



ETIOLOGY OF DEAFNESS IN KASHMIR- AN OBSERVATIONAL STUDY AT A TERTIARY HOSPITAL

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ARTICLE INFO

Article History:

Received 10th May, 2021

Received in revised form 2nd

June, 2021

Accepted 26th July, 2021

Published online 28th August, 2021

Key words:

Deafness, Etiology, Conductive, Sensorineural.

ABSTRACT

Introduction: Hearing loss is a disorder resulting from a number of causes and is characterized by type and degree of hearing loss.

Aim and Objective: This 1 year observational study was designed and carried out to survey the etiology of deafness in Kashmir.

Material and Method: A total of 200 patients of deafness either complaining of or found on routine testing presenting to ENT OPD were included in the study.

Results: CSOM and ear wax are the two commonest causes of conductive deafness in our study. The commonest cause of sensorineural type of deafness is Presbycusis. Mixed type of deafness was found to be caused by CSOM, Otosclerosis and Idiopathic causes.

Conclusion: Social, economic, educational, psychologic, vocational and medico legal implication point out the urgent need for more comprehensive knowledge and care for person suffering from hearing disability and emphasize the fact that hearing is an integral part of human body functioning.

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INTRODUCTION

Hearing loss or deafness is a broad generic term which implies deviation from normal hearing. It signifies that communication by voice is difficult or impossible without amplification of the sound. Although we may encounter hearing impaired people everyday, we seldom are aware of the impact of hearing loss on an individual or his family.

There are fundamentally three distinct types of deafness.

1. Conductive deafness (outer, middle or inner ear).
2. Sensorineural deafness (inner ear, nerve and nuclei).
3. Mixed deafness (components of conductive and sensorineural elements)

Conduction deafness may arise from any part of transmitting system (External auditory canal to the stapes)

Thullen^[1] states that there are three components to be considered-

1. Pure mechanical impediment (stapes fixation in Otosclerosis).
2. Impairment of acoustic- mechanical transformation of sound (large defects of drum with functional ossicular chain) misadaptation component.
3. Pressure difference between both windows of the inner ear important for optimal hearing.

Sensorineural deafness is caused by affection of the perceiving apparatus i.e. the cochlea or the auditory nerve. It may be of sudden or gradual onset. It can be classified as:

1. Cochlear or sensory or end organ deafness.
2. Neural or Retrocochlear type.
3. Combination involving the above mentioned mechanisms.

A hearing disorder can be described by the time of onset:

- Congenital: present at birth
- Acquired: obtained after birth

Congenital deafness was defined by Van Egmond^[2] as a more or less pronounced loss of hearing, present at birth leading to mutism and is transmitted by heredity or acquired by chemical, mechanical or physical influences. Permanent childhood hearing loss is amongst the most common of the abnormalities seen at birth. The occurrence is approximately 1 to 3 per thousand of otherwise healthy newborns^[3]. Hearing loss is caused by many factors comprising of both genetic and environmental.^[4]

Hearing disorder can also be described by its time course:

- Acute: of sudden onset and short duration
- Chronic: of long duration
- Sudden: having a rapid onset
- Gradual: occurring in small degrees
- Temporary: of limited duration
- Permanent: irreversible

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- Progressive: advancing in degree
- Fluctuating: aperiodic change in degree

Hearing disorder can also be described by whether it involves one or both ears.

- Unilateral: if it involves one ear.
- Bilateral: if both ears are involved.

WHO in the year 1980 recommended classification of hearing loss on the basis of pure tone average threshold of hearing for frequencies of 500, 1000 and 2000 Hz with reference to ISO: 389- 1970.

Severity	Average hearing loss in dB
Normal	0-26
Mild loss	26-40
Moderate	41-55
Moderately severe	56-70
Severe loss	71-90
Profound loss	> 91

The impact of hearing loss on communication depends on factors such as age at onset of hearing loss, whether the hearing loss was sudden or gradual. This impact also depends upon the degree of hearing loss, audiometric configuration, type of hearing loss and speech perception defects.

MATERIAL AND METHOD

This observational study was designed and carried out in ENT Department of SKIMS MCH from January 2019 to December 2019 for a period of one year in order to survey the etiology of deafness in Kashmir. A total of 200 patients of deafness either complaining of or found on routine testing presenting to ENT OPD were included in the study.

