination** - A proforma of ENT examination was filled for each patient and documented. Consent of the patient was taken for clinical examination and required investigations.

**Special investigations:** All the patients were being underwent complete history taking and clinical examination. Pure tone audiometry was performed by a calibrated audiometer in a sound-proof room and narrow band masking was used when appropriate. Pure tone air threshold (AC) and pure tone bone conduction (BC) threshold audiometry was done. The hearing of the patient was assessed by pure tone audiogram (type and degree of hearing loss recorded). Hearing loss upto 20 dB is considered normal, 21-40 dB mild, 40-55 dB moderate, 55-70 dB moderately severe, 70-90 dB severe, and above 90 dB as profound. Categorical data incidence was then analysed

## INTRODUCTION

The hearing impairment in patients with CSOM has generally been observed to be of conductive type and less of sensorineural type. Since long attempts have been made to establish relationship of hearing loss in csom patients with use of topical ear drops. The role of chronic inflammatory disease of the middle ear as a cause of SNHL is still debatable. In this study cases with use of topical ear drops were included as their use was found to be common in chronic otitis media. The different ear drops used by patients showed large variety of nature of contents and varying period of use. Many patients could not inform the name of the drops they had used in past. However, several investigators have reported a loss of cochlear function due to absorption of toxins across the round window, and hence SNHL does occur as a common sequel of long standing CSOM. Therefore the study was undertaken to analyse clinically the incidence of sensorineural hearing loss in CSOM patients in association with use of topical ototoxic ear drops.

## MATERIAL AND METHODS

The present study entitled "A study of sensorineural hearing loss in chronic suppurative otitis media patients-on use of topical ototoxic ear drops" coming to ENT out-patient department in GR Medical College. A cross sectional study

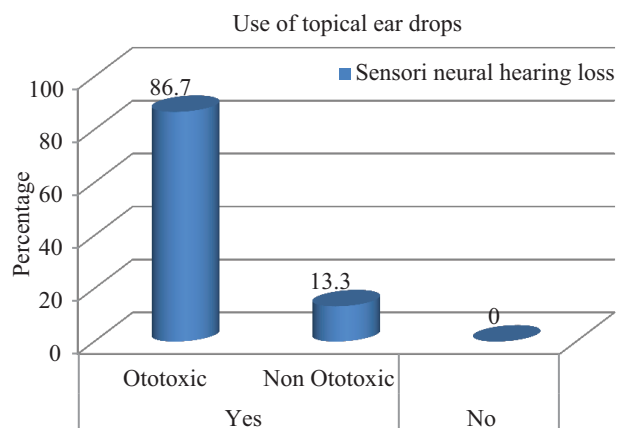
<sup>1</sup>Associate Professor, Department of ENT, <sup>2</sup>Senior Resident, Department of ENT, <sup>3</sup>Resident Postgraduate, Gajra Raja Medical College and Jaya Arogya Hospital, Lashkar, Gwalior-474009 (MP), India

**Corresponding author:** Dr. Shashiraj Ingale, Senior Resident, Department of E.N.T., G.R.M.C. Gwalior 474009. (MP), India.

**How to cite this article:** Shashiraj Ingale, V.P. Narve, Megha Maurya. A study of sensorineural hearing loss in chronic suppurative otitis media patients - on use of topical ototoxic ear drops. International Journal of Contemporary Medical Research 2018;5(3):C1-C3.

Pure Tone Audiometry Type	Yes		NO	Total
	Ototoxic Drop	Non –ototoxic Drop		
SNHL	13(86.7%)	2(13.3%)	0	15(100%)
MHL	7	76	2	85
Total				100

**Table-1:** Use of topical ear drops



**Figure-1:** Use of Topical ear drop

with respect of topical use of ear drops in CSOM patients on the development of sensorineural hearing loss.

## RESULTS

**Use of topical ear drops:** Of 100 patients in the present study 98 patients were using topical ear drops and 2 patients were not using any topical medications. Of the 98 patients, 78 were using non-ototoxic ear drops and 20 were using ototoxic ear drops. Among the 15 CSOM patients with only SNHL, 13 patients (86.7%) were using ototoxic ear drops and only 2 patients (13.3%) were using non-ototoxic ear drops (table-1) (Fig-1).

## DISCUSSION

Chronic suppurative otitis media (CSOM) is one of the most common conditions encountered by otologist in routine day to day practice. CSOM has been conventionally described in terms of loss in the conductive component of hearing. The present study was undertaken to evaluate the presence of a sensorineural element in hearing loss in CSOM patients associated with use of topical ear drops.

