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A Clinical Study Of Different Causes & Quality Of Life In Unilateral Sensorineural Hearing Loss

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ABSTRACT

Background: Unilateral sensorineural hearing loss (USNHL) affects one ear and can impact communication and quality of life. It has varied causes, often remaining idiopathic despite evaluation. This study explores the underlying causes and their effect on quality of life to guide timely diagnosis and management.

Method: This descriptive prospective study was conducted at the ENT department of IIMSR from May 2023 to December 2024. Patients aged 7 years and above with unilateral sensorineural hearing loss were evaluated through audiological tests, vestibular assessments, BERA, and MRI when indicated. Blood tests assessed metabolic and inflammatory markers. Quality of life was measured using HEAR-QL for children and AQoL-8D for adults.

Results: Most participants were middle-aged, and tinnitus emerged as the most common associated symptom. Idiopathic causes were the predominant etiology, followed by sudden sensorineural hearing loss (SSNHL) and Meniere's disease. A satisfactory quality of life (QOL) was reported by 58.5% of patients. No statistically significant association was found between QOL and factors such as age, gender, hearing threshold (PTA), comorbidities, or biochemical markers. However, a shorter duration of hearing loss was significantly linked to bad QOL ($p = 0.001$). These findings highlight the importance of early diagnosis, comprehensive evaluation, and timely management to enhance patient outcomes.

Conclusion: Idiopathic causes were the most common in USNHL, followed by SSNHL, Meniere's disease, and congenital factors. Tinnitus was the most frequent symptom, often with vertigo. Many cases remained unexplained despite thorough evaluation. Quality of life was more affected in recent-onset cases, though not linked to age or severity. Early diagnosis, rehabilitation, and public awareness are key to improving outcomes.

Keywords: *Hearing Loss, SensorineuralHearing Loss, Unilateral Hearing LossQuality of Life, Audiometry, Pure-Tone, Tinnitus, Sudden Hearing Loss*

1. INTRODUCTION

Unilateral hearing loss (UHL) refers to normal hearing in one ear and reduced hearing in the opposite ear. As per the "National Workshop on Mild and Unilateral Hearing Loss," permanent UHL is defined by a pure tone air conduction threshold averaging ≥20 dB HL at 500 Hz, 1000 Hz, and 2000 Hz, or thresholds exceeding 25 dB HL at two or more frequencies above 2000 Hz in the affected ear. In contrast, the unaffected ear should have an average threshold of ≤15 dB HL.

In India, the number of individuals affected by hearing loss exceeds 63 million, accounting for over 6% of the population [2]. Unilateral sensorineural hearing loss (USNHL) is characterized by hearing impairment in one ear with an air-bone gap of less than 15 decibels, while the opposite ear maintains normal hearing. The reported incidence of USNHL ranges between 3.2% and 19.4% [3].

The causes of USNHL are varied and include viral infections, Meniere's disease, acoustic neuroma, head trauma, autoimmune conditions, and idiopathic origins. Despite advances in diagnostic tools such as MRI and audiometric profiling, a significant number of USNHL cases remain without a clearly identified cause [4,5].

Management of USNHL presents challenges due to the asymmetry in hearing. Treatment options like contralateral routing of signal (CROS) hearing aids, bone-anchored hearing systems, and cochlear implants may help improve auditory function, but their effectiveness on improving QOL is still being evaluated [6]. Furthermore, USNHL is associated with psychosocial difficulties including increased listening effort, fatigue, social isolation, and decreased participation in everyday activities, underscoring the need for comprehensive clinical assessment beyond audiological measures alone [7].

This clinical study aims to investigate the spectrum of etiologies causing USNHL and to evaluate the impact of this condition on patients' quality of life, thereby helping clinicians develop targeted interventions to improve both hearing outcomes and psychosocial well-being.