Inclusion criteria: All patients with any degree of deafness irrespective of whether their deafness is recent or long standing.

Exclusion criteria: Refusal to participate in the study.

METHODOLOGY

The patient information regarding name, age, sex, religion, occupation, complaints, their mode of onset and progression of hearing loss, associated aural symptoms, history of present and past illness, family history and personal habits were recorded.

The clinical examination started with the general survey of patients. Examination of ENT was carried out systematically. All of this was recorded in a case sheet meant for each patient. The ear examination was done with the help of a Bull’s eye lamp in reference to Shape of the pinna, its position, any deformities or scar marks. Examination of the External auditory meatus and canal was done. Otoscopic examination was then performed to know the tympanic membrane characteristics like color, various landmarks, position, cone of light, any bulgings or retractions or perforations.

The individuals were screened for hearing loss with whisper (at 2 ft. distance from the examiner) and conversation voice tests (2 ft distance from the examiner). Distraction testing was utilized in case of children. Those suspected of a hearing loss were further tested with various tuning fork tests to work up the possible causes of hearing loss. The tuning fork tests that were performed with a 256 Hz, 512 Hz and 1024 Hz frequencies were:

1. Rinne’s test.

2. Weber’s test.
3. Absolute bone conduction test

Nose and paranasal sinus examination was routinely performed in all individuals. Oral cavity and throat examination was also performed to complete the ENT examination and look for any significant relationship with deafness in this study.

Patients with perforated drums as in CSOM were examined under a microscope to study the perforation edges/margins, ossicular continuity, presence of cholesteatomas etc.

All the patients suspected of having a hearing loss were further subjected to audiometry. The side, type, degree and extent of hearing loss was thus measured. Patients thought to be having middle ear diseases were subjected to radiological assessment by HRCT Temporal Bone.

A unique problem arose while examining children. Since the subjective examinations like Tuning fork tests or pure tone audiometry could not be performed due to lack of response from such small children, Brainstem evoked response audiometry was ordered in such cases including the I.Q. assessment of these children.

RESULTS AND DISCUSSION

A total of 200 patients with deafness were included in the study. There were 120 (60%) male patients and 80 (40%) female patients with M:F ratio of 1.5. Similar results were reported by Hofmann [5] (2016) where he reported that the prevalence of deafness in men is 66.66 % and 33.34% in women.

Table no 1 Age prevalence of impairment of hearing

Age in years	Total
0-4	12
5--14	28
15-24	60
25-34	46
35-44	26
45-54	18
55-64	4
>64	6
Total	200

Table 1 shows that majority (60/200) of the patients belonged to the age group of 15-24 years. Next commonest age group observed to have deafness (46/200) was 25-34 years followed by the age group of 5-14 years (28/200). The least number of deafness cases were seen in the age group of 55-64 years (4/200) followed by the age group of > 64 in which a total of 6 cases out of two hundred were seen.

According to National Institute of deafness and other communicable disease report in 2012^[6] maximum number (31%) of deaf patients observed in the study were in the age group of 40-59 years followed by 26 % in the age group of 20-39 years. Next higher prevalence was observed in the age group of 60-69 years (13%) followed by 12% in above 70 years of age. The difference in these results may be due to the lesser number of subjects and lesser elderly population group in my study.

Table no 2 Ear affection in relation to sex and side of ears

Sex	Right Ear (No.)	Left Ear (No.)	Both Ears	Total	Percentage
Male	34	26	60	120	60
Female	12	20	48	80	40
Total	46	46	108	200	100

Table no. 2 shows that both ears are affected more frequently (108/200) than either of the two ears individually. Left ear was seen to be affected in 46 patients (26 males + 20 females). In females, left ear was more commonly involved ear. Right ear disease was seen in 46 patients (34 males + 12 females).

This study shows that both ears are affected more frequently (54%) than either of the two ears individually. Left ear was seen to be affected in 46 patients (23%) (26 males + 20 females). In females, left ear was the more commonly involved ear. Right ear disease was seen in 46 patients (23%) (34 males + 12 females). During the literature search for unilateral or bilateral deafness no articles of relevance could be found, hence no comparisons could be drawn for this study.

