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FREQUENCY OF OTORRHEA IN CHRONIC SUPPURATIVE OTITIS MEDIA AND SENSORINEURAL HEARING LOSS: ARE THEY RELATED?

Otorhinolaryngology

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ABSTRACT

Hearing loss and otorrhea are common presenting complaints of CSOM.

Otorrhea is a source of great discomfort to the patient. This otorrhea is episodic and presents during the active stage of the disease and disappears once the infection subsides. Many studies have reported presence of SNHL in patients with CSOM. We undertook this study to find out whether CSOM can cause significant SNHL and whether the frequency of otorrhea is related to the degree of SNHL. A total of 48 patients were evaluated. The frequency of otorrhea in these patients was noted. Bone conduction threshold for both ears at 500, 1000, 2000 and 4000 Hz were recorded. We found a statistically significant correlation between frequency of otorrhea and sensorineural hearing loss with Pearson correlation value of 0.663. It is observed that there is a statistically significant difference in bone conduction thresholds between diseased ear and normal ear in all the tested frequencies.

KEYWORDS

Chronic suppurative otitis media, sensorineural hearing loss, otorrhea

INTRODUCTION

Chronic suppurative otitis media (CSOM) is a long standing infection of a part or whole of the middle ear cleft characterized by ear discharge and a permanent perforation.[1]

CSOM commonly presents as acute otitis media. The persistent perforation in tympanic membrane leads to a chronically discharging ear. The problem is more profound in developing countries. Tubotympanic or mucosal variety of CSOM is fairly common in rural population.[2]

Hearing loss and otorrhea are common presenting complaints of CSOM.

Hearing loss is one of the common feature of CSOM and most often the presenting feature in our society. Otorrhea is a source of great discomfort to the patient. This otorrhea tends to be episodic and presents during the active stage of the disease and disappears once the infection subsides. Hearing loss in CSOM is mostly conductive due to tympanic membrane perforation[2]. Many of these cases have some degree of sensorineural hearing loss (SNHL). Many studies have reported presence of SNHL in patients with CSOM.[4,5,6] The prevalence and etiology of this SNHL remains controversial. It is generally agreed that bacterial toxins are the causative factor of this neural type of deafness, and also the fact that round window membrane is the pathway which transmits toxins from middle ear to inner ear[7]. We undertook this study to find out whether CSOM can cause significant SNHL and whether the frequency of otorrhea is related to the degree of SNHL

MATERIALS AND METHODS

This prospective study was conducted at Deparment of Otorhinolaryngology and Head & Neck Surgery, Adichunchanagiri Institute of Medical Sciences, B G Nagara. The study period was from January 2017 to June 2018.

We have followed very rigid criteria for this study in order to avoid compounding due to other causes of SNHL. We have chosen a very young study group (20 to 35 years) to prevent interference of age related hearing loss. In addition to this we have selected patients with long standing disease (> 10 years)

Inclusion criteria

1. Patients with unilateral CSOM.
2. Patients in the age group 20-35 years.
3. Patients with long standing disease for a period more than or equal to 10 years.

Exclusion criteria

1. Patients with family history of hearing loss.
2. Patients with history of head injury.
3. Patients with history of exposure to loud noise.
4. Patients not consenting to participate in the study.

Patients presenting to ENT OPD with unilateral CSOM for atleast 10 years duration were chosen for the study after obtaining patient consent. The patients were subjected to detailed history taking and ENT examination including examination under microscope. The frequency of otorrhea was recorded as number episodes per year. All active cases of CSOM were treated appropriately to make the ear dry. All patients underwent a pure tone audiometry and findings were duly recorded. Elkon Eda 3N3 Multi audiometer was used for all patient. Audiometry room conformed to American National Standards Institute specifications. In our study the normal ear served as control. The bone conduction threshold for 500Hz, 1000Hz, 2000Hz and 4000Hz were obtained and studied for presence of SNHL. The difference in bone conduction threshold between diseased and normal ear was considered as SNHL attributable to CSOM.[8] Data was entered in MS excel 2016 and analysed using SPSS 20.0. Data was expressed in mean and proportion. Student t test was used for comparison of group means. Pearson coefficient of correlation was calculated to determine the correlation between number of episodes of otorrhea and SNHL. P value less than 0.05 was considered significant.

RESULTS

Among the 48 patients, 17 were in the age group of 21-25 years and an equal number were in the age group 26-30 years, whereas 14 patients were in the age group of 31-35 years. The mean age was 27.5 with SD of 4.016.

Table 1: Age distribution

Age	Number of patients	Percent
21-25 years	17	35.4
26-30 years	17	35.4
31-35 years	14	29.2
Total	48	100.0

In the study population, 20 were females and 28 were males i.e. 41.7% and 58.3% respectively.

Table 2: Sex distribution

Sex	Number of patients	Percent
Female	20	41.7
Male	28	58.3
Total	48	100.0

54.2 % (n=26) of the patients had 1 to 3 episodes of otorrhea per year.