Methodology:

This descriptive prospective study was conducted in the ENT department of Integral Institute of Medical Sciences and Research (IIMSR) from May 2023 to December 2024. In this study a total of 106 patients, aged 7 years and above presenting with unilateral sensorineural hearing loss, without evidence of conductive pathology, were enrolled after obtaining written informed consent. Patients with conductive ear pathology, a history of ear surgery (such as tympanoplasty or modified radical mastoidectomy), and children below 7 years of age were excluded from the study.

Clinical evaluation included Pure Tone Audiometry, Impedance Audiometry, vestibular tests (Dix-Hallpike, head thrust, and fistula tests), and Brainstem Evoked Response Audiometry (BERA) to assess for retrocochlear pathology. MRI of the temporal bone with gadolinium contrast was performed in suspected cases of retrocochlear lesions. Blood investigations included HbA1c, lipid profile & thyroid function tests Quality of life was assessed using the HEAR-QL questionnaire for children and the AQoL-8D questionnaire for adult patients.

Statistical analysis:

Data were analyzed using SPSS version 20 and STATA version 12. Associations were tested using the Chi-square test, with $p < 0.05$ considered statistically significant.

2. RESULTS

Table 1: Quality of Life (QOL) in Study Participants

QOL	N	%
Yes	62	58.5%
No	44	41.5%
Total	106	100.0%

Table 1 presents the assessment of Quality of Life (QOL) among the study participants. Out of a total of 106 individuals, 62 participants (58.5%) reported having a satisfactory quality of life, while 44 participants (41.5%) indicated an unsatisfactory or compromised quality of life. This distribution suggests that a majority of the study population experienced a relatively positive perception of their well-being, although a substantial proportion still faced challenges affecting their overall quality of life.

Table 2: Descriptive Statistics of Clinical and Demographic Parameters

	Mean	SD	Median	Min	Max	Valid N
Age	42.93	15.98	45.00	12.00	85.00	106
PTA-AC threshold	71	23	73	30	107	106
TFT- TSH	6.26	.27	6.16	5.96	6.60	6

RBS	199.60	26.43	199.00	170.00	230.00	10
Lipid-Triglyceride	312.89	14.63	315.00	300.00	338.00	9
CBC-Hb	8.29	3.09	10.00	4.00	11.00	7

Table 2 provides descriptive statistics for various clinical and demographic parameters of the study participants. The mean age of the participants was 42.93 years with a standard deviation (SD) of 15.98, ranging from 12 to 85 years, indicating a wide age distribution. The Pure Tone Audiometry - Air Conduction (PTA-AC) threshold had a mean of 71 dB, SD of 23, and ranged from 30 to 107 dB, reflecting varied degrees of hearing impairment. Thyroid function, represented by TSH levels, showed a narrow range with a mean of 6.26, SD of 0.27, across 6 valid cases. Random Blood Sugar (RBS) levels averaged 199.6 mg/dL with an SD of 26.43, indicating elevated glucose levels in the small subset of 10 individuals. Triglyceride levels had a mean of 312.89 mg/dL (SD = 14.63) across 9 cases, suggesting hypertriglyceridemia. Lastly, hemoglobin (Hb) from complete blood counts (CBC) showed a mean of 8.29 g/dL with a wide SD of 3.09, indicating anemia in the 7 tested participants.

Table 3: Comparison of Age with Quality of Life (QOL)

	QOL						
	Yes		No		Total		p value
	Mean	SD	Mean	SD	Mean	SD	
Age	42.19	15.45	43.98	16.83	42.93	15.98	0.574

Table 3 compares the age of study participants in relation to their reported Quality of Life (QOL). Participants who reported a satisfactory QOL had a mean age of 42.19 years (SD = 15.45), while those with an unsatisfactory QOL had a slightly higher mean age of 43.98 years (SD = 16.83). The overall mean age of the study population was 42.93 years (SD = 15.98). The p-value of 0.574 indicates that the difference in age between the two QOL groups is not statistically significant, suggesting that age did not have a meaningful impact on the perceived quality of life among the participants in this study.