Table no 3 Presenting complaints in relation to sex

Presenting complaints	Male	Female	Total (%)
Discharge	22	16	38(19%)
Impairment of hearing	110	76	186(93%)
Heaviness	38	32	70(35%)
Swelling	0	4	4(2%)
Foreign body	2	6	8(4%)
Trauma	4	2	6(3%)
Ringing sensation	28	20	48(24%)
Itching	8	4	12(6%)
Hearing loss	0	4	4(2%)
Pain in ear	12	24	36(18%)

Table no. 3 shows that the commonest symptom presented by the patients in this study was hearing impairment (93%), followed by heaviness in the ear (35%), ringing sensation (24%) and discharge (19%). A study^[7] showed that the commonest symptom presented by the patients with deafness is hearing impairment and heaviness in the ear.

Table no 4 Age Incidence with the different types of disease to cause hearing loss in this study

Diseases	0-4	5-14	15-24	25-34	35-44	45-54	55-64	>64	TOTAL %
Wax		6	10	10	12	2			20
Csom	6	6	12	6	6	4			20
Otomycosis			4	4	2			2	6
Furunculosis		6	4						5
Eust. Catarrh.		2	6	10	6	6	2		16
Congenital	2	2							2
Presbycusis						4	2	4	5
Foreign body	4	2		2					4
Otosclerosis			12	8		2			11
Drug toxicity		2	2						2
Trauma			4	2					3
Ad. Otitis media			2						1
Idiopathic			2	4					3
Viral		2	2						2
Total	12	28	60	46	26	18	4	6	100

The table shows that Chronic Otitis media was the most common cause of deafness along with Impacted ear wax (20% each). Eustachian catarrh was the next most common cause of deafness at 16%, followed by Otosclerosis (11%), Otomycosis (6%), Foreign body (4%), Presbycusis (5%) and Trauma at (3%).

Table No. 5 Relationship of various types of deafness with different types of diseases

DISEASES	CONDUCTIVE	SENSORINEURAL	MIXED	TOTAL (%)
WAX	40			20
CSOM	36		4	20
OTOMYCOSIS	12			6
FURUNCULOSIS	10			5
EUST. CATARRH.	32			16
CONGENITAL		4		2
PRESBYACUSIS		10		5
FOREIGN BODY	8			4
OTOSCLEROSIS	16		6	11
DRUG TOXICITY		4		2
TRAUMA	6			3
AD. OTITIS MEDIA	2			1
IDIOPATHIC		4	2	3
VIRAL		4		2
TOTAL	162	26	12	100

The table shows that ear wax and CSOM were the commonest (20% each) causes of deafness followed by Eustachian catarrh (16%). The least common causes of deafness were adhesive otitis media (1%), viral disease, drug toxicity, and congenital deafness (2% each).

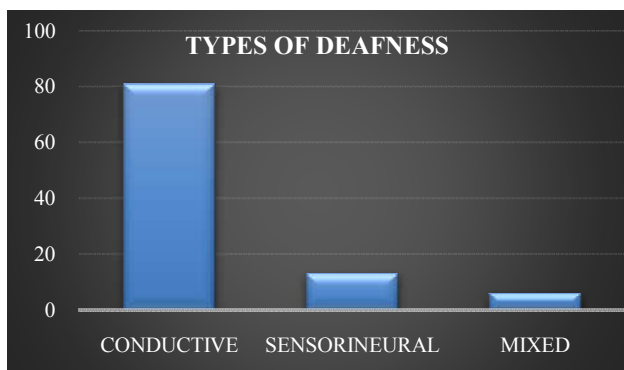
The table also depicts that amongst all causes of conductive deafness, ear wax was the commonest cause of conductive deafness (40 patients), followed by CSOM (36) and Eustachian catarrh (32). The least common cause of conductive deafness found were adhesive otitis (2) and trauma to the ear (6). The commonest cause of sensorineural hearing loss found was Presbycusis (10), followed by drug toxicity, congenital deafness, viral and idiopathic deafness (all 4). Otosclerosis was the commonest cause of mixed hearing loss (6) followed by CSOM (4) and Idiopathic deafness (2).

