www.jmscr.igmpublication.org
Index Copernicus Value: 79.54
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v7i6.149

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Evaluation of Hearing Loss Pattern in Patients of Vestibular Schwannoma

Authors
Dr V.P. Narve[1], Dr Vinay Gangwani[2], Dr Varsha Tripathi[3*], Dr Deepak Parmar[4]
[1]Professor and Head Department of ENT Jaya Arogya Hospital, Gwalior
[2,3,4]Post Graduate Student, Department of ENT Jaya Arogya Hospital, Gwalior
*Corresponding Author
Dr Varsha Tripathi
Post Graduate Student, Department of ENT Jaya Arogya Hospital, Gwalior, India

Abstract
Aims and Objective: *Assessment of HEARING LOSS in patients of vestibular schwannoma.*
Methodology: *This is the retrospective study done in tertiary care hospital of 37 diagnosed patients of vestibular schwannoma between January 2016 to november 2018.*
Results: *Most common type of hearing loss on the affected side in 10 patients is Moderate sensoneural hearing loss (27.02%), 9 patients (24.32%) had moderately severe hearing loss , 9 patients (24.32%) had profound hearing loss, 6 patients had (16.21%) mild hearing loss, 2 patients had severe sensoneural hearing loss (5.40%), 1 patient had normal hearing (2.70%). All the patients had high frequency hearing loss. Average hearing loss 51.95±16.15 db*
Conclusion: *Asymmetric sensorineural hearing loss is the most common presentation in all patients of vestibular schwannoma usually affecting high frequencies. In this sample, magnetic resonance imaging was the modality of choice for definitive diagnosis.*

Introduction

- Acoustic neuroma is also known as
  Vestibular schwannoma
  Neurilemmoma
  Eighth nerve tumour
- *Its constitute 80% of all cerebellopontine angle tumour and 10% of all the brain tumour* . Unilateral vestibular schwannoma (VS) is a benign tumour arising from abnormally proliferative schwann cells (Obersteiner-Redlich zone), which envelope the lateral portion of the vestibular nerve in the internal acoustic meatus. It is benign, encapsulated, extremly slow growing tumour of 8th nerve. Affecting fourth to sixth decade. Both sex are equally affected. The aetiology of VS is not known. Recent advances in molecular biology indicate that a defect of chromosome 22q may be responsible for the development of both the unilateral sporadic VS and the bilateral VS in neurofibromatosis type 2.
- 80 - 90% of CPA tumors
- 94% Sporadic (unilateral), 6% Neurofibromatosis type 2 (bilateral).
- Histopathological examination of VS reveals two morphological tissue patterns:-

Antoni A pattern

There are closely packed cells with small spindle-shaped and densely stained nuclei.

A whirled appearance of Antoni type a cells is called a Vero cay body

Antoni B Pattern

Antoni B pattern in which there is a looser cellular aggregation of vacuolated pleomorphic cells.

- In any particular VS, one type of cellular pattern may predominate or both types can be completely admixed.
- Jacklar system (according to size.)

Intrameatal Tumour	Extrameatal size	mm
Grade 1	Small	1-10
Grade 2	Medium	11-20
Grade 3	Moderately large	21-30
Grade 4	Large	31-40
Grade 5	Giant	>40

Methodology

This is the prospective and retrospective study done in tertiary care hospital of 37 diagnosed patients of vestibular schwannoma between January 2016 to November 2018.

All the diagnosed patients of vestibular schwannoma with History of unilateral hearing loss.

History Taking and Examination

- All the patients were being underwent complete history taking and clinical examination. Pure tone audiometry was performed by a calibrated audiometer in a sound-proof room.
- The hearing of the patient was assessed by pure tone audiogram (type and degree of hearing loss recorded). Hearing loss up to 25 dB is considered normal, 26-40 dB mild, 41-55 dB moderate, 56-70 dB moderately severe, 71-90 dB severe, and above 90 dB as profound. Categorical data incidence was then analysed with respect to age of patient, sex, and degree of impaired hearing.

Results

1. Age distribution of patients

In our study maximum number of patients were from age group 21-40 years (43.24%), followed by 41-60 years (40.54%).

Table no.1: Age distribution of patients

Age Group (in years)	No. Of Patients	Percentage
0 – 20	4	10.81
21-40	16	43.24
41- 60	15	40.54
60	2	5.40

2. Sex

The total number of male and female patients in our study were 19 and 18 respectively.

Table no. 2: Sex ratio of the patients

Sex	No. Of Patients	Percentage
MALE	19	51.35
FEMALE	18	48.64

3. Degree of hearing loss

In our study maximum patients showed moderate hearing loss on PTA.

