

# Sensoneural hearing loss: features of patients



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Permanent unilateral and bilateral assymetrical sensorineural hearing loss:  
Clinical, vestibular, audiological and radiological evaluation.

## Abstract

The aim of this study was to evaluate the clinical, vestibular, audiological and radiological features of patients with permanent unilateral and assymetrical sensoneural hearing loss (SNHL).

Material and methods: Twenty eight patients with either permanent unilateral and asymmetrical bilateral SNHL, diagnosed by means of pure tone audiometry(PTA) have been submitted to clinical, vestibular, audiological and radiological evaluation.

Results: Total twenty eight patients with male : female ratio of 2. 11 were analysed. 22 (78. 57%)patients had unilateral and 6(21. 43%)patients had bilateral asymmetrical SNHL. Right : left ratio in cases of unilateral SNHL was 0. 83: 1. Both tinnitus and vertigo was present in 12(42. 95%)patients and absent in 10 (35. 8%)patients. On otoscopy tympanic membrane was intact in all cases. PTA showed profound loss in majority of cases. Tone decay was done in 11 patients and was normal in all cases. Cold calorie was done in 27 patients and was absent in 7(25. 9%)patients , hypoactive in 8(29. 6%)patients. MRI study was done in 9 patients. Out of 9, 7 were normal and rest two showed positive findings.

Conclusion: Proper clinical, vestibular and audiological work up is important before radiological investigation is sought to increase diagnostic yield and cost effectiveness in unilateral, bilateral (asymmetrical)SNHL.

## INTRODUCTION

Although a commonly encountered diagnosis by otolaryngologist, unilateral SNHL represents a difficult clinical entity for the specialist. Whereas the diagnosis is easily obtained by PTA, diagnosis of cause and treatment represents the complexity of this clinical situation. Further complicating work up is the evergrowing cost for laboratory and radiological studies(1). Reiss M (1994) carried out study for differential diagnosis of unilateral hearing loss(2). Hendrix RA(1990) carried out study on asymmetrical sensoneural hearing loss.(3). Asymmetrical hearing loss is the difference of more than 10 db averaged over the frequencies 0.5, 1, 2 and 4Khz or 20 db or more at any single frequency(4). A recent study has suggested a rule 3000 where in asymmetry of 15 db or more at 3000Hz require a MRI. If less than 15 db, a biannual audiometric follow -up is sufficient(13). In present study, we present clinical, vestibular , audiological and radiological features of patients with either permanent unilateral SNHL or asymmetrical hearing loss.

## MATERIAL AND METHODS

This prospective study was conducted in the department of Otorhinolaryngology, government medical college, Srinagar, Kashmir on 28 patients, consisting both pediatric and adult patients from December 2013 to May 2014.

After taking history about hearing loss and associated symptoms, otoscopy and PTA, patients were subjected to audiological and vestibular evaluation. Radiological investigation(MRI) was done in selected group of patients

because of financial and other reasons. Sex distribution, laterality, audiological, vestibular and radiological findings are presented in tables 1-6.

## RESULTS

A total of 28 patients were included in present study. Out of 28 patients, 19 were males and 9 were females with male to female ratio of 2.11 (table 1). Involvement of left ear was more common than right and 6 patients (21.42%) had bilateral asymmetrical loss (table 2). Vertigo and tinnitus was associated symptoms in 12 patients (42.95%) and 10 patients (35.8%) presented with hearing without associated symptoms (table 3). Tone decay test was normal in all tested patients (table 4). Cold calorie test was hypoactive in 8 patients (29.6%) and absent in 7 patients (25.9%) (table 5). Radiological findings were normal in 7 out of 9 patients (table 6).

## DISCUSSION

We describe 28 patients of unilateral and asymmetrical SNHL which were clinically, audiological and radiologically evaluated. Male preponderance was observed in the present study which is consistent to other study (5). In studies by Cadoni G et al (2005) and Stefano Berrettini (2013), both have female preponderance which is in contrast to present study (6, 7). In present study, left ear was more affected as compared to right which is consistent to study done by Stefano Berrettini (2013) (7).

In our study tinnitus is present in 14 patients (50.09%) and vertigo is present in 16 patients (59.3%). Study done by Stefano Berrettini showed tinnitus was present in 87% and vertigo in 44% cases (7). In present study, Tone decay

test(TDT) was done in 11 patients. TDT was not done in patients having profound SNHL. In all patients in which TDT was done, results were normal. P. L. Bhatia (1969) et al in his study used TDT for diagnosis of retro cochlear pathology(8). It helps in diagnosing neural lesions quite accurately(9).

In our study vestibular function test (cold calorie test) was done in all patients except one. CCT was absent(no response) in 7 patients(25.9%) and hypoactive in 8 patients(29.6%). Stefano Berrettini et al used calorie stimulation test in his study(7). Although the findings of decreased vestibular function on calorie testing in ipsilateral side to a SNHL historically has been useful in suggesting the diagnosis of vestibular schwannoma. But at present, it is not sensitive enough to be helpful diagnostically for vestibular schwannoma because a small inferior vestibular nerve schwannoma might not cause an abnormal calorie response(10). Hypoactivity of the affected side is seen in Ménière's disease(11).

In present study, patients having hypoactive calorie test or absent calorie test or in whom tone decay test could not be done due to profound hearing loss were subjected to radiological investigation(MRI). One patient on MRI showed micro haemorrhages in left peritrigonal area and other patient on MRI showed vestibular schwannoma. MRI is now the recommended investigation for diagnosis of retrocochlear pathology.(2, 12). MRI scanning with Gadolinium will identify virtually all tumours and was considered to be gold standard(14). Recently T2-weighted fast spin echo MRI has been found to be sensitive and less expensive than gadolinium enhanced standard MRI(15).

## CONCLUSION

Clinical , audiological and vestibular testing is important in diagnostic workup of unilateral and asymmetric hearing before radiological investigation is done to decrease economic burden and to increase diagnostic yield from definite radiological investigations.

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SEX NO. OF PATIENTS %

		67.
Male	19	85%

Female	9	32.
		15%

Table1: Sex distribution of patients (n= 28)

Laterality	No. of Patients	%
Right	10	35.7%
Left	12	42.8%
Bilateral (Asymmetrical)	6	21.5%

Table 2: Laterality of involved ear of patients (n= 28)

Associated symptoms	NO. OF PATIENTS	%
vertigo	4	14.2%
Tinnitus	2	7.1%
Both Present	12	42.8%



Both Absent	10	35. 8%
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Table 3: Associated symptoms with hearing loss (n= 28)

RESULT	NO. OF PATIENTS	%
Normal	11	100%
Abnormal	0	0%

Table 4: Tone decay test of patients (n= 11)

RESPONSE	NO. OF PATIENTS	%
Normal	12	44. 5%
Absent(no response)	7	25. 9%
Hypoactive	8	29. 6%

Table 5: Cold Calorie test of patients (n= 27)

FINDINGS	NO. OF PATIENTS (%)
Normal	7(77. 8)%

Positive	Microhaemorrhage	1(11.1)%
Vestibular Schwannoma		1(11.1)%

Table 6: Radiological (MRI) findings of patients (n= 9)