

Frequency of Sensorineural Hearing Loss in Chronic Otitis Media

SAYYED MUDDASIR SHAH¹, SAHIBZADA FAWAD KHAN², MUBASHAR ULLAH JAN³, HAIDER ZAMAN⁴

¹Assistant Professor, ²Assistant Professor, ³Senior Registrar, Department of ENT, Bacha Khan Medical College, Mardan Medical Complex Mardan

⁴Associate Professor, Department of ENT, Nowshera Medical College, Qazi Medical Complex Nowshera

Correspondence to: Sahibzada Fawad Khan, Email: drfawadkhanent@yahoo.com, Cell: 0334-8952520

ABSTRACT

Objective: To identify the frequency of sensorineural hearing loss in chronic otitis media.

Study Design: Cross-sectional study.

Place and Duration of Study: Department of ENT, Bacha Khan Medical College, Mardan Medical Complex Mardan from 1st October 2019 to 30th September 2021.

Methodology: One hundred patients with chronic suppurative otitis media clinical symptoms and diagnosis were included in the study. The age of the patients was between 11-50 years. A mean of 0.05 an average result of three recorded frequencies on an audiogram was calculated. With an increase in chronic suppurative otitis media duration the number of sensorineural hearing loss patients was determined.

Results: The mean age was 36.3±6.6 years with 54% males and 46% females. The frequency of sensorineural hearing loss was reported as 51 (51%) of the otitis media disease patients were suffering from sensorineural hearing loss condition while the similar condition was not seen in the 49% of the chronic suppurative otitis media patients.

Conclusion: A high frequency of sensorineural hearing loss was recorded in the chronic suppurative otitis media patients.

Keywords: Sensorineural, Otitis media, Hearing loss

INTRODUCTION

Chronic infections of ear have been affecting a great number of people worldwide. This chronic ear infection includes various disease conditions such as chronic-mastoiditis, otitis media, tympanosclerosis as well as, cholesterol-granuloma. Chronic suppurative otitis media (CSOM) is condition affecting the middle ear. It lasts more than six to twelve weeks via perforated tympanic-membrane.¹⁻³ This infection is extremely prevalent all over the globe with various etiological characteristics resulting in loss of hearing not in young children but also prevalent in adults.⁴ Chronic suppurative otitis media prevalence in developing countries is around seven percent as documented by the World Health Organization. Higher population rate and poor life standards are considered as a main reason of such high prevalence.^{5,6}

Hearing loss as a consequence of chronic otitis media is conductive which is caused by TM rupturing or as a result of ossicular-chain alterations which is affected by inflammation. There are two various types of CSOM identified as atticofurcal and tubotympanic.⁷ The former is related with foul smelling scanty discharge, granulations in addition to cholesteatoma while the later contains profuse discharge from the ear without cholesteatoma. Conservative treatment plan is much more reliable for managing the conditions however, hearing extent of hearing loss associated with this is questionable.^{8,9}

Sensorineural hearing loss (SNHL) has been reported to be related with recurrent infections by ear drum perforations which absorb toxic compounds in the cochlea.¹⁰ The present study was planned to assess the frequency of sensorineural hearing loss in chronic otitis media. The requirement of this work was based on providing realistic statistics of its frequency for better control and management of the condition.

MATERIALS AND METHODS

This cross-sectional study was carried out at Department of ENT, Bacha Khan Medical College, Mardan Medical Complex Mardan from 1st October 2019 to 30th September 2021. A total of 100 patients with CSOM clinical symptoms and diagnosis were included while those patients having familial SNHL history or ototoxic-drug history were excluded. The enrolled patients were having no operative history and were having either unilateral or tubo-tympanic disease form. The age of the patients was between 11-50 years. The study was permitted through ethical clearance department. Each patient enrolled as study participant was also asked for a verbal consent where the complete study research details were shared with each patient for their understanding and satisfaction. Audiogram was used to assess the auditory abilities of each patient. With a mean of 0.05 an average result of three

recorded frequencies on an audiogram was calculated. With an increase in CSOM duration the number of SNHL patients was determined. Demographic, gender related as well as frequency of SNHL was documented in the well-structured questionnaire. Data was analyzed by SPSS version 26.