In the present 100 series csom patients study, 98 patients were using topical ear drops, of this 78 were using non-ototoxic ear drops and 20 were using ototoxic ear drops. Among the 15 CSOM patients with only SNHL, 13 patients (86.7%) were using ototoxic ear drops and only 2 patients (13.3%) were using non-ototoxic ear drops. This result is similar to the observation of Browning GG et al<sup>1</sup>, that there is little evidence to suggest any relation between use of topical antibiotics and development of measurable SNHL in humans. However this observation also supported by Fradis et al<sup>2</sup>, who opined that treatment with ear drops containing ototoxic agents may contribute in causing SNHL by diffusion through round window membrane. It was concluded that duration of ear drops and degree of sensori neural hearing loss was not

statistically significant. Similar results were obtained in the study by Linder, Thomas E et al<sup>5</sup>. He concluded only two patients developed sensori neural hearing loss among 134 cases he studied for 40 years!! Paparella et al.<sup>10</sup> also showed that chronic otorrhoea has deleterious consequences to inner ear.

Although widely used ototopical preparations rarely induced sensori neural hearing loss. The study conducted by Andrew P Bath et al<sup>6</sup>, ototoxicity developed in majority of patients who used eardrops for a duration longer than 20.7 days (average). This result could be due to the fact that they studied the effect of only Gentamycin and only in 16 cases. Winterstein AG, Liu W et al<sup>7</sup>, in their retrospective cohort study found short term use of neomycin ear drops in patients with non-intact tympanic membrane is not associated with increased risk of sensori neural hearing loss, however repeated doses showed significant association with increased risk of sensori neural hearing loss. Linder et al.<sup>5</sup> mentioned possible ototoxic side effects of ototopical preparation in continuous use beyond 2 weeks in patients with CSOM as a cause of SNHL in such patients. Also it should be noted that other confounding factors like age of patient, additive in topical medications like lignocaine, clotrimazole, preservative benzyllkonium, sex of patient, duration of ear discharge, size of perforation, duration of ear topical ear medication use and patient compliance play a significant role in development of SNHL in patient using topical ear drops. Various other studies have shown increasing age was a risk factor in the evolution of SNHL in patients with CSOM.<sup>9</sup> These confounding factors requires further evaluation and study.

## CONCLUSION

There was synergistic increase in incidence of SNHL in CSOM patients on increasing use of topical ototoxic ear drops. Our study was a small study and we recommend more study for better understanding.

## REFERENCES

1. Browning GG, Gathhouse S. Calder medical management of active chronic otitis media: A controlled study. *J laryngol Oto* 1988;102:491-495.
2. Fradis M, Ben-David J, Podoshi L, Basher B. Sensorineural hearing loss in chronic otitis media patients treated topically with ear drops. *New Dimension otolaryngol Head and Neck surg* 1985;2:11-12.
3. Sharma Karan, Gulati SK, Kaur Rupinder. Sensorineural hearing loss in chronic suppurative otitis media-safe type. *Indian J of Otolaryngol* 2005;11:22-26.
4. Kolo E.S, Salisu A.D, Yaro A.M, Nwaorgu O.G.B; Sensorineural hearing loss in patients with chronic suppurative otitis media. *Indian Journal of*

- Otolaryngology and Head and Neck Surgery, March 2012; 64: 59-62.
5. Linder T.E, Zwicky S, Brändle P; Ototoxicity of ear drops: A Clinical Perspective. *The American Journal of Otolaryngology and Neurology*, 1995; 16:653-657.
  6. Winterstein AG, Liu W, Xu D, Antonelli P.J; Sensorineural hearing loss associated with neomycin ear drops and non-intact tympanic membrane. *Otolaryngol Head Neck Surg*, 2013; 148:277-83.
  7. Grewal D.S, Hathiram B.T, Dwivedi A, Kumar L, Sheth K, Srivastava S; Labyrinthine fistula: A complication of chronic suppurative otitis media *Journal of Laryngology and Otology* 2003; 117:353-357.
  8. Portier F, Lescanne E; Studies of labyrinthine cholesteatoma – related fistula. *Journal of Otolaryngology*, 2005; 34:1-6
  9. Azevedo AF, Pinto DCG, Alves de Souza NJ, Greco DB, Goncalves DU. Sensorineural hearing loss in chronic suppurative otitis media with and without cholesteatoma. *Braz J Otorhinolaryngol*. 2007;73:671-4.
  10. Paparella MM, Morizono T, Le CT, Mancini F, Sipilä P, Choo YB, et al. Sensorineural hearing loss in otitis media. *Ann Otol Rhinol Laryngol* 1984;93:623-9.

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

**Submitted:** 03-03-2018; **Accepted:** 01-04-2018; **Published:** 10-04-2018