And only 10.4 %(n=5) had more than 6 episodes per year.

Table 3 : Frequency of otorrhea

Frequency of otorrhea in number of episodes per year	Number of patients	Percent
1 to 3	26	54.2
4 to 6	17	35.4
>6	5	10.4
Total	48	100.0

In our study a total of 48 patients were included. We found a statistically significant correlation between frequency of otorrhea and sensorineural hearing loss with Pearson correlation value of .663

Table 4: Statistical correlation between frequency of hearing loss and SNHL

		SNHL
Frequency of otorrhea in number of episodes per year	N	48
	P value	<0.01
	Pearson Correlation	.663**

It is observed that there is a statistically significant difference in bone conduction thresholds between diseased ear and normal ear in all the tested frequencies i.e. 500, 1000, 2000 and 4000 Hz. The mean difference in bone conduction threshold at 500 Hz, 1000Hz, 2000Hz and 4000Hz was found to be 11.354 dB, 10.833dB, 12.396 dB and 11.458dB respectively.

Table 5 : Comparison of audiometry results in diseased & normal ear

				t	P value	Mean Difference	95% Confidence Interval of the Difference	
Group		Mean	Std. Deviation				Lower	Upper
500Hz	Normal ear	7.29	6.438	6.192	<0.01	11.354	7.714	14.995
	Diseased Ear	18.65	10.952					
1000Hz	Normal ear	8.65	6.821	5.070	<0.01	10.833	6.591	15.076
	Diseased Ear	19.48	13.138					
2000Hz	Normal ear	9.06	8.421	5.148	<0.01	12.396	7.615	17.177
	Diseased Ear	21.46	14.401					
4000Hz	Normal ear	10.73	8.567	4.685	<0.01	11.458	6.602	16.314
	Diseased Ear	22.19	14.620					
Mean	Normal ear	8.9323	7.05219	5.408	<0.01	11.51042	7.28435	15.73648
	Diseased Ear	20.4427	12.95063					

DISCUSSION

In our study we observed a statistically significant difference in bone conduction thresholds of diseased ear and normal ear. This observation signifies that the SNHL component in a case of CSOM is more common than presumed.

We found no significant age or sex preponderance. More importantly we found a very significant association between frequency of otorrhea and the degree of SNHL. It is the repeated active infections of the middle ear which may be causing the significant SNHL. Prompt treatment of active CSOM may help counter development of SNHL. Paperella reported a high prevalence of SNHL in CSOM. He further suggested that round window membrane acts as a pathway for bacterial toxins and other inflammatory mediators to reach inner ear.

Malashetti S et al conducted a study at S. Nijalingappa Medical College and HSK Hospital, Navanagar, Bagalkot, Karnataka, India. They found that out of total 105 cases of CSOM 30 (28.57%) had sensorinueral hearing loss. Among the affected 13 were males and 17 were females with males to females ratio of 1:1.3.Mean bone conduction thresholds in males at 1 kh, 2 kh and 4 kh is 30.38%, 38.46% and 46.15% respectively and Mean bone conduction thresholds in females at 1 kh, 2 kh and 4 kh is 30.88%, 35% and 44.41% respectively.[9]

Deviana et al carried out a observational descriptive study in 186 CSOM patients who came to ENT-Neurotology Outpatient Department of Dr. Saiful Anwar Hospital Malang within a period of 3 years. The major pattern of hearing loss was conductive hearing loss (59%). Sensorineural hearing loss was present in about 8% cases. 5% of cases had normal hearing. [10]

Alexandre Fernandes de Azevedo et al evaluated 115 patients with CSOM in the year 2007 and they observed that SNHL occurred in 13% of the patients with CSOM, and was correlated with older age, but not with the presence of cholesteatoma or longer duration of ear disease. The average age was 26.3 years, 58 males and 57 females. The duration of ear disease was, in average, 12.4 years. The average threshold of hearing was 40 dB in CSOM ear and 22 dB in the normal contralateral ear (P=0.002). In the abnormal ear, SNHL was seen in 15 cases, being 6 cases of profound loss, that correlated with adjusted-age (P=0.003) and absence of cholesteatoma (P=0.01), but not with disease duration (P=0.458).[11]

Early intervention in the form of either medical or surgical treatment in chronic suppurative otitis media will help in reducing the incidence of SNHL in these patients. An ENT surgeon should give due consideration to presence of SNHL because unlike the conductive hearing loss, the SNHL is irreversible.

CONCLUSION

We conclude that there is a statistically significant sensorineural hearing loss in patients with chronic suppurative otitis media. This sensorineural hearing loss correlates well with the frequency of otorrhea. Recognising this correlation and initiating early treatment is the key to effectively controlling development of sensorineural hearing loss. Early surgical intervention in the form of tympanoplasty will reduce the incidence of irreversible sensorineural hearing loss.

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