Table 4: Comparison of PTA with Quality of Life (QOL)

	QOL							
	Yes		**No**		**Total**		**Z value**	**p value**
	Mean	SD	Mean	SD	Mean	SD		
PTA	72	22	69	24	71	23	-0.714	0.475

Table 4 presents a comparison of Pure Tone Audiometry (PTA) thresholds between participants with good and poor QOL. Participants with a satisfactory QOL had a mean PTA threshold of 72 dB (SD = 22), while those with a poor QOL had a mean of 69 dB (SD = 24). The overall mean PTA across all participants was 71 dB (SD = 23). The Z value of -0.714 and the p-value of 0.475 indicate that the difference in hearing thresholds between the two QOL groups is not statistically significant. This suggests that hearing impairment, as measured by PTA, may not have a substantial direct impact on the perceived quality of life among the study participants.

Table 5: Comparison of Variables with Respect to Quality of Life (QOL)

Variable	**Subcategory**	**QOL - Yes(n=62aa)**	**QOL - No(n=44)**	**Total(n=106)**
Age Interval	<18 years	3 (4.8%)	2 (4.5%)	5 (4.7%)
	18–35 years	17 (27.4%)	13 (29.5%)	30 (28.3%)
	36–50 years	27 (43.5%)	12 (27.3%)	39 (36.8%)
	51–65 years	10 (16.1%)	15 (34.1%)	25 (23.6%)

	>65 years	5 (8.1%)	2 (4.5%)	7 (6.6%)
Gender	Female	26 (41.9%)	22 (50.0%)	48 (45.3%)
	Male	36 (58.1%)	22 (50.0%)	58 (54.7%)
USHL Duration	1 month	39 (62.9%)	15 (34.1%)	54 (50.9%)
	1–12 months	9 (14.5%)	20 (45.5%)	29 (27.4%)
	>1–5 years	14 (22.6%)	9 (20.5%)	23 (21.7%)
Laterality	Left	33 (53.2%)	23 (52.3%)	56 (52.8%)
	Right	29 (46.8%)	21 (47.7%)	50 (47.2%)
Associated Symptoms	Headache	5 (8.1%)	2 (4.5%)	7 (6.6%)
	No symptoms	14 (22.6%)	11 (25.0%)	25 (23.6%)
	Tinnitus	38 (61.3%)	24 (54.5%)	62 (58.5%)
	Vertigo	5 (8.1%)	7 (15.9%)	12 (11.3%)
Comorbidity	Diabetes	3 (4.8%)	5 (11.4%)	8 (7.5%)
	Dyslipidemia	6 (9.7%)	2 (4.5%)	8 (7.5%)
	Hypertension	6 (9.7%)	7 (15.9%)	13 (12.3%)
	Hypothyroidism	4 (6.5%)	6 (13.6%)	10 (9.4%)
	No comorbidities	43 (69.4%)	24 (54.5%)	67 (63.2%)
TM Status	Intact	62 (100.0%)	44(100.0%)	106 (100.0%)
H/O Abuse	No trauma	50 (80.6%)	31 (70.5%)	81 (76.4%)
	Noise trauma	6 (9.7%)	8 (18.2%)	14 (13.2%)
	Fracture trauma	6 (9.7%)	5 (11.4%)	11 (10.4%)
Vestibular Symptoms	Present	6 (9.7%)	8 (18.2%)	14 (13.2%)
	Absent	56 (90.3%)	36 (81.8%)	92 (86.8%)
Tympanometry	B/L Type A	62 (100.0%)	44 (100.0%)	106 (100.0%)
BERA	IWL-Increased	2 (3.2%)	0 (0.0%)	2 (1.9%)
	WNL–IWL	60 (96.8%)	44 (100.0%)	104 (98.1%)
MRI	Hyperintense mass	2 (3.2%)	0 (0.0%)	2 (1.9%)
	No mass	60 (96.8%)	44 (100.0%)	104 (98.1%)
Etiology	Acoustic neuroma	2 (3.2%)	0 (0.0%)	2 (1.9%)
	Congenital	5 (8.1%)	5 (11.4%)	10 (9.4%)
	Idiopathic	24(38.7%)	18 (40.9%)	42 (39.6%)
	Meniere's disease	7 (11.3%)	9 (20.5%)	16 (15.1%)
	Metabolic	1 (1.6%)	3 (6.8%)	4 (3.8%)
	SSNHL	16 (25.8%)	7 (15.9%)	23 (21.7%)
	Traumatic	7 (11.3%)	2 (4.5%)	9 (8.5%)

