ORIGINAL ARTICLE

Pattern of Sensorineural Hearing Loss In Patients Attending ENT OPD

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Abstract

A total of 43003 patients visited ENT OPD and out of them 820 patients were diagnosed with pure sensorineural hearing loss (SNHL) with a incidence of 19.06 per thousand population and sex ratio of 1.35:1 (male: female). Maximum patients were in the age group of 55-75 (64.27%). Gradual hearing loss was found in 778 (95%) patients and 42 (5%) patients presented with sudden sensorineural hearing loss (SSNHL) with bilateral involvement in 675 (82.3%) and unilateral in145 (17.6%) patients. Etiology of SNHL in patients in patients aged more than 15 yrs could be ascertained in 726 cases (94.5%) and commonest cause was found to be presbycusis (85.9%). In patients less than 15 yrs, no apparent cause was found in most of the patients (32.6%) followed by syndromic patients, out of which Down's syndrome was most common. Severity of SNHL was severe in 36.8% followed by moderately severe in 29.8% cases.

Key Words

Etiology, Incidence, Presbycusis. Sensorineural Hearing Loss

Introduction

Hearing skills is one of the most important and pleasurable gifts bestowed by the almighty which affects development of an individual. Sensorineural hearing loss (SNHL) is one of the types of hearing loss in which the root cause lies in the inner ear, vestibulocochlear nerves or central processory centres of the brain. It can be present at birth (congenital) or can develop later in life (delayed). It can be genetic or result from an acquired factor such as disease or injury. The incidence of bilateral SNHL ranges from 1.4 to 3 per thousand live births in various studies worldwide. (1-4). Of the SNHL described in children, 50% is thought to be genetic, 25% acquired and 25% of unknown etiology (3).

The study comprising of cases of SNHL was carried out in Department of otolaryngology and head and neck surgery, Government medical college, Jammu during the period of November'2012 to October'2013. The following were the aims and objectives: To know the incidence ,different etiological factors , age and sex wise distribution of cases presenting with SNHL and to identify the syndromic SNHL patients.as well as to to determine the severity of SNHL.

Material and Methods

Selection of patients: A total of 820 cases with pure SNHL were analyzed for this study from patients attending ENT OPD between November'2012 to October'2013. Case selection was based on following criteria:

a) Cases without any previous history of ear discharge and normal tympanic membrane on Otoscopy.

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b) Cases with pure SNHL (conductive and mixed hearing loss patients excluded), whether congenital or acquired as detected in pure tone audiometry (In patients with age more than 5 yrs) and BERA (In patients with age less than 5 yrs).

Procedure: After detailed case history and ENT examination, Audiological evaluation was performed in Audiology room. BERA was performed in patients less than 5 yrs and SISI, Tone decay, ABLB was done in patients with pure SNHL in patients of age more than 5 yrs confirmed with PTA. Other investigations include examination of blood, urine and MRI of internal acoustic meatus whenever essential.

Results

The Data collected from hospital records, between Nov'2012 to Oct'2013, revealed that SNHL was 19.06 per thousand population of all the patients who attended ENT OPD. Out of total 820, maximum cases were seen in age group of 56-75 yrs (64.27%) and least number of patients were seen in the age group of 46-55yrs (2.68%). 52 patients (6.34%) were below the age of 15 yrs. A total of 472 (58%) cases were males and 348 (42%) cases were females with male to female sex ratio of 1.35:1. The age sex distribution is shown in *table 1*.

Out of 820 patients, those having bilateral hearing loss were 675 (82.3%) and unilateral hearing loss was seen in 145 (17.6%) patients. Amongst unilateral cases, right ear involvement was in 48.2% cases and left ear involvement was in 51.8%,as shown in *table 2*.

In our study of 820 patients 260 patients (36.8%) were having severe hearing loss and only 37 patients(0.45%) had mild hearing loss.

In our study of 820 patients, 42 (5%) presented with sudden hearing and 778 (95%) presented with gradual hearing loss

Out of a total of 768 patients probable etiology of SNHL was found in 726 cases (94.5%) and 42 cases (5.49%) were idiopathic. Out of these 726 cases, 660(85.9%) cases were of Presbycusis, followed by Noise induced in 14 cases (1.82%) and systemic diseases in 29 cases (3.77%). Other causes were Trauma, Otoslerosis, Ototoxic drugs, Vestibular schwannoma and Meniers disease.

Table 3 shows distribution of etiology in different age groups. This indicates that Presbycusis starts after age of 45 yrs. Out of 660 cases of Presbycusis, 420 (64%) were in the age group of 55-75 yrs. All the cases of noise trauma were between age group of 15-45 yrs.

Laterality- In our study 627 patients (82%) were having both ears involved and in 141 cases (18%), only one ear was involved.

