

Demographical Variations of Sensory Neural Hearing Loss (SNHL) in Chronic Suppurative Otitis Media (CSOM) patients at JPMC Karachi

ZUBAIR ANWAR¹, SAAD ABDUR REHMAN AFAQUE², MUHAMMAD IMRAN BHATTI³, MUHAMMAD RAZZAQ DOGAR⁴, MARIA MAHMOOD⁵, ADNAN ANWAR⁶

¹MBBS, DLO, MCPS, FCPS, FEBORL-HNS, Assistant Professor, ENT, Head & Neck Surgery Department, Jinnah Post Graduate Medical Centre Karachi.

²MBBS.FCPS, Senior Registrar in Department of ENT, Jinnah Postgraduate Graduate Medical and Dental College.

³MBBS.FCPS, Senior Registrar Department of ENT, Head & Neck Surgery of Liaquat university of Medical and Health Science Jamshoro.

⁴MBBS, DLO, FCPS, Head of Department, ENT, Head & Neck Surgery Department, Jinnah Post Graduate Medical Centre Karachi.

⁵MBBS, FCPS, Assistant Professor, Department of ENT Head & Neck Surgery, Baqai Medical University.

⁶MBBS, M.Phil., Associate Professor, Department of physiology.

Corresponding author: Muhammad Razzaq Dogar, Email: dogarent1@gmail.com

ABSTRACT

Objectives: CSOM is significantly associated with SNHL but with mixed demographical associations being reported in literature. To determine the demographical variations (age and gender) of SNHL among CSOM patients

Study design and setting: Cross-sectional observational study at Jinnah Postgraduate Medical Center, Karachi, Pakistan.

Methodology: Using non-probability convenient sampling, diagnosed CSOM patients within six months between 10-50 years of either gender were included while patients with history of SNHL previously using ototoxic drugs, ear trauma or refusing to consent were excluded. SPSS v23.0 was used for analysis of data and chi-square was applied keeping p-value <0.05 as statistically significant.

Results: From total 200 patients, 60 (30%) patients were between 10-18 years, 120 (60%) between 19-35 years and 35-50 years were 20 (10%) patients. 145 (72.5%) were females while 55 (27.5%) males. SNHL was observed in 36 (18%) of patients. Between 10-18 years age group, 10 (16.7%) patients were reported with SNHL, between 19-35 years age group 22 (18.3%) while between 35-50 years, 4 (20%) of patients were found to have SNHL with an insignificant p-value of 0.934. 28 (19.3%) males were reported to have SNHL while 8 (14.5%) females were observed to have SNHL with CSOM. An insignificant p-value of p=0.434 was reported between the genders.

Conclusion: According to the results of this study, SNHL was insignificantly associated with CSOM according to demographics (age and gender). Further studies are required to validate the findings of this study.

Keywords: Chronic Suppurative Otitis Media, Sensori Neural Hearing Loss, Otitis Media

INTRODUCTION

Chronic diseases of the ear encircle a wide range of entities, such as chronic otitis media, chronic mastoiditis, chronic suppurative otitis media (CSOM), cholesterol granuloma, tympanosclerosis to name a few (1, 2). Among them, CSOM is a very commonly reported ear infection of the middle ear, described as a chronic otorrhea, lasting about 6 to 12 weeks or more through perforation in the tympanic membrane (TM) (3). The prevalence of this condition is very high, being the main etiological factor that causes hearing loss amongst both children and adults (4). World Health Organization (WHO) reports prevalence of CSOM at around 7 % in developing world, majorly contributed by poor socio-economic status and over-crowding (5).

In general, chronic otitis media is linked with some degrees of hearing loss, which is seldom the chief complaint of patients with CSOM (6). The type of loss of hearing is, in many cases, conductive which results from rupture of tympanic membrane and/or alterations in the ossicular chain because of erosion or fixation due to the process of chronic inflammation (7).

Chronic Suppurative Otitis Media (CSOM) is common observed among all age groups throughout the world, especially in the developing countries (8). Almost equal distribution of male and females is also reported; however, inclination is more towards the latter (9). CSOM is divided into two types, mucosal and epithelial. The latter is often linked to Cholesteatoma and because of this the treatment tends to be conservative as it is considered a safe disease, resulting in both delay in surgical repair as well as presenting with much severe disease in older age (10). Therefore, the common practice for CSOM that is usually observed is treatment with antibiotics at time of active infection (11). Recurrent infections of the middle ear can also affect the inner ear's mechanism of hearing which can lead to sensorineural hearing loss (SNHL) (12). Studies have reported variations in both age and gender distribution of patients with CSOM having SNHL (13). Similarly, the etiological factors, risk factors, treatment options tend to vary in terms of age and severity of disease (14).

