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Original Research Article

A clinical study on sudden sensorineural hearing loss in tertiary care setting

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ABSTRACT

Background: Sudden sensorineural hearing loss (SSNHL) is defined as a hearing loss of ≥30 dB over at least three contiguous frequencies within 72 hours. Despite multiple theories, in most cases, no definitive cause is identified, making the condition idiopathic. Vascular, infectious, and autoimmune mechanisms are often implicated. Given the unpredictable nature of SSNHL and variability in recovery, understanding its etiology, symptomatology, and severity patterns is essential for clinical management.
Methods: A cross-sectional observational study was conducted on 77 patients at R.S.D.K.S. GMC and MRD Memorial Hospital. Patients underwent audiological, vestibular, hematological, and imaging assessments. Severity of hearing loss and symptom associations were evaluated.
Results: Most affected age group was 31–40 years (22.08%). Male predominance was evident (70.13%). The most frequent symptom was aural fullness (44.16%). Profound hearing loss was most common (37.66%). Major known causes included diabetes and hypertension (9.09% each), while 64.94% of cases remained idiopathic.
Conclusion: SSNHL predominantly affects middle-aged males and often presents with profound loss. Most cases are idiopathic. Early diagnosis and intervention are critical to improving outcomes.

Keywords: SSNHL, Idiopathic hearing loss, Sudden deafness, Aural fullness

INTRODUCTION

Sudden sensorineural hearing loss (SSNHL) is defined by a hearing loss of 30 dB or greater over at least three adjacent audiometric frequencies happening within 72 hours typically, the condition is unilateral, with bilateral cases being exceedingly rare.[1] De Kleyn was the first to describe this disease in 1944.[3] The majority of cases are idiopathic, “only 5–10% of cases have an identifiable cause”. “Possible causes include viral, autoimmune, vascular, traumatic, neoplastic, and idiopathic etiologies.”. most frequent causes identified were infectious (13%), otologic (5%), traumatic (4%), vascular or hematologic (3%), neoplastic (2%), and other (2%).[4] Several theories attempt to explain SSNHL, including disturbances in cochlear blood flow, viral infections, autoimmune disorders, and ruptures of Reissner's membrane.[5] Currently, the most supported theories for idiopathic SSNHL involve a viral origin or a vascular event within the cochlea, which leads to a sudden increase in hearing thresholds and deterioration in speech discrimination.[5] The term "idiopathic" refers to cases where no identifiable cause for the hearing loss is found. The etiology and management of idiopathic SSNHL remain controversial. Hearing recovery can vary widely: it may be incomplete, partial, or complete. Factors influencing recovery include the timing of treatment initiation, the age at which hearing loss begins, the severity of the hearing loss, the affected audiometric frequencies, and the presence of vertigo.[6] Cochlear function relies heavily on a substantial supply of oxygen, particularly because the stria vascularis and the organ of

corti have high energy needs. In patients with SSNHL, the oxygen levels in the perilymph often drop markedly. Administering oxygen might enhance cochlear metabolism.[7] Through comprehensive history-taking, thorough physical examination, and laboratory assessments including vestibular evaluations, audiological evaluation, temporal bone imaging studies, and blood investigations as per patient requirement, one can find out the etiology and treat accordingly.[8]

The objective of this study was to evaluate the clinical, demographic, and audiological profiles of patients presenting with SSNHL. Specifically, the study aimed to analyze the distribution of age and gender, assess the severity and audiometric patterns of hearing loss, and examine associated symptoms such as tinnitus, vertigo, and aural fullness. Additionally, the study sought to identify potential etiological factors and determine the proportion of idiopathic versus secondary causes, including systemic conditions such as diabetes and hypertension, viral infections.

METHODS

Study design

This was and observational, cross-sectional study.

Study place

ENT Department, R.S.D.K.S. GMC and MRD Memorial Hospital, Ambikapur.