RESULTS

The mean age of the patients was 36.3±6.6 years with 54% males and 46% females (Table 1). The frequency of SNHL was reported as 51 (51%) of the otitis media disease patients were suffering from SNHL condition while the similar condition was not seen in the 49% of the CSOM patients (Fig. 1).

Table 1: Demographic information of the patients (n=100)

Variable	No.	%
Age (years)	36.3±6.6	
Gender		
Male	54	54.0
Female	46	46.0

Table 2: Comparison of patients with SNHL

Variable	No.	SNHL	
		Presented	Not Presented
Duration (months)			
< 12	60	29 (48.4%)	31 (51.6%)
12-24	40	22 (55%)	18 (45%)
Age (years)			
11-21	30	12 (40%)	18 (60%)
31-50	70	39 (55.7%)	31 (44.2%)

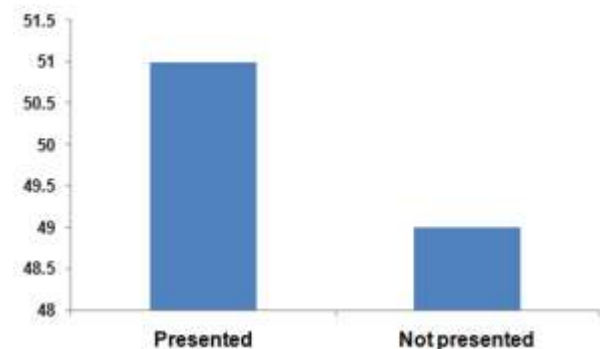


Fig 1: Frequency of SNHL in otitis media patients

The patient's enrolment continued from less than twelve months until 24 months of the time. Within the total number of

patients within these two years it was observed that patients with otitis media complain were registered high in less than 12-month duration while less number of patients reported in 12-24 months of time. The frequency of SNHL in less than 12 months was observed in 29 such as 48.3% cases while this frequency was increased up to 55% in patients with complain longer than 12 months. There was an increasing trend of SNHL with age (Table 2).

DISCUSSION

Although the range of complications occurring in CSOM are varied but lethal morbidities relating to loss of hearing are most frequently reported and critical. There has been controversial literature regarding the association of CSOM with SNHL but majority of the literature available in this context confirms that CSOM has a positive association with SNHL.¹¹⁻¹³ Similar results were also seen in the present study. The current research has reported a high number of patients positive with SNHL in CSOM disease. Other studies in the similar context have reported similar data finding with a frequency of SNHL in otitis media patients as 43%, or 24% or 12%. The results of these studies are greatly dependent on the regional disparities and also on the socioeconomic status of the region under description.¹⁴⁻¹⁶

The SNHL was observed in cases with 47% within the first year of CSOM, In the current research it was found to be 48.3% frequent in cases with the first year of complain.^{15,16} The frequency is reported to be increase by 52% within years one to five. Similar and exact result were interpreted on current research with 52% SNHL cases presented in second year of the complain.

The research elsewhere also reports that this frequency surges up to hundred percent with a duration of CSOM complain greater than five year. However, the comparison of this was not available in the present study due to limitation of time where such a long duration study was not feasible. Although the trend analysis was showing the similar findings as reported in earlier researches.¹⁷⁻²⁰ The increase in age has also been described as directly related with complication of SNHL formation with a risk ratio upto 0.61 in comparison to 0.13 db per year in SNHL against normal cases. The otogenic surgical procedure as tympanoplasty has been reported to have a great success rate and delay in this procedure can accelerate the morbidity risk of SNHL.²⁰

CONCLUSION

A high frequency of sensorineural hearing loss was recorded in the chronic suppurative otitis media patients. The frequency of SNHL was also related with the age as well as duration of CSOM of the patients.