The objective of this study is to determine the demographical variations (in terms of age and gender) of sensorineural hearing

loss (SNHL) among Chronic suppurative otitis media CSOM patients at Jinnah Postgraduate Medical Center, Karachi.

METHODOLOGY

Using non-probability convenient sampling, a cross-sectional observational study was done at Jinnah Postgraduate Medical Center's (JPMC) Department of Ear, Nose and Throat (ENT) for a period of six months after approval from the Ethical Review Committee of JPMC. The inclusion criterion consisted of patients between 10-50 years of age, of either gender that were diagnosed as a case of CSOM within the last six months of presentation to the ENT clinic. Patients with previously known SNHL, history of use of ototoxic drugs, ear trauma and patients refusing to participate in the study were excluded from the research. For calculation of sample size, 7 % margin of error was kept with expected frequency of SNHL in CSOM at 52 % and with a confidence level of 95 %, the sample size calculated was 200.

Data Collection Procedure: After ethical approval was attained from the Ethical Review Committee of JPMC, commencement of data collection was done. Patients were selected for the study according to the sampling technique and inclusion / exclusion criteria. Patients were informed about the study before taking informed consent. Diagnosed patients of CSOM agreeing to participate in the study were recorded for their demographics and any findings reported by the audiologist. The audiologist was blinded at time of diagnosis and performance of audiogram. Mean three frequencies of speech were recorded using audiogram, mean at <30 dB, was considered as positive SNHL. The principal investigator carried out all the procedures under the supervision of the supervisor, having minimum experience of five years. All demographics and final outcome i.e. SNHL was recorded on each patient's proforma.

Data Analysis: For entry of data and its analysis, SPSS v23.0 was used. The quantitative variables such as gender, age groups and for reporting SNHL, frequency and percentages were reported. For qualitative variables such as age, disease duration etc. mean and standard deviation was reported. Data was stratified according to

demographics, viz. age groups and gender with chi-square test applied keeping $p < 0.05$ as statistically significant.

RESULTS

From 200 patients included in the study, the mean age of patients was 24.7 ± 8.42 years. The mean duration of disease was 6.56 ± 4.28 years. Grouping of age was done as 10-18 years in one group, 19-35 years of age in second group and between 35-50 years in third group. 60 (30 %) were reported to be between 10-18 years of age, 120 (60 %) between 19-35 years and 20 (10 %) between 35-50 years [Figure I].

Amongst the 200 patients, 145 (72.5 %) were females while 55 (27.5 %) were males. The frequency of SNHL was reported in 36 (18 %) of patients [Figure II].

In terms of duration of CSOM with SNHL, in patients having CSOM between 2-6 years, 11 (10.9 %) were reported to have SNHL while in patients with >6 years of CSOM, 25 (25.3 %) were found to have SNHL, with a significant difference of $p < 0.008$ [Figure III].

In terms of association of age with SNHL, 10 (16.7 %) of patients between 10-18 years of age were found to have SNHL, while 22 (18.3 %) of patients between 19-35 years and 4 (20 %) between 35-50 years of age were reported to have SNHL with an insignificant difference of $p < 0.934$. Regarding association of SNHL with gender, 28 (19.3 %) and 8 (14.5 %) females were recorded to have SNHL, with an insignificant difference of $p < 0.434$ [Table I].

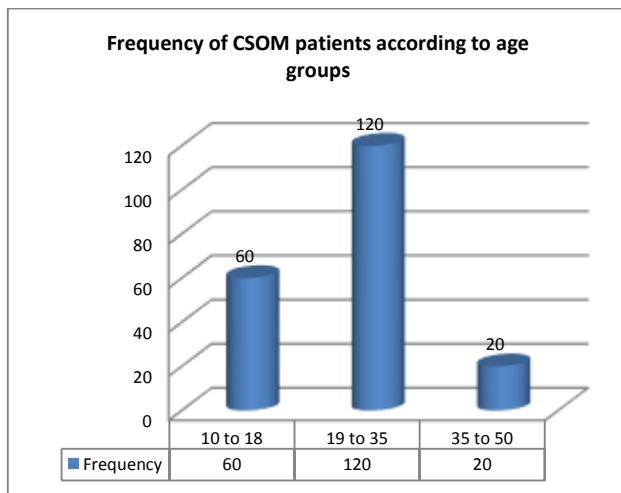


Figure 1: Graphical representation of patients included in the study according to gender (n=200)