Study duration

The study duration was from May 2023 to January 2025.

Sample size

The sample size was of 77 patients.

Inclusion criteria

Adults >18 years with sudden-onset unilateral or bilateral SNHL.

Exclusion criteria

Chronic SNHL, conductive loss, ototoxicity, fluctuating hearing loss.

Methods

History, ENT examination, tuning fork tests, pure tone audiometry (PTA), tympanometry, vestibular testing, blood investigations, and imaging were performed.

Hearing loss was graded and audiogram patterns were categorized. Data analysis was conducted using SPSS v27.0; $p < 0.05$ was considered significant.

Ethical clearance

The study was approved by the Institutional Ethics Committee of R.S.D.K.S. GMC, Ambikapur.

Informed consent

Written informed consent was obtained from all participants prior to inclusion in the study.

RESULTS

The present study included a total of 77 patients diagnosed with SSNHL at R.S.D.K.S. Government Medical College and Mata Rajmohini Devi Memorial Hospital. The most commonly affected age group was 31–40 years, comprising 22.08% of the total sample, followed by the 21–30 years group at 20.78%. The lowest prevalence was noted in the ≤10 years group (1.3%) and those over 80 years (2.6%).

In terms of gender, a clear male predominance was observed, with 70.13% of the patients being male and 29.87% female. Regarding, the severity of hearing loss, the most common degree was profound hearing loss, observed in 37.66% of cases.

This was followed by moderately severe (20.78%), severe (16.88%), moderate (14.29%), and mild hearing loss (10.39%). Subjective symptomatology revealed that aural fullness was the most frequently reported symptom, present in 44.16% of patients.

Table 1: Age distribution of patients with SSNHL.

Age group (in years)	Number	%
≤10	1	1.3
11–20	7	9.09
21–30	16	20.78
31–40	17	22.08
41–50	13	16.88
51–60	9	11.69
61–70	5	6.49
71–80	7	9.09
>80	2	2.6
Total	77	100

Tinnitus and vertigo were each reported by 12.99% of the cases. Analysis of causative factors demonstrated that 64.94% of cases were idiopathic, i.e., without a known cause. Among the identifiable causes, diabetes mellitus and hypertension were the most common, each present in 9.09% of patients.

Other causes included mumps (7.79%), *Herpes zoster* (2.6%), viral parotitis (2.6%), hypothyroidism (1.3%), and COVID-19 (1.3%). One patient had both hypertension and diabetes.

Table 2: Gender distribution of SSNHL patients.

Gender	Number	%
Male	54	70.13
Female	23	29.87
Total	77	100.00

Table 3: Degree of hearing loss in SSNHL patients.

Degree of loss	Number	%
Mild	8	10.39
Moderate	11	14.29
Moderately severe	16	20.78
Severe	13	16.88
Profound	29	37.66
Total	77	100.00

Table 4: Symptomatology associated with SSNHL.

Symptom	Number	%
Tinnitus	10	12.99
Vertigo	10	12.99
Aural fullness	34	44.16

Table 5: Identifiable causative factors in SSNHL.

Cause	Number	%
Diabetes mellitus	7	9.09
Hypertension	7	9.09
Herpes zoster	2	2.60
HTN+DM	1	1.30
Hypothyroidism	1	1.30
Mumps	6	7.79
Viral parotitis	2	2.60
COVID-19	1	1.30
Idiopathic	50	64.94
Total	77	100.00

DISCUSSION

This study provides a comprehensive analysis of the demographic, clinical, and epidemiological characteristics of a sample population of 77 individuals, focusing on age distribution, gender differences, hearing loss severity, laterality, symptoms, causative factors, and tribal representation.

Age distribution

The largest age groups are 31–40 years (22.08%) and 21–30 years (20.78%), forming the core of the sample and consistent with Kim et al.[9] Middle-aged groups-41–50 years (16.88%) and 51–60 years (11.69%) also have substantial representation, indicating hearing loss extends well into later adulthood.