Average hearing loss in our study was 51.95± 16.15 dB.

Table no. 3: Degree of hearing loss.

Degree Of Hearing Loss	No. Of Patients	Percentage
NORMAL HEARING (0 TO 25 dB)	1	2.70
MILD (26 – 40 dB)	6	16.21
MODERATE (41- 55 dB)	10	27.02
MODERATELY SEVERE (56 – 70 dB)	9	24.32
SEVERE(71 – 90 dB)	2	5.40
PROFOUND(>90 dB)	9	24.32

Discussion

- Vestibulo-cochlear nerve neoplasm have been recognized as a distinct clinical and pathological entity for atleast 200 years, and account for approximately 90% of all conditions affecting the cp angle. The most appropriate term for these tumour is vestibular schwannoma[1,2] .
- The first observation of a tumor of the acoustic nerve was made during an autopsy in 1777 by Eduard Sandifort, Professor of Anatomy at Leiden University[3]. As the name implies, schwannomas are histologically derived from Schwann cells. Small schwannomas consist of elongated, palisade cells, whereas larger tumors also exhibit central cystic degeneration, possibly due to deficient vascularization.
- The etiology of vestibular schwannomas is unknown. Cushing (1917) and Revilla (1948) believed trauma was a plausible explanation, as some observations apparently associated occipital trauma with tumors of the cerebellopontine angle (4,5).
- In the vast majority of cases, the upper (vestibular) branch of the vestibulocochlear nerve is predisposed to the development of vestibular schwannomas and, in most cases, the tumor arises from the back of the internal auditory canal. Rarely, schwannomas may originate from the cochlear branch of CN VIII (6,7, 8).
- The main symptom is hearing loss, often associated with tinnitus, due to compression of the cochlear nerve and disturbances in cochlear vascularization. This vascular mechanism explains the possibility of sudden, atypical, fluctuant hearing loss (9), often presenting with audiometry features suggesting peripheral involvement.
- Other signs and symptoms may also be present, such as vertigo, dizziness, headache, hypoesthesia, and palsies. Clinical presentation is not always proportional to tumor size.
- Classically, vestibular schwannomas are most often diagnosed around the fifth decade of life. In our study maximum number of patients were from age group 21-40 years (43.24%), followed by 41-60 years (40.54%), which is consistent with the international literature.
- Most authors report a clear female preponderance. In our study we have got almost equal distribution.
- In our study mean pure tone threshold was 51.95± 16.15 dB. In a broad review by several authors (Brackmann, Sterkers, Portmann), the mean pure-tone threshold at 500, 1000, 2000 was 72 dB, not taking into account disease progression.
- MRI is undoubtedly the imaging modality of choice when cerebellopontine angle disease is suspected. Gadolinium contrast-enhanced MRI has nearly 100% reliability, even for small tumors.

Conclusion

- In nearly all cases, asymmetric sensorineural hearing loss is the first symptom of vestibular schwannoma.
- In this sample, magnetic resonance imaging was the modality of choice for definitive diagnosis.
- Most common age group to be affected lies between 20 to 60 years.
- Hearing loss lies in modertae to moderately severe range.

References

1. Woellner RC, Schuknecht HF. Hearing loss from lesions of the cochlear nerve: an experimental and clinical study. Trans Am Acad Ophthalmol Otolaryngol. 1955;59 (2):147- 9.

2. Stewart TJ, Liland J, Schuknecht HF. Ocult schwannomas of the vestibular nerve . Arch. Otoloryngol. 1975;110(2):91- 95.
3. Sandifort E. Observationes anatomicae-pathologicae, vd Eryck P, Vygh D, Lugduni Batavorum 1777.
4. Cushing H. Tumors of the nervus acusticus and the syndrome of cerebellopontine angle, Philadelphia, Saunders, edit., 1917.
5. Revilla AG (1948), apud Dykstra PC (1964)
6. Dykstra PC. The pathology of acoustic neuromas. In: House WF. Monograph-Transtemporal Bone Microsurgical Removal of Acoustic Neuromas. Arch Otolaryngol. 1964;80:751-2.
7. House WF. Transtemporal bone microsurgical removal of acoustic neuromas: report of cases. Arch. Otolaryngol. 1964;80:617-667.
8. Pulec JL, House W, Britton Jr BH, Hitselberger WE. - A system of management of acoustic neuroma based in 364 cases. Trans Am Acad Ophtalmol. Otolaryngol.; 1971;75:48- 55.