Among age intervals, most patients were between 36–50 years, followed by 18–35 years, though age differences were not statistically significant (p=0.207). Gender distribution showed a slight male predominance overall, but the difference between groups was not significant (p=0.411). A significant association was found in the duration of unilateral sensorineural hearing loss (USHL), with a higher proportion of those with QOL reporting hearing loss for 1 month (62.9%) compared to those without QOL (34.1%) (p=0.001), suggesting early-stage hearing loss might relate to better-perceived QOL.

Laterality (left vs. right ear) showed no difference (p=0.923). Among associated symptoms, tinnitus was the most common in both groups, though no significant associations were observed across symptoms (p=0.543). The presence of comorbidities like diabetes, hypertension, hypothyroidism, and dyslipidemia showed no significant differences, although a larger proportion of those with QOL had no comorbidities. All patients had an intact tympanic membrane (TM) and bilateral Type A tympanometry. A history of abuse or trauma, vestibular symptoms, BERA findings, and MRI results did not significantly differ between groups. Similarly, the etiologies of hearing loss, such as idiopathic causes, Meniere's disease, SSNHL, trauma, and congenital origins, showed no statistically significant differences (p=0.271), though idiopathic causes remained the most common in both groups.

Table 6: Comparison of Biochemical Parameters with Quality of Life (QOL).

	QOL						**p value**
	Yes			**No**			
	Mean	**SD**	**Valid N**	**Mean**	**SD**	**Valid N**	
TFT	6.35	0.35	2	6.22	.27	4	0.800
RBS	205.60	29.27	5	193.60	25.00	5	0.548
LIPID	309	12.73	7	326.50	16.26	2	0.222
CBC	9.67	1.53	3	7.25	3.77	4	0.629

Applied Mann Whitney U test

Table 6 compares various biochemical parameters between participants with good and poor Quality of Life (QOL) using the Mann–Whitney U test. For thyroid function test (TFT), the mean TSH level was 6.35 (SD = 0.35) in participants with good QOL and 6.22 (SD = 0.27) in those with poor QOL, with a p-value of 0.800, indicating no significant difference. In terms of random blood sugar (RBS), the mean was 205.60 mg/dL in the good QOL group and 193.60 mg/dL in the poor QOL group (p = 0.548), again showing no statistically significant difference. Lipid (triglyceride) levels were slightly lower in the good QOL group (309 mg/dL) compared to the poor QOL group (326.50 mg/dL), but the difference was not significant (p = 0.222). For hemoglobin (CBC-Hb), the good QOL group had a higher mean (9.67 g/dL) compared to the poor QOL group (7.25 g/dL), but with a p-value of 0.629, the difference was not statistically significant.

3. DISCUSSION

The present study aimed to investigate the diverse etiologies and the impact of USNHLon QOL, incorporating both clinical and biochemical parameters.Out of 106 participants, 58.5% (62 individuals) reported a satisfactory quality of life, while 41.5% (44 individuals) experienced an unsatisfactory quality of life. This indicates that although a majority perceived their quality of life positively, a significant proportion still faced challenges affecting their well-being.

This study highlights that a majority of patients with USNHL reported a satisfactory quality of life (58.5%). Idiopathic causes were the most common etiology, followed by sudden sensorineural hearing loss (SSNHL) and Meniere's disease. Tinnitus was the most frequently associated symptom.

There was no significant association between quality of life and factors such as age, gender, PTA threshold, laterality, comorbidities, or biochemical parameters. However, a shorter duration of hearing loss was significantly associated with a bad quality of life (p = 0.001), emphasizing the impact of early-stage intervention.