These findings are consistent with the study by B.M.Minja^[8] who reported that cerumen impaction affected about 15.73% of children with hearing impairment of all causes. WHO in its report on prevalence of deafness in the Southeast Asian region in 2002 estimated a prevalence of ear wax at about 15.9%. Shubha *et al.*^[9] reported that ear wax caused significant moderate conductive hearing loss in all patients. Jitendra^[10] and Rajendra^[11] in their separate studies reported that the second most common cause of deafness in the urban community was ear wax. Adobamen P.R.^[12] in his study also states that ear wax impaction is a common cause of conductive deafness. The joint commonest (20% of all hearing impairments) cause of deafness in this study was chronic suppurative otitis media. These findings are supported by Bhatia *et al.*^[13] who reported a prevalence of 30% of chronic otitis media in his study. Mishra^[14] reported a prevalence of CSOM of 13.9% in his study In his report, Fargus^[15] established a close relationship between increasing age and level of hearing loss. Musani^[16] reported a prevalence of 2.5% in his study of 120 patients with sensorineural hearing loss. R.S. Bishit^[17] reported a high prevalence of Presbycusis (37%) in his subjects. The differences in these results might be due to a lesser number of aged patients in my study (28 patients above 45 years) to 144 patients above 40 years of age in his group.

In this study the prevalence of congenital deafness was found to be 2%. All the four children were below 14 years of age and all were females. These findings are supported by the study done by Russ *et al.*^[18]. He reported a prevalence of 3% congenital hearing loss in children in Victoria Australia. The other lesser common causes of sensorineural deafness in this study were Idiopathic deafness (3%) and deafness due to viral causes (2%).

Ototoxicity contributed 2% of the deafness subjects in this study. 50% of the cases belonged equally to the age groups of 15-24 years and 5-14 years. The patients had a history of being treated for Pulmonary TB, presumably with streptomycin and some had a history of having received treatment with aminoglycosides.

Mishra^[19] reported the prevalence of ototoxicity in his study at 10% of cases of sensorineural deafness. Mosani reported ototoxicity at 1.7% in his study. Work done by other authors like Cohen^[20] has attributed viral aetiology as a significant cause of sensorineural deafness.



Graph no 1 A graphic representation of the type of deafness encountered in our study.

The graph shows that conductive deafness was the commonest type of deafness observed (162/200 cases) followed by sensorineural deafness (26/200 cases) and mixed deafness (12/200 cases)

In our study the predominant type of deafness was conductive deafness (81%) followed by sensorineural deafness (13%) and mixed deafness (6%).

This is in close agreement with studies by Mishra^[21], Rajendra^[11], Jitendra^[10] and Tuli^[22] et al. All of them report a higher prevalence of conductive deafness than sensorineural and mixed deafness.

Table No. 6 Degree of hearing loss and percentage of patients.

DEGREE OF HEARING LOSS	% CASES
MILD	46
MODERATE	30
MODERATELY SEVERE	18
SEVERE	4
PROFOUND	2

The degree of deafness in our study was mild (46%), moderate (30%), moderately severe (18%), severe (4%) and profound in 2% of cases.

Bisht^[17] reports the prevalence of mild(22%), moderate (23.45%), moderately severe 22.8%), severe (7.2%) and profound (7.2%). 12.2 % cases had a normal hearing. Studies performed by Mishra^[21], Tuli^[22] and Rajendra^[11] also report majority of patients with mild deafness and the number of cases decreases with increasing severity of deafness.

CONCLUSION

From this study following conclusions were drawn:

1. Deafness was complained of as impairment of hearing, fullness in ears, ringing sensation in the ears with or without impairment of hearing.

2. Conductive deafness is the most common type of deafness.
3. CSOM and ear wax are the two commonest causes of conductive deafness in our study.
4. Eustachian catarrh, furunculosis, otomycosis, foreign body, Otosclerosis, trauma are the other lesser frequent causes of conductive deafness in this study.
5. The second most common type of deafness after conductive deafness is Sensorineural type of deafness.
6. The commonest causes of sensorineural type of deafness are Presbycusis, Congenital, Drug toxicity, Idiopathic and Viral.
7. The third type of deafness after conductive and sensorineural type is mixed deafness. It was found to be caused by CSOM, Otosclerosis and Idiopathic causes.
8. Administration of anti tubercular, aminoglycosides drugs as the cause of ototoxic deafness were found to be responsible factors for deafness.
9. Depending upon the severity of deafness based on the audiometric findings, deafness has been classified into mild, moderate, moderately severe, severe and profound. The prevalence in our study revealed 46%, 30%, 18%, 4% and 2% respectively.
10. Incidence of deafness revealed a presence of 60% in males and 40% in females.
11. Age incidence of deafness revealed 30% in the age group of 15 years to 24 years, 23 % in 25-34 years, 14 % in 5-14 years, 13% in 35-44 years, 9% in 45-54 years, 6% in 0-4 years, 3% in 64 years and above and 2% in 55-64 years.

