ORIGNAL ARTICLE

Incidence of Unilateral Sensorineural Hearing Loss in a Tertiary Hospital in Northeastern India: A Retrospective Study

Sheena K. Gupta[1], Neizekhotuo Brian Shunyu[2], Hanifa Akhtar[3], Jijitha Lakshmanan[4], Nisha Kumari[5]

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ABSTRACT

Background: Unilateral Sensorineural Hearing Loss (USNHL) poses a significant yet under-recognized health burden, impairing spatial sound localization and speech discrimination. While commonly overshadowed by bilateral hearing loss, its psychosocial and functional impacts warrant dedicated investigation.

Objective: To determine the incidence and severity of USNHL among patients.

Methods: A retrospective analysis of pure tone audiometry (PTA) data was conducted over 18 months (January 2024–June 2025) at AIIMS Guwahati. A total of 4000 patients were assessed for hearing complaints, and 269 were identified with USNHL.

Results: Unilateral Sensorineural Hearing Loss accounted for 6.7% of all hearing loss cases reviewed. A male predominance (63.1%) was observed. The most affected age group was 41–50 years (21.5%), and the majority (36.4%) presented with profound hearing loss. Mild hearing loss was also noted (31.5%), that is indicates functional limitations even in early stages.

Conclusion: Unilateral Sensorineural Hearing Loss is often overlooked with considerable functional implications. Early identification through PTA and community awareness is essential. The study highlights the need for early identification and auditory rehabilitation tailored to unilateral hearing loss patients.

Keywords: Unilateral hearing loss, incidence and severity.

INTRODUCTION

Hearing loss is becoming more common in society, increasing burden can be attributed to a variety of factors, including aging. It represents a serious risk to social development, communication, backwardness, and auditory processing. In India, the prevalence of adult-onset deafness is approximately 7.6%. In the Indian population, 7.9% to 13.3% have been reported to have unilateral sensorineural hearing loss (USNHL). Sensorineural Hearing Loss (SNHL) with an air conduction threshold of >25 dB and an air-bone gap of <10 dB that is exclusive to one ear, while the other ear is fully normal, is known as Unilateral Sensorineural Hearing Loss.[1] The vestibulocochlear nerve, the inner ear, or the brain's central processing centre are the sites of pathology in sensorineural hearing loss (SNHL). Sensorineural hearing loss can be mild, moderate, severe, or profound. The majority of the causes of sensorineural hearing loss are cochlear origin only; a few cases are retrocochlear origin. Many internal and external deterministic factors interact to cause sensorineural hearing loss (SNHL). A patient's hearing may be predetermined throughout their lifespan by genetics and age-related changes, and any such changes may be accelerated over time by a variety of external circumstances.[2] Although a number of vascular, immunological, and infectious reasons have been suggested, the cause is typically unknown. Patients should

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Senior Resident[1], Professor and Hod[2], Associate professor[3], Assistant professor[4], Junior Resident[5]
Department of ENT-HNS
All India Institute of Medical Science (AIIMS), Guwahati, Assam, India

Corresponding Author: Sheena K. Gupta
Senior Resident, Department of ENT-HNS
All India Institute of Medical Science (AIIMS), Guwahati, Assam, India

Email ID: sheena804@gmail.com

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be referred immediately for additional evaluation after a thorough examination is completed to rule out potentially fatal or curable causes, such as vascular events and cancerous disorders.

In addition to etiology, several connected factors, such as vertigo and tinnitus, also predict the associated outcome and enhance morbidity, which limits the outcome of management. In general, patients with severe-to-profound USNHL have trouble (a) identifying the source of sound and (b) identifying sound in background noise or when the signal enters the worse ear. Sound localization, speech discrimination in noisy environments, familiar sound recognition, and listening convenience all depend on binaural hearing. It was discovered that individuals with unilateral deafness could only hear between 30 to 35% of the discussion when voice and background noise were provided at the same level.[2] There is a need for a clinical study to find the pattern of the degree of hearing loss in different age groups, sex, and among patients. By doing this study, we can identify the demographic profile of unilateral sensorineural hearing, as well as age, sex, onset, and grading of hearing. This helps us to identify the magnitude of the problem and further evaluate and strategize to prevent and treat it.

MATERIALS AND METHODS

This is a retrospective study on the pure tone audiometric (PTA) data, irrespective of age and sex, from January 2024 to June 2025, who visited the outpatient department (OPD) of Otorhinolaryngology and Head and Neck Surgery, AIIMS Guwahati, with a complaint of HL. Based on PTA, the types of hearing impairment were categorized as conductive/sensorineural/mixed and unilateral/bilateral. Pure tone audiogram (PTA) records of 4000 cases who had complained of hearing impairment were analyzed to determine the incidence of USNHL (excluding the cases of mixed HL). This group of USNHL was studied further for demography, type, laterality, and severity of HL with the aims and objectives to: 1) Know the incidence of USNHL in cases complaining of HL. 2) Establish the type and degree of USNHL in cases. Inclusion Criteria were cases with USNHL (other ear being normal) based on PTA. Exclusion criteria were patients with conductive HL, mixed HL, bilateral SNHL, or operated patients.