No apparent cause could be established in 32.6% cases. Deafness due etiological factors in postnatal period was seen in 23.2% cases, prenatal period in 9.7% cases and intranatal period in 7.6% cases. SNHL associated with congenital syndromes was proven to be in 26.9% of cases and out of them Down's syndrome was the most common syndrome as shown in *table 4*.

Amongst these 52 cases, 40 children presented with congenital SNHL and 12 patients presented later on. Out of 52 patients, 48 patients presented with bilateral hearing loss and only four patients with unilateral.

Discussion

In our study the incidence of SNHL as calculated is 19.06 per 1000 population which is a bit higher as compared to Mathers C *et al* (6), in which they studied global burden of hearing loss in 2000 and reported an age standardized incidence of 3.63 per 1000 males and 3.60 in female patients with an average of 7.1 patients of SNHL per 1000 population. Our higher incidence may be because of difference between the total populations being considered; we have taken only patients attending ENT OPD and they have taken patients globally.

- According to our study, out of 820 patients, majority were in age group of 55-75 yrs (64%). Number of cases below 15 yrs were 52 (6.3%) and 132 cases (16.1%) were above 75 yrs of age. Our results are almost consistent with Eziyi.*et al* (7), who found in their study of 530 SNHL patients attending Nigerian Audiology clinic, that maximum load of SNHL patients were between age group of 55-75 yrs (52.1%) and few patients (18.1%) were seen above 75 yrs of age.

Mosicki JK *et al.* (8) stated that prevalence of hearing impairment (presbycusis) is as high as 83% in people between age of 57 and 89. Percentage of hearing loss in patients less than 15 yrs is 16% which is higher as compared to our study which is 6.3%.

Table.1 Age Sex Distribution (n=820)

Age(yrs)	No. of patients	Percentage (%)	Males	Females	Sex ratio
<15	52	6.34	34	18	1.88:1
15-45	87	10.61	43	44	0.97:1
46-55	22	2.68	17	5	3.4:1
56-75	527	64.27	303	224	1.35:1
>75	132	16.1	75	57	1.31:1
Total	820	100	472	348	1.35:1

Table.2 Monoaural or Binaural (n=820)

Laterality	No. of patients	Right ear	Left ear
Bilateral	675 (82.3%)		
Unilateral	145 (17.6%)	70 (48.2%)	75 (51.8%)
Total	820 (100%)		

Table 3 Etiological Factors of SNHL in Patients with Age > 15 yrs (n=768)

Etiological factors	No. of patients	%age	U/L	B/L	15-45 yrs	45-55 yrs	55-75 yrs	>75 yrs
Presbycusis	660	85.93	111	549	0	90(14%)	420(64%)	200(30%)
Noise	14	1.82	1	13	14(100%)	0	0	0
Trauma	6	0.78	6	0	2(33%)	0	3(50%)	1(17%)
Otoslerosis	2	0.26	2	0	2(100%)	0	0	0
Ototoxic drugs	4	0.52	3	1	4(100%)	0	0	0
Vestibular schwannoma	1	0.13	1	0	0	0	1(100%)	0
Meniers disease	10	1.3	5	5	0	8(80%)	2(20%)	0
Systemic diseases	29	3.77	2	27	0	9(31%)	12(41%)	8(28%)
Idiopathic	42	5.49	10	32	12(29%)	12(29%)	10(24%)	8(18%)
Total	768	100	141(18%)	627(82%)				

Table 4. Apparent Etiological Factors in Children < 15 yrs (n=52)

Apparent etiological factors	No. of patients	%age	U/L	B/L
Prenatal	5	9.7		5
Intranatal	4	7.6		4
Postnatal	12	23.2	2	10
Congenital syndromic	14	26.9		14
No apparent cause	17	32.6	2	15
Total	52	100	4	48

According to our study, out of 820 SNHL patients, nearly 18% presented with unilateral hearing loss and 82% presented with bilateral hearing loss, which is consistent with that of Sculerati N (9), who in a cohort study of 168 patients, found that SNHL was bilateral in 82% and unilateral in 18% cases. Out of 145 patients of unilateral SNHL, in our study, 48.2% patients presented with right ear involvement and 51.8% with left ear involvement which was consistent with the findings of P E Brookhouser *et al.*(10), who in their study of 324 children and adolescents with documented unilateral SNHL at the Boys Town Research Hospital, found that, left ear was affected in 52% and right ear in 48%.

In our study, out of 820 patients, 472 were males and

348 or more females with a sex ratio of 1.35:1. Yanagita N *et al.* (11), in their nationwide survey of SNHL in 1987 in Japan found the sex ratio of 1.1:1. The higher sex ratio in our study is because of the fact that overall incidence of female patients in ENT OPD is less.

Most of the patients in this study had moderately severe (29.3%) and severe SNHL (36.8%) with profound hearing loss in 14% of cases whereas Magnus S.K. Johansson and Stig D. Arlinger (12), in a study of patients in Sweden of age group of 20-30 yrs, maximum patients were of mild hearing loss.

