October 2016

Frequency of sensorineural hearing loss in chronic suppurative otitis media

Syed Sajjad Ali Zaidi
Aga Khan University

Hamdan Ahmed Pasha,
Aga Khan University, hamdan.pasha@aku.edu

Anwar Suhail,
Aga Khan University, anwar.suhail@aku.edu

Talha Ahmed Qureshi
Aga Khan University

ENT, HEAD AND NECK SURGERY

SHORT REPORT

Frequency of Sensorineural hearing loss in chronic suppurative otitis media

Syed Sajjad Ali Zaidi, Hamdan Ahmed Pasha, Anwar Suhail, Talha Ahmed Qureshi

Abstract

Chronic suppurative otitis media (CSOM) is defined as chronic otorrhea (i.e., lasting > 6-12 weeks) through a perforated tympanic membrane. It is generally associated with some degree of conductive hearing loss. However, recurrent ear infections due to perforated eardrum result in absorption of toxins and macromolecules into the cochlea leading to sensorineural hearing loss (SNHL). We planned to determine the frequency of sensorineural hearing loss in chronic suppurative otitis media. A descriptive cross-sectional study was conducted at Aga Kgan University Hospital, Karachi, from October 2013 to March 2014. Average threshold of speech frequencies was calculated via pure tone audiogram for both diseased and normal contralateral ear. A mean of >25db in diseased ear was labelled as positive case for SNHL. SNHL was reported in 64(52%) patients and the frequency was found to increase with increasing duration. Patients with CSOM should be counselled regarding the risk of developing SNHL if left untreated.

Keywords: Sensorineural hearing loss, SNHL, Chronic suppurative otitis media, CSOM, Tympanic membrane, Recurrent otitis media, Deafness.

Introduction

The chronic ear disease includes a number of various entities, like chronic otitis media, chronic suppurative otitis media (COSM), chronic mastoiditis, tympanosclerosis, cholesterol granuloma etc. CSOM, a chronic infection of the middle ear, defined as chronic otorrhea (i.e., lasting >6-12 wk) through a perforated tympanic membrane (TM),[1] is highly prevalent worldwide and is the major aetiological factor responsible for hearing loss among children and young adults. According to the World Health Organisation (WHO), there is a prevalence of as high as 7% in the developing world[2] and this is thought to be a result of overcrowding and poor socioeconomic status.

Chronic otitis media is generally associated with some degree of hearing loss, which is often the patient's chief complaint. This hearing loss is usually conductive, resulting from TM rupture and/or changes in the ossicular chain due to fixation or erosion caused by the chronic inflammatory process.

Traditionally, CSOM is divided into atticoantral and tubotympanic types. In atticoantral disease there is scanty discharge with foul smell, perforation of TM usually involves the margins of TM and the disease is associated with cholesteatoma, granulations and other complications. In tubotympanic disease, there is profuse recurrent ear discharge with central TM perforation. This type is not associated with cholesteatoma and other complications — considering this a safe disease there is a general trend among treating physicians and patients to delay surgical repair and only conservative medical treatment is given for recurrent episodes of infections, even for years.

However, the safety of this disease is questionable in terms of hearing stability. Chronic inflammatory processes in the middle ear affect the inner ear hearing mechanism. Recurrent ear infections due to perforated ear drum result in absorption of toxins and macromolecules into the cochlea through the thin round window membrane leading to sensorineural hearing loss (SNHL).[3] Several studies regarding SNHL in CSOM showed differing results. Some of them showed no significant SNHL whereas others concluded with recommendations for early treatment due to significant SNHL loss.[4]

The current study was planned to determine the frequency of SNHL in CSOM patients.

Methods and Results

The descriptive, cross-sectional study was conducted at the Department of Otorhinolaryngology, Aga Kgan

Department of Otolaryngology, Head and Neck Surgery, Aga Khan University Hospital, Karachi, Pakistan.

Correspondence: Hamdan Ahmed Pasha. Email: hamdan.pasha@aku.edu

Table-1: Frequency of hearing loss.

SNHL	Frequency	Per cent (%)
Yes	63	52
No	58	48

Table-2: Relationship between duration of disease and sensorineural hearing loss (SNHL).

Duration in Months	No. of Patients	SNHL	
		Yes	No
< 12	60	47%	53%
12 - 59	50	52%	48%
> 60	11	63%	37%

University Hospital (AKUH), Karachi, from October 2013 to March 2014. All patients diagnosed with CSOM aged 6-45 years having previously non-operated ear or having unilateral and tubotympanic type of disease were included. Those with a family history of SNHL, history of ototoxic drugs usage and trauma to the ear were excluded. Also excluded were those with missing data or with audiogram done outside our institution. Patient confidentiality was maintained throughout the study and no harm was reported by any patient during the study.

To control bias, the audiologist was blinded to the diagnosis at the time of performing the audiogram. The average of three speech frequencies was calculated on audiogram and mean <25 decibels, was taken as SNHL positive. The prevalence of SNHL was calculated as frequencies and percentages and the trend of affected patients was compared with the duration of the CSOM. All data was analysed using SPSS 19. SNHL definition was kept as follows.

Of the 121 patients, there were 67(57%) males (57%) and 52(43%) females. The overall mean age was 28±6.3 years (range: 6-45 years).

Sensorineural hearing loss was found in 64(52%) patients (Table-1). Both ears were equally involved and the duration ranged from a minimum of 2 months to almost 8 years with a mean of 18.93±5.8 months. Though statistically non-significant (p>0.05), there was an increasing percentage of patients affected with SNHL as the duration of CSOM increased (Table-2).

Conclusion

Despite various complications attached with the CSOM which can be very morbid, the very disturbing complication remains the hearing impairment.

Although various studies show the association between the CSOM and SNHL, yet the topic has been controversial. The study was conducted to find the answer for our population regarding this association. In our study great number of patients had SNHL in the diseased ear suffering from CSOM and was found to be reaching up to 52%. In various studies conducted regarding SNHL in CSOM, Paparella[5] found 43%, Kaur[6] had 24% and Levine[7] reported 12% patients developing SNHL.

The frequency of SNHL was found to be 47%, 52% and 100% for less than 1 year, 1 to 5 years and more than 5 years respectively. Sakagami et al[8] also showed that duration does matter. They calculated that age of patient has an impact on ear for SNHL but for the ear with CSOM, SNHL had rapid development at 0.61 dB/year compared to normal ear which developed SNHL at 0.13dB/year. On the contrary, E.S. Kolo[9] concluded that there was no correlation between SNHL and the duration of disease.

A recent study found that CSOM also resulted in clinically significant SNHL, and suggested early surgical treatment of TM perforations.[10]

Tympanoplasty is a simple and common otologic surgery, with good anatomic and functional success rate. Our study points out the fact that patients who delay surgical treatment of TM perforations are at a higher risk of developing SNHL as time passes. This is especially applicable in our population where CSOM is prevalent and access to surgical treatment is difficult.

Our study has limitations in terms of small sample size. Also, many patients could have used different local remedies like oil/herbal products for the relief of symptoms and these could have been potential confounders.

Declaration on competing interests: None to declare.

Disclaimer: None.

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.