

Original Research Article

Clinical and pathophysiological study of patients with vertigo at SAIMS, Indore

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ABSTRACT

Background: This was a prospective, descriptive study performed by collecting and analyzing the results of vestibular exams, evoked myogenic potential tests, pure tone audiometry test and impedance test performed in the Otorhinolaryngology Department of Sri Aurobindo Institute of Medical Sciences, Indore.

Methods: This was a prospective, descriptive study performed by collecting and analyzing the results of vestibular exams, evoked myogenic potential tests, pure tone audiometry test and impedance test performed in the Otorhinolaryngology Department of Sri Aurobindo Institute of Medical Sciences, Indore.

Results: In age group of 20 to 60, maximum number of patients were in group of 31-40 (16), followed by 51-60 (15), followed by 20-30 (24.) Maximum positive seen in Romberg (07), followed by nystagmus (06), followed by Dix-Hallpike (06). The patients in our study (30 out of 50) were suffering from hypertension. Two patients were of Meniere's disease and rest 16 were of SNHL, 08 were of SNHL and BPPV combined. The rest of the cases were of mixed hearing loss and other central hearing loss causes will have be ruled out.

Conclusions: The main aim of study is to study clinicopathological aspects in patients with vertigo. We also studied incidence of SNHL in our study. It has been established by this study that hypertension is one the major causes of vertigo in patients whereas VEMP has not proven to be very beneficial in our study to see peripheral vertigo patients. Most of the patients with BPPV also had a normal cVEMP which showed that it was not a very reliable instrument in BPPV.

Keywords: Clinical, Vertigo, Pathophysiological

INTRODUCTION

Vertigo and balance problems are commonly encountered in clinical practice. Obtaining a clear and accurate history of the problem is often significant for making the correct diagnosis. In the first instance, vertigo, the illusion of rotational motion, must be clearly distinguished from other symptoms, such as light headedness, in the patient who presents with the complaint of 'dizziness'.¹

Vertigo, defined as an erroneous sense of motion and unsteadiness is a relatively common condition, yet

definitions vary and management guidelines are often contradictory.²

The epidemiological data indicate that among all patients who come to General Practitioners those who suffer from vertigo and balance disorders account for 5-7%. These people are also estimated at 10-12% of the otolaryngologists' patients. Vertigo may be present in patients of all ages. However, becomes more prevalent complaint with increasing age of patient.³ It is often difficult for a physician to elucidate the quality of dizziness a patient is experiencing and decide how to proceed with medical management.

It is also useful to find out if the vertigo comes on spontaneously (the syndrome of spontaneous vertigo) or if it is provoked by some other stimulus (the syndrome of provoked vertigo), such as a change in head position or a loud sound. Vertigo, an illusion of rotational motion, is due to asymmetry in vestibular nucleus activity.⁴

Acute unilateral vestibular pathology produces temporary asymmetry in vestibular nucleus activity and, therefore, temporary vertigo with associated nausea, vomiting, and nystagmus. Chronic unilateral/bilateral vestibular pathology does not result in vertigo or nystagmus, but may produce chronic vestibular insufficiency, in which there is postural imbalance and oscillopsia during head movements. Patient may also present with the complaint of feeling unsteady (the syndrome of postural imbalance), although most patients with postural imbalance have no associated vertigo.

The main objective of study is to study clinico-pathological aspects in patients with vertigo. We also studied incidence of SNHL in our study. It has been established by this study that hypertension is one the major causes of vertigo in patients whereas VEMP has not proven to be very beneficial in our study to see peripheral vertigo patients. Most of the patients with BPPV also had a normal cVEMP which showed that it was not a very reliable instrument in BPPV.

METHODS

Study design

Observational study.

Study place

Sri Aurobindo Institute of Medical Sciences, Indore during June 2017 to June 2018.

Selection criteria and procedure

This was a prospective, descriptive study performed by collecting and analyzing the results of vestibular exams, evoked myogenic potential tests, pure tone audiometry test and impedance test performed in the Otorhinolaryngology Department of Sri Aurobindo Institute of Medical Sciences, Indore during June 2017 to June 2018 and study is approved by Ethical Committee of the Institute.

Patients with history of vertigo were clinically assessed as per the performa. Complete ENT examination was done along with clinical test such as Dix-Hallpike test, fistula test, nystagmus, Romberg test. Patients were further subjected to special test such as pure tone audiometry, impedance audiometry, vestibular evoked myogenic potential (VEMP), and electrocochleography (ECoChG).



Figure 1: Dix- Hallpike test.



Figure 2: VEMP test.

Prior to VEMP and ECoChG, patient were instructed to suspend the use of medicine for the treatment of dizziness, tranquilizers, and muscle relaxants for 72 hours prior to the examination (vital medicine such as that for the treatment of heart disease or blood pressure control was not suspended) and to avoid food or other substances that stimulate the vestibular system (i.e., substances high in caffeine or stimulants, such as chocolate, cigarettes, soft drinks, alcoholic beverages, or tea) for 24 hours prior to the examination.

The electrodes for VEMP were positioned on the upper third of the sternocleidomastoid muscle ipsilateral to the side of sound stimulation (positive polarity), on the upper portion of the sternum (negative polarity), and on the upper third of the sternocleidomastoid muscle contralateral to the sound stimulation (ground electrode). During the presentation of the sound stimulus, the patient was asked to perform a 30° flexion of the head to the trunk to maintain the sternocleidomastoid muscles in a contracted state during registration, thus obtaining muscle activation between the sides. The response parameters were the absolute latencies of p13 and n23 in ms, and values greater than the mean plus 2 standard deviations (2SD) were interpreted as altered responses.