References

1. Thullen A “Middle ear conduction deafness and bone conduction”. Archives of Otolaryngology 1955.
2. Van Egmond: *Journal Laryngology & Otology* 1954. July 68(7): 429-43.
3. Vohr BR, Oh W, Stewart EJ, et al: Comparison of costs and referral rates of 3 universal newborn hearing screening protocols. *J Pediatrics* 139(2):238, 2001.
4. Morton CC, Nance WE: Newborn hearing screening—a silent revolution. *N Engl J Med* 354(20), 2006.
5. Hoffman HJ, Dobie RA, Losonczy KG, Themann CL, Flamme GA. Declining Prevalence of Hearing Loss in US Adults Aged 20 to 69 Years. *JAMA Otolaryngology – Head & Neck Surgery*. December 2016 online.
6. National Center for Health Statistics, Data from the National Interview Survey, Series 10, Number 188, Table 4, 1994.
7. Logan turner otolaryngology 1st edition.
8. B.M. Minja “Prevalence of otitis media, hearing impairment and cerumen impaction among school children in rural and urban Dar es Salaam, Tanzania”. *International journal of pediatric Otolaryngology*. September 1996 Volume 37, Issue 1, Pages 29–34.
9. Shubha et al. www.entjournal.com/Media/ Publications Article/SUBHA-10_06.pdf
10. Jitendra Pal et al. (1974) “Deafness among the urban community” *Indian journal of Medical Research* 62: 857-868.
11. Rajendra K.P.V.(1974) “A study of incidence and aetiology of deafness in a south Indian population”. *Indian journal of Otolaryngology* 26: 153-157.

12. Adobamen PR.(2012) "Hearing loss due to wax impaction" *Nigerian journal of hospital medicine* 2012 April- June 22: 117-120
13. Bhatia *et al.* *Indian journal of otolaryngology*17: 1965.
14. Mishra RN *et al.* "Incidence of deafness in an urban community and its effect on socioeconomic conditions". ICMR enquiry 1970
15. Fargus P. "The cochlear and vestibular function in old age". *ActaOtolaryngol*; 1957 1: 5-10.
16. Musani *et al.* "Frequency and causes of hearing impairment in tertiary care center". *Journal of Pakistan medical education February* 2011.
17. Bisht R.S. *et al.* "An epidemiological study on hearing loss and its demographic characteristics within Garhwal region of Uttarakhand" *Indian journal of otology* 2016 volume 22 Issue 2: Page 105-109.
18. Russ *et al.* "Epidemiology of congenital hearing loss in Victoria Australia". *International journal of audiology* 2003:42; 385-390.
19. B.M. Minja "Prevalence of otitis media, hearing impairment and cerumen impaction among school children in rural and urban Dar es Salaam, Tanzania". *International journal of pediatric Otolaryngology. September* 1996 Volume 37, Issue 1, Pages 29–34.
20. Cohen *et al.* "Viral Causes of Hearing Loss: A Review for Hearing Health Professionals". *Journal Trends Hearing* 2014 :18
21. Mishra Rajendra (1983) "Deafness in tribes of South Bihar". *Patna Journal of Medicine*, 57:40-44.
22. Tuli B.S., Parmar T.L "Incidence of deafness in school going children". *Indian journal of Otolaryngology* vol 40, No. 4, December (1988).

How to cite this article:

Omar Ashraf *et al* (2021) 'Etiology of Deafness In Kashmir- An Observational Study At A Tertiary Hospital', *International Journal of Current Advanced Research*, 10(08), pp. 24991-24995.
DOI: <http://dx.doi.org/10.24327/ijcar.2021.4984.24995>