The ≤10 years group (1.3%) shows the lowest representation, similar to Yeo et al (1.6%), likely due to underdiagnosis or limited screening. The elderly >80 years group also shows low representation (2.6%), which may indicate reduced life expectancy in the region or lower healthcare-seeking in this population.[11]

Gender distribution

Males form the majority (70.13%) of the sample, outnumbering females in most age groups. Factors contributing to male predominance may include. Greater occupational noise exposure in males, higher healthcare-seeking behavior in men due to cultural/economic independence Underreporting among females due to social or access barriers. However, other studies differ Ha et al reported no significant gender difference, Alexander et al noted only a slight male predominance (1.07:1), and Schreiber et al found no sex preference.[10,12,13]

Symptom profile

The most common reported symptom is aural fullness (44.16%), likely due to Eustachian tube dysfunction, middle ear pathology, or sensorineural causes. Tinnitus (12.99%) and vertigo (12.99%) follow, suggesting possible inner ear involvement, vestibular disorders, or noise-induced hearing loss. Spontaneous vertigo was reported in 11.8% of cases in Xie et al.[14] These findings support a strong link between hearing loss and vestibular dysfunction, indicating the need for multidisciplinary care involving ENT, audiology, and neurology services.

Severity of hearing loss

The most prevalent hearing loss category is profound (37.66%), indicating a high burden of severe auditory impairment often requiring interventions such as hearing aids or cochlear implants. This is followed by: moderately severe–20.78%, severe–16.88%, moderate–14.29%, mild–10.39% (least common).

These results are comparable to Xie et al who reported mild (13.3%), moderate (13.6%), moderate to severe (16.2%), severe (23.6%), and profound (33.3%) hearing loss.[14] The predominance of severe-to-profound cases underscores the urgent need for early detection and intervention programs.

Etiology

A majority (64.94%) of cases are idiopathic, reflecting possible diagnostic limitations and unrecognized genetic or environmental influences. Among known causes Hypertension (HTN)–9.09%, diabetes mellitus (DM)–9.09%, viral infections: mumps (7.79%), *Herpes zoster* (2.6%), viral parotitis (2.6%), systemic illnesses:

HTN+DM (1.3%), thyroid dysfunction (1.3%), COVID-19 (1.3%). These results align with studies reporting identifiable causes in 7–45% of SSNHL patients with thyroid dysfunction rates matching Ackah et al and Narozny et al.[16,17]

CONCLUSION

Early detection and intervention are critical, especially for individuals with mild hearing loss, to prevent progression to severe impairment. Public health initiatives should focus on hearing loss prevention, particularly among high-risk groups such as diabetics, hypertensive individuals, and those exposed to occupational noise. Increased healthcare access for women and tribal populations is necessary to address disparities in diagnosis and treatment. Further research is needed to understand the high proportion of idiopathic hearing loss cases and to explore possible genetic or environmental links.

This study highlights the complex nature of hearing loss, influenced by demographic, clinical, and socioeconomic factors. The high prevalence of profound hearing loss, unilateral cases, and idiopathic causes underscores the urgent need for improved diagnostic measures, better healthcare accessibility, and proactive intervention strategies. By addressing these challenges, healthcare providers can enhance the quality of life for individuals with hearing impairments and contribute to better hearing health outcomes for the population.

SSNHL can be managed through several therapeutic approaches. Commonly used measures include administration of high-dose corticosteroids to reduce inflammation and improve cochlear blood flow, antiviral therapy, infusion of low molecular weight dextran, nutritional supplementation, and hyperbaric oxygen therapy. Patients who seek medical attention at an early stage and have no significant comorbidities, particularly those with mild to moderate SSNHL, often demonstrate rapid and nearly complete recovery. On the other hand, individuals presenting late, with associated comorbid illnesses or with profound hearing loss, usually achieve only partial or minimal improvement.

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