The present study found no significant difference in PTA thresholds between participants with good and poor QOL (mean PTA: 72 dB vs. 69 dB, $p = 0.475$), suggesting that hearing severity alone may not directly impact perceived quality of life. This aligns with previous studies by **Dillon et al. [8]**and **Lieuet al.[9]**, which reported that individuals with USNHL often adapt through the unaffected ear and may not perceive significant limitations despite measurable hearing loss. These findings highlight the role of non-audiometric factors in influencing QOL and the need for a more holistic approach to assessment.

In the present study, most patients were aged between 36–50 years, followed by the 18–35 years group; however, age-related differences were not statistically significant (p = 0.207). Gender distribution showed a slight male predominance, but without

significant group differences (p = 0.411). A significant association was observed in the duration of USNHL, with a higher proportion of participants reporting hearing loss for only 1 month among those with bad QOL (62.9% vs. 34.1%; p = 0.001), indicating that early-stage hearing loss may be associated with a more unfavourable perception of QOL.

No significant difference was found with respect to laterality (p = 0.923), and tinnitus remained the most commonly reported symptom across both groups, though without a significant association (p = 0.543). Comorbidities such as diabetes, hypertension, hypothyroidism, and dyslipidemia were more frequently absent among those with better QOL, but this was not statistically significant. Tympanic membranes were intact and tympanometry was Type A bilaterally in all participants. There were no significant group differences in history of trauma or abuse, vestibular symptoms, BERA findings, or MRI results.

Idiopathic causes were the most common etiology, consistent with previous findings **by Snappet al.[10] (2020),** who identified idiopathic sudden sensorineural hearing loss (ISSNHL) as a leading cause of USNHL. The significant link between shorter duration of hearing loss and better QOL supports the idea that early-stage USNHL may be associated with fewer adaptive challenges and lower psychosocial burden, as also noted by **Härkönnen et al. [11](2017),** who reported that chronic hearing loss is associated with more persistent psychological distress.

In this study, biochemical parameters were compared between participants with good and poor quality of life (QOL) using the Mann–Whitney U test. Thyroid function test (TSH) levels showed no significant difference between the groups (mean TSH: 6.35 vs. 6.22; $p = 0.800$). Similarly, random blood sugar (RBS) levels were not significantly different (205.60 mg/dL vs. 193.60 mg/dL; $p = 0.548$). Triglyceride levels were slightly lower in the good QOL group (309 mg/dL) than in the poor QOL group (326.50 mg/dL), but this difference was not statistically significant ($p = 0.222$). Hemoglobin levels were higher in the good QOL group (9.67 g/dL vs. 7.25 g/dL), though again, the difference lacked statistical significance ($p = 0.629$). These findings suggest that systemic metabolic health, as assessed by these parameters, may not have a strong direct association with perceived QOL. This aligns with observations by **Ronner et al.[12] (2020),** who reported that metabolic profiles in children with SNHL did not significantly impact QOL outcomes.

Tinnitus was the most commonly reported symptom across both QOL groups, consistent with **Carlsson et al. [13](2011),** who described tinnitus as a frequent and distressing complaint among SNHL patients. However, no significant association was observed between the presence of tinnitus and QOL in this study ($p = 0.543$), possibly reflecting variability in coping mechanisms and individual psychological resilience. Other symptoms, including vestibular disturbances, as well as imaging findings such as BERA and MRI results, also did not differ significantly between QOL groups. These results support the perspective of **Griffin et al. [14](2019)**, who emphasized the role of emotional and cognitive adaptation over objective clinical findings in determining patient-perceived outcomes.

Demographic factors such as age and gender did not significantly influence QOL in this cohort. This finding is consistent with **Rohlfs et al. [15] (2017),** who noted that demographic variables were generally less predictive of QOL in USNHL compared to clinical and psychosocial parameters. Collectively, the data suggest that perceived QOL in USNHL may be shaped more by the subjective experience and psychological response to the condition than by objective clinical or biochemical markers.