REFERENCES

1. Matsuda Y, Kurita T, Ueda Y, Ito S, Nakashima T. Effect of tympanic membrane perforation on middle-ear sound transmission. *J Laryngol Otol* 2009; 123: 81-9.

2. Chronic Suppurative Otitis media: burden of illness and management options. Child and Adolescent Health and Development, Prevention of Blindness and Deafness. World Health Organization. Geneva, Switzerland: 2004; 14-9.
3. Schachern P, Tsuprun V, Cureoglu S, Ferrieri P, Briles D, Paparella M, et al. The Round Window Membrane in Otitis Media. *Arch Otolaryngol Head Neck Surg* 2008; 134: 658-62.
4. Yoshida H, Miyamoto I, Takahashi H. Is sensorineural hearing loss with chronic otitis media due to infection or aging in older patients? *Auris Nasus Larynx* 2009; 36: 269-73.
5. Paparella MM, Morizono T, Le CT, Mancini F, Sipila P, Choo YB, et al. Sensorineural hearing loss in otitis media. *Ann Otol* 1984; 93: 623-9.
6. Kaur K, Sonkhya N, Bapna AS. Chronic suppurative otitis media and sensorineural hearing loss: is there a correlation?. *Ind J Otolaryngol Head Neck Surg* 2003; 55: 21-4.
7. Levine BA, Clough S. Sensorineural hearing loss in chronic otitis media, Is it clinically significant? *Arch Otolaryngol Head Neck Surg* 1989; 115: 814-6.
8. Sakagami M, Maeda A, Node M, Sone M, Makino Y. Long-term observation on hearing change in patients with chronic otitis media. *Auris Nasus Larynx* 2000; 27: 117-20.
9. Kolo ES. Sensorineural hearing loss in patients with CSOM. *Indian J Otolaryngol Head Neck Surg* 2012; 64: 59-62.
10. Yehudai N, Most T, Luntz M. Risk factors for sensorineural hearing loss in pediatric chronic otitis media. *Int J Pediatr Otorhinolaryngol* 2015; 79: 26-30.
11. Aarhus L, Homøe P, Engdahl B. Otitis media in childhood and disease in adulthood: a 40-year follow-up study. *Ear Hear* 2020;41:671.
12. Thakur CK, Gupta A, Kumar A. Does mucosal chronic otitis media leads to sensorineural hearing loss. *Indian J Otolaryngol Head Neck Surg* 2019;205:1-3.
13. Kaur K, Sonkhya N, Bapna AS. Chronic suppurative otitis media and sensorineural hearing loss: is there a correlation? *Indian J Otolaryngol Head Neck Surg* 2003;55:21-4.
14. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med* 2009;6:e1000097.
15. Ouzzani M, Hammady H, Fedorowicz Z, Elmagarmid A. Rayyan - a web and mobile APP for systematic reviews. *Syst Rev* 2016;5:1-10.
16. Katz J. *Handbook of Clinical Audiology*. 5th ed. Baltimore: Williams & Wilkins, 2002.
17. Deeks J, Dinnes J, D'Amico R. Evaluating non-randomized intervention studies. *Heal Technol Assess* 2003;7.
18. Hayden JA, van der Windt DA, Cartwright JL, Cote P, Bombardier C. Assessing bias in studies of prognostic factors. *Ann Intern Med* 2013;158(4):280-6.
19. Amali A, Hosseinzadeh N, Samadi S, Nasiri S, Zebardast J. Sensorineural hearing loss in patients with chronic suppurative otitis media: is there a significant correlation? *Electron Physician* 2017;9(2):38237.
20. de Azevedo AF, Pinto DCG, de Souza NJA, Bartolomeu D, Goncalves U. Sensorineural hearing loss in chronic suppurative otitis media with and without cholesteatoma. *Braz J Otorhinolaryngol* 2007;73(5):671-4.