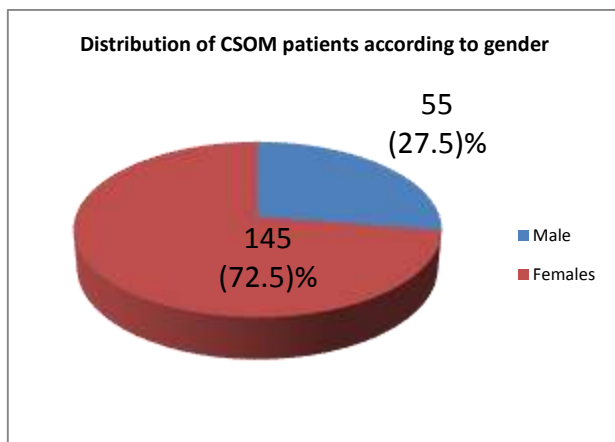


Figure 2: Graphical representation of distribution of patients according to gender (n=200)

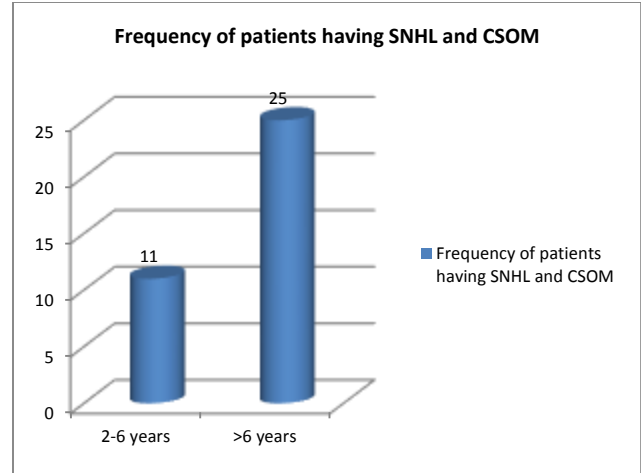


Figure 3: Graphical representation of CSOM patients with SNHL ($p < 0.008$) (n=200)

Table 1: Stratification of CSOM patients with SNHL in terms of age, gender and duration of disease (n=200)

Variables	SNHL		p-value	
	Yes	No		
Age Groups	10-18 years	10 (16.7 %)	50 (83.4 %)	0.934
	19-35 years	22 (18.3 %)	98 (81.7 %)	
	35-50 years	4 (20 %)	16 (80 %)	
Gender Groups	Male	28 (19.3 %)	117 (80.7 %)	0.434
	Female	08 (14.5 %)	47 (85.5 %)	
Duration of Disease	2-6 years	11 (10.9 %)	90 (89.1 %)	0.008
	>6 years	25 (25.3 %)	74 (74.7 %)	

DISCUSSION

The results of this study showed that from 200 included majorities were females and the most common age group was between 19-35 years of age. This could possibly be due to delayed attention to ear disorders among developing countries such as Pakistan, owing to majority of the population residing in poor socio-economic conditions, illiteracy and poverty. Moreover, lack of awareness, knowledge the ignoring ear diseases is a common practice amongst locals. Severity of CSOM lies in the fact that if treatment is delayed, it can lead to alterations in middle ear leading to changes in inner ear as well, leading to hearing loss and severe complications (15).

In our study, demographical variations existed both in terms of age and gender, however with insignificant differences between them when statistical tests were applied. Similarly in other studies as well such as by Ahmed MS et al, for evaluating association of CSOM with SNHL and also assessing impact of disease duration on hearing reported that from 150 patients included in the study, 72 were males and 83 females with mean age of 27 years. SNHL was reported in 30 % of patients (16). Likewise in our study as well, higher frequency of females was reported with overall mean age of 25 years and 18 % of patients reported to have SNHL. In another study of CSOM patients having SNHL, reported mean age was 35.48 ± 7.24 years, with 30 % females and 70 % males. Cultural, regional and socio-economic difference might owe to the variations in demographics being reported in our study and other studies (17, 18).

In yet another research by Ali Zaidi SS, from 121 CSOM patients included 67 (57 %) were males and 52 (43 %) females with overall mean age of 28 ± 6.3 years. SNHL was observed in 64 (52 %) of the patients included in the study (19). In line with our study, Awad OG et al reported that from 200 patients with CSOM, 88 were males with 112 females and overall mean age of 29.26 ± 14.57 years. Highest frequency of SNHL among CSOM patients was observed in between the 21-40 year age group, similar to the findings of our study as well (20).

This study was not free from limitations such as observer and selection bias in addition to this study being a single centered study with limited sample size. Furthermore the study only reported the demographical variations. Further multi-centered studies with greater sample size would authenticate the findings reported in this study.

CONCLUSION

According to the results of this study, SNHL was insignificantly associated with CSOM according to demographics (age and gender). Further studies are required to validate the findings of this study.

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