Electrocochleography measure action potential (AP) which is compound action potential of auditory nerve and summing potential (SP) which is response of cochlea to sound stimulation. Ratio of SP/AP more than 0.5 is used to diagnose Meniere's disease.

Inclusion criteria

- Study included patients with vertigo between 20- 60 years of age, and the availability of the results of pure tone audiometry, impedance audiometry, VEMP and ECoChG.

Exclusion criteria

- Patients with head injury and /or undergone neurosurgery, cardiac surgery were excluded.
- Patients with immune compromised state such as HIV/AIDS, suffering from chronic infections like TB were excluded.
- Patients suffering from malignancy and receiving chemotherapy/radiotherapy were excluded.
- Patient not willing to undergo the tests.

RESULTS

In age group of 20 to 60, maximum no. of patients were in group of 31-40 (16), followed by 51-60 (15), followed by 20-30 (24).

Maximum positive seen in Romberg (07), followed by nystagmus (06), followed by Dix-Hallpike (06).

Table 1: Age wise distribution.

Age group (in yrs)	Number of patients	Percentage (%)
20-30	12	24
31-40	16	32
41-50	07	14
51-60	15	30
Total	50	100

Table 2: Clinical test (n=50).

Clinical tests	Present/positive	Percentage (%)
Nystagmus	06	12
Fistula test	00	00
Romberg	07	14
Dix-Hallpike	06	12

Figure 3 shows that most of the patients in our study (30 out of 50) were suffering from hypertension. Two patients were of Meniere’s disease and rest 16 were of SNHL, 08 were of SNHL and BPPV combined. The rest of the cases were of mixed hearing loss and other central hearing loss causes will have be ruled out.

Table 3: Vertigo and clinical condition of patients.

Hypertension combined with hearing loss conditions (n=30)	Meniere’s disease (n=2)	Psychological factors (anxiety, stress combined with mixed hearing loss conditions (n=14).	SNHL by PTA (n=16)	BPPV and SNHL combined (n=8)	Unknown causes of vertigo (n=12)
18	02	04	06	05	07
12	00	10	10	03	05

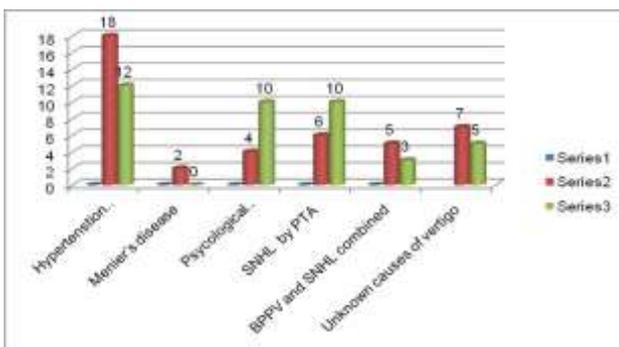


Figure 3: Vertigo and clinical condition of patients.

DISCUSSION

According to Fujita et al the absence of abnormalities in pure tone audiometry and a clinical history of rotating dizziness, vertigo and postural nystagmus, raise the hypothesis of BPPV. Our findings we concluded that vertigo in elderly due to BPPV is due to age itself.⁵

In present study male:female ratio is 1:0.6129. Total number of male patients studied was 19 and that of female patient studied was 31 in present study, most the incidence of SNHL was 16 out of total of 50 patients. In these patients PTA showed hearing impairment of more than 60dBHL, average 68.3dBHL and 69.3 dBHL (male and female respectively in both right and left ear. This shows that in our study females have slightly higher incidence of SNHLs sensorineural descending hearing loss is prevalent in elderly individuals; the threshold is decreased as age progresses. We found this same prevalence of association of vertigo because of hearing loss in all age groups, showing that only BPPV does not alter the features of hearing loss in elderly individuals.

In another study, 97.1% of a sample of elderly individuals with complaints of dizziness had sensorineural hearing loss, and 81.8% of this sample had descending hearing loss. This study also showed that the prevailing vestibular complaint was postural vertigo (BPPV), which was encountered in 61.8% of the sample. Inherent degenerative processes may explain this type of

hearing loss and the prevalence of BPPV in elderly individuals which is one the causes of vertigo. Agoraphobia is defined as anxiety about being in places or situations in which escape might be difficult or help might not be available in the event of a panic attack or panic-like symptoms. Most, but not all, people with panic disorder develop at least some degree of agoraphobia. In extreme cases, an individual with panic disorder and agoraphobia may be completely unable to leave the house. More typically, people with agoraphobia experience some restrictions in what they are able to do but they are able to leave the house, especially if they are accompanied by someone they know. In some cases, agoraphobia may be explained by a psychological mechanism (panic disorders). In others, it can be thought of as functional dizziness.⁶

In 1985 McClure had published the electronystagmographic (ENG) traces of seven subjects who had intense positional vertigo and direction-changing horizontal nystagmus when supine.^{7,8} The fast phase was towards the undermost ear (geotropic). McClure suspected a “viscous plug” in the horizontal canal which was causing a piston effect on the horizontal canal receptor. As discovered by Ewald, an ampullopetal (towards the vestibule) cupula deflection is known to cause the most intense nystagmus and vertigo.⁹

CONCLUSION

The main aim of study is to study clinicopathological aspects in patients with vertigo. We also studied incidence of SNHL in our study. It has been established by this study that hypertension is one the major causes of vertigo in patients whereas VEMP has not proven to be very beneficial in our study to see peripheral vertigo patients. Most of the patients with BPPV also had a normal cVEMP which showed that it was not a very reliable instrument in BPPV.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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