RESULTS

A total of 4000 PTAs were done, out of which 269 patients (6.72%) were reported to have unilateral sensorineural hearing loss in our centre in 18 months. The majority of patients were males (63.1%), as presented in Table 1. Table 2 presents the degree of hearing loss and Gender distribution. The majority of the patients were diagnosed at the profound hearing loss stage (36.4%), followed by mild hearing loss, then moderate hearing loss, out of which the majority were again males. Table 3 presents the age and gender distribution. Most of the patients presented in the 4th decade of life, 21.5% were within the age group of 41-50 years, followed by the 3rd and 5th decades. There were 2 female patients below the age of 10. And total of 10 patients below the age of 18, the majority again being males.

Table 1: Gender distribution

Laterality	Number (%)
Male	170 (63.1%)
Female	99 (36.8%)
Total	269

Table 2: Degree of hearing loss and Gender distribution

Degree of hearing loss		Males	Females	Total
Mild	(26-30dB)	51	34	85
Moderate	(41-55dB)	28	14	42
Moderately severe	(56-70dB)	8	12	20
Severe	(71-91dB)	15	9	24
Profound	(>91db)	68	30	98
Total		**170**	**99**	**269**

Table 3: Age and gender distribution

Age	Males	Females
0-10	0	2
11-20	23	11
21-30	27	19
31-40	39	13
41-50	35	23
51-60	30	22
61-70	14	8
71-80	2	1
Total	170	99

DISCUSSION

Hearing impairment is one of the most prevalent chronic conditions after hypertension and arthritis. Over 5% of the world's population—360 million people—have disabling HL. The incidence of USNHL varies in different studies and ranges from 3.24% to 19.3%.[3-5] It is challenging to gather data that would give a true picture of the prevalence of the issue because of the possibility that people may under report hearing impairment because of their low educational attainment, lack of knowledge about government programs, and pressures from family, society, and beliefs. An easily accessible, reliable, and well-preserved data pool pertaining to statistics on individuals with hearing impairments and directly tied to government benefit programs could be one of the possible sources for the necessary information. Just as we use two eyes to see in three dimensions, we use two ears to perceive the world of sound around us. This "dimensional hearing" is made possible by binaural hearing. A person

with monaural hearing loses the ability to 'map' the sound in space, pick out soft sounds, and separate a single voice from the surrounding background noise. Unilateral hearing loss is relatively uncommon compared to bilateral SNHL. Audiometric data of 252 patients suffering from hearing loss in an Indian retrospective study showed that 163 patients (66.5%) had SNHL, out of which only 6 cases (3.7%) had USNHL.[4] Unilateral hearing loss, though not common in the pediatric age group, is found in both children and adults. In children, it is mostly detected on screening. They do not, as a routine, present as OPD cases. In our study, 10 patients were below 18 years of out, of whom 2 females were below 10 years. In our study majority of patients' ages ranged from 31-60 years, mean age being 38.6 years; 21.5% were within the age group of 41-50 years, followed by the 3rd and 5th decade. Bansal et al in their study found that the age of patients ranged from 9 years to 76 years (mean age being 41.5 years), the maximum patients were in the 3rd decade (23.87%), followed by the 2nd (21.29%) and 4th decade (21.29%).[3] Augustine et al. conducted a prospective study on 50 Indian adults (aged 14 to 62 years) with Unilateral Sensorineural Hearing Loss (USNHL). The majority of the study population was aged from 21 to 40 years.[6] The majority of patients in our study were males (63.1%) out of 269 patients. Similar results were seen in many studies.[1,3,4] In our study of USNHL, most of the patients across the spectrum of severity of HL presented to the hospital when their HL ranged from Severity of USNHL from profound 98(36.4%), mild 85 (31.5%), moderate 42 (15.6%), severe 24 (8.9%) to moderate severe 20(7.4%). This data had a similar trend to that of a study done by Varshney S et al.[1] This study indicates that even mild HL is noticed by most of the patients (32.1%), because it causes them significant problems in their daily activities. In Bansal et al study on USNHL severity of HL ranged from mild (34.2%) to profound (31.96%).[3]

CONCLUSION

According to our study, among patients who complain of HL, USNHL-type hearing loss is not uncommon (6.72%). Psychological and functional effects are underappreciated in patients with USNHL. To understand the incidence, functional and psychological effects, and available treatments, further research and studies are needed in the area of USNHL.

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