4. CONCLUSION

Unilateral Sensorineural Hearing Loss (USNHL) poses a clinical and psychosocial challenge due to its varied causes and significant impact on quality of life.identified idiopathic cases as the most common, followed by sudden sensorineural hearing loss, Meniere's disease, and congenital causes. Tinnitus was the most frequent symptom, often associated with vertigo, suggesting vestibular involvement. Despite comprehensive evaluations, many cases remained idiopathic. While USNHL negatively affected quality of life, especially with recent onset, no significant correlation was found between age or hearing loss severity and quality of life scores. The study emphasizes the need for early diagnosis, multidisciplinary management, and public awareness to reduce disability and improve outcomes.

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REFERENCES

[1] Deafness and hearing loss. 2020. https://www.who.int/news-room/fact-sheets/detail/deafness-and-hearing-loss

[2] Varshney S. Deafness in India. Indian Journal of Otology . 2016;22(2):p. 73

[3] Tyagi AK, Gupta K, Kumar A, et al. Rare Causes of Unilateral Sensorineural Hearing Loss in Adults: Our Experience. *Indian J Otolaryngol Head Neck Surg*. 2020;72(4):428-436.

[4] Goman AM, Lin FR. Prevalence of hearing loss by severity in the United States. American journal of public health. 2016 Oct;106(10):1820-2.

[5] Kalmanson O, Drohosky J, Greaver L, et al. Unilateral Sensorineural Hearing Loss in Children: Natural History and Clinical Characteristics. *Laryngoscope*. Published online May 6, 2025.

[6] Olivier N, Shepherd DA, Smith L, et al. Etiology, Comorbidities, and Health Service Use in a Clinical Cohort of Children With Hearing Loss. *Ear Hear*. 2022;43(6):1836-1844.

[7] Motala A, Johnsrude IS, Herrmann B. A Longitudinal Framework to Describe the Relation Between Age-Related Hearing Loss and Social Isolation. *Trends Hear*. 2024;28:23312165241236041.

[8] Dillon MT, Buss E, Rooth MA, King ER, Deres EJ, Buchman CA, Pillsbury HC, Brown KD. Effect of cochlear implantation on quality of life in adults with unilateral hearing loss. Audiology and Neurotology. 2018 Mar 13;22(4-5):259-71.

[9] Lieu JE. Children with unilateral hearing loss. InSeminars in Hearing 2010 Nov (Vol. 31, No. 04, pp. 275-289). © Thieme Medical Publishers.

[10] Snapp HA, Ausili SA. Hearing with One Ear: Consequences and Treatments for Profound Unilateral Hearing Loss. *Journal of Clinical Medicine*. 2020; 9(4):1010.

[11] Härkönen K, Kivekäs I, Rautiainen M, Kotti V, Vasama JP. Quality of life and hearing eight years after sudden sensorineural hearing loss. The Laryngoscope. 2017 Apr;127(4):927-31.

[12] Ronner EA, Benchetrit L, Levesque P, Basonbul RA, Cohen MS. Quality of Life in Children with Sensorineural Hearing Loss. *Otolaryngology–Head and Neck Surgery*. 2019;162(1):129-136

[13] Carlsson PI, Hall M, Lind KJ, Danermark B. Quality of life, psychosocial consequences, and audiological rehabilitation after sudden sensorineural hearing loss. International Journal of Audiology. 2011 Feb 1;50(2):139-44.

[14] Griffin AM, Poissant SF, Freyman RL. Speech-in-noise and quality-of-life measures in school-aged children with normal hearing and with unilateral hearing loss. Ear Hear. 2019 Jul-Aug;40(4):887-904.

[15] Rohlfs AK, Friedhoff J, Bohnert A, Breitfuss A, Hess M, Müller F, Strauch A, Röhrs M, Wiesner T. Unilateral hearing loss in children: a retrospective study and a review of the current literature. European journal of pediatrics. 2017 Apr; 176:475-86.