In our study of 820 patients, 42 (5%) presented with sudden hearing loss and 95% with gradual hearing loss in contrast to Hughes GB *et al* (13), who, according to their study labeled that amongst all cases of SNHL in United States, approximately 1% of cases are of sudden SNHL. Maximum patients of sudden SNHL in our study presented with unilateral hearing loss (97.7%) and only 1 patient (2.3%) presented with bilateral sudden SNHL. Our values are consistent with the study of Bruce L. Fetterman MD *et al*. (2), in which they concluded that out of 823 patients of sudden SNHL, 14 (1.7%) had sudden bilateral SNHL and with the study of Yanagita N and Murahashi K (14), who, reported 10 patients with simultaneous bilateral SNHL out of 997(1%).

Presbycusis was found to be the most common cause of SNHL in patients with age > 15 yrs. Similar studies are reported in other studies also. Mathers C et al, [6] and K H Yiap *et al*. (15), reported that the leading causes of adult onset hearing loss are presbycusis followed by noise induced hearing loss though Yanagita N *et al* ,(11), report that the annual number of the patients treated in Japan include the sudden deafness and idiopathic bilateral progressive SNHL as the leading causes of deafness. In our study, maximum number of patients with presbycusis was seen in the patients of age more than 55yrs which is consistent with the results of Mosicki JK *et al*, (8), who stated that prevalence of hearing impairment (presbycusis) is high as 83% in people between the age of 57 and 89 and Schoenborn CA and Marano M (16)who also reported Presbycusis more in patients of age more than 65 yrs in United States. Systemic diseases like Diabetes (commonest), hypertension and thyroid dysfunction were found to be the cause of SNHL in 29 patients out of 768 adult patients (3.7%). Bainbridge K *et al* .(1) reported the risk for SNHL in persons with diabetes. Noise induced hearing loss (NIHL) was noticed in 14 cases (2%) and all the 14 cases were between the age group of 15-45 yrs. In their study of Bangladesh textile factory workers, Md Yusuf Haider *et al*, (17)resulted that incidence of NIHL was 20.59% in workers aged less than 35 yrs and it was 41.38% in age group above 35 yrs. Phillips *et al* .(18), in their study amongst student musicians of age 18-25 yrs (n=329), concluded that overall prevalence of NIHL was 45%. These studies shows that there is age predisposition of NIHL and is more prevalent in early age group of less than 45 yrs. These findings were consistent with our findings since NIHL cases in our study were in age group of 15-45 yrs. Higher prevalence of NIHL in age group of 15-45 yrs can be explained on the fact that this is the age of teenagers hearing loud music and factory employees working in loud noisy atmospheres. Other etiological factors for SNHL were Trauma, Otoslerosis, Ototoxicity, Vestibular schwannoma, Meniers disease and Idiopathi

In our study idiopathic SNHL is the commonest known cause of deafness in children less than 15 (33%). Other apparent causes of SNHL in children included postnatal (meningitis, neonatal jaundice, trauma, ototoxicity) in 23.2% cases, intranatal (birth asphyxia) in 7.6% cases, prenatal (maternal infections, ototoxic drugs taken by mother, radiation exposure of mother during 1st trimester) in 9.7% cases and syndromic SNHL in 30% of cases. Most of them were having bilateral SNHL and only 4 patients were having unilateral hearing loss. Dunmade AD *et al* (3), in their study found that in about a third (34.8%) of patients, causes were unknown, probably congenital and the main acquired causes were febrile illness (18.3%), measles (13.9%), meningitis (8.7%), mumps (6.9%), or severe birth asphyxia (4.3%). Morzaria *et al* , (3), found in their study of children less than 18 yrs of age, that, most common cause of bilateral SNHL are unknown (37.7%), prenatal (12%), perinatal (9.6%), postnatal (8.2%), genetic syndromic (3.2%) and genetic nonsyndromic. The higher number of cases without any apparent cause might be because of higher number of

cases of congenital deafness in our population which goes undiagnosed. This is supported by the fact that 27 children out of 52 in our study were the products of consanguineous marriages known to be a risk factor for congenital deafness as related by Reddy *et al* (20). Our study shows that syndromic patients were 30% and nonsyndromic 70% whereas Monisha Mukherjee et al (21) ,in their study found, syndromic and nonsyndromic patients to be 40% and 60% respectively (22).

Conclusion

The highest numbers of patients having SNHL are seen in the age group of 55-75 yrs with a male preponderance and bilateral involvement. The onset is gradual with moderately severe to severe loss with presbycusis being the most common cause.In maximum cases of SNHL patients aged less than 15 yrs, no apparent cause is found, followed by syndromic children and amongst those syndromic children, Downs syndrome is the most commonly found syndrome.

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