

Original Research Article

Evaluation of peripheral vertigo: an observational vertigo

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ABSTRACT

Background: Vertigo (internal) refers to the perception of self-motion even when there is no actual movement or the perception of distorted self-motion during normal motion of the head. Approximately 6.5% of individuals may encounter peripheral vestibular issues at some stage during their lifetimes.

Methods: All patients attending the outpatient department of ENT and SMCH with the chief complaint of vertigo or dizziness had been subjected to a general physical examination, local examination of the ear, nose, and throat, examination of the vestibular system, postural tests, and cerebellar function tests. Pure Tone Audiometry, VNG (Videonystagmography), and radiological investigations as per requirement.

Results: The study included 38 patients diagnosed with peripheral vertigo throughout the course of one year. Benign Paroxysmal Positional Vertigo (BPPV) was the most common condition (60.5%), followed by Meniere's disease (7.9%) and acute vestibular neuritis (13.2%). Chronic Bilateral vestibulopathy, persistent perceptual postural dizziness (PPPD), and mobile third window phenomenon were less prevalent.

Conclusions: This study concludes that early diagnosis and appropriate treatment can prevent peripheral vertigo, which is more common in the elderly population and compromises their quality of life.

Keywords: BPPV, Meniere's disease, Peripheral vertigo, PPPD, Prevalence of peripheral vertigo, Vestibular neuritis

INTRODUCTION

Vertigo (internal) refers to the perception of self-motion even when there is no actual movement or the perception of distorted self-motion during a regular movement of the head.¹ The symptoms of peripheral vertigo can occur spontaneously or be provoked by a variety of circumstances, depending on the underlying cause of the illness. About 6.5% of people will experience peripheral vestibular problems at some point in their lives.² In the emergency department (ED), peripheral vestibular diseases are typically misdiagnosed or mistreated, with rates reported to be between 74% and 81%.^{3,4} People frequently misdiagnose diseases like vestibular neuritis and benign paroxysmal positional vertigo (BPPV) as

more serious central causes like stroke, and they can also confuse them with one another.³⁻⁵ The management is not optimal and not grounded in evidence.^{4,5} Proper clinical history-taking and bedside examinations can well differentiate between peripheral vertigo and vertigo of central origin. In acute vestibular syndrome, a normal horizontal head impulse test, abnormal skew deviation (vertical ocular misalignment), or direction-changing nystagmus in eccentric gaze were jointly determined to be 100% sensitive and 96% specific for stroke in comparison to early MRI.⁶

There are several reasons why proper diagnosis of peripheral vestibular problems should be taken seriously. A proper clinical evaluation and oculographic

examination can save the time, money, and life of the patients rather than waiting for sophisticated radiological and other imaging studies to rule out the central causes of vertigo.⁶ The Dix-Hallpike test and the other effective canalith repositioning procedure are recommended by systematic studies and clinical guidelines for BPPV, which is the most common peripheral vestibular disorder.⁷ Comprehensive history-taking and clinical examination generally distinguish peripheral vertigo, including conditions like Meniere's disease, vestibular neuritis, and labyrinthitis. In some instances, further investigations may be necessary to aid in the diagnosis. The primary factors contributing to vertigo are vestibular migraine, vertebrobasilar insufficiency, posterior fossa stroke, cerebellopontine angle tumours, multiple sclerosis, and episodic ataxia. These factors are less prevalent compared to peripheral causes. Bedside procedures have the potential to serve as a quick and inexpensive alternative to current treatment methods in a time when both efficiency and cost reduction are of utmost importance.⁶ In study centre, author used the videonystagmography tool for the oculography tests and to help in the early differentiation of central and peripheral vertigo. We have aimed to study the clinical presentations, the role of history taking, clinical neuro-otological tests, laboratory tests in diagnosing peripheral vertigo, and management of the respective cause of peripheral vertigo with the available line of treatment for the same.

METHODS

The study was conducted for a duration of one year, spanning from February 2022 to February 2023, at the ENT Head & Neck department at SMCH. We provided a detailed explanation of the study to all participants and obtained their informed consent. The study protocol received approval from the institutional ethics committee. All patients visiting the outpatient department of ENT (SMCH) with the main complaint of vertigo or dizziness had a comprehensive evaluation, including a general physical examination, a thorough examination of the ear, nose, and throat, an assessment of the vestibular system, postural tests, and tests to evaluate cerebellar function. Pure tone audiometry, VNG (videonystagmography), and radiological investigations as per requirement. All patients were first examined for central vestibular disorders, especially to look for stroke, and for that, we used the HINTS examination system with the other cerebellar signs. Patients with a negative head impulse test, spontaneous direction-changing non-fatigable nystagmus without suppression of visual fixation, and skew deviation were referred to the Department of Medicine, SMCH, for further evaluation of a stroke or posterior fossa lesion. All the patients with a history consistent with peripheral vertigo were evaluated with positional diagnostic manoeuvres for positional vertigo patients. Fukuda's stepping test, modified Romberg test, caloric test, and pure tone audiometry, along with the result of HINTS, were used for the diagnosis of vestibular

neuritis and labyrinthitis. The patients with inconclusive clinical interpretations about the canal involvement of patients with BPPV were further evaluated with videonystagmography. After the final diagnosis of the patients, they were treated with the currently recommended treatment regimen.

RESULTS

A total of 38 patients were included (undiagnosed patients were excluded from the analysis, which was 11 in number) in our study after being diagnosed with a cause of peripheral vertigo during a one-year period from February 2022 to February 2023, with a median age of 52 years (ranging from 18 to 87 years). Out of 38, 23 were male and 15 were female. In our study, 23 patients were diagnosed with BPPV, 03 with Meniere's disease, 05 with acute unilateral vestibular neuritis, 03 with PPPD, 02 with chronic bilateral vestibulopathy, and 02 with the third mobile window phenomenon.

Table 1: Showing the epidemiological distribution of cases.

Name of diseases		No. of cases	Prevalence
BPPV		23	60.5
PC-BPPV		13	34
HC-BPPV	Canalolithiasis	04	10.5
	Cupulolithiasis	03	7.9
AC-BPPV		03	7.9
Acute vestibular neuritis		05	13.2
Meniere's disease		03	7.9
PPPD		03	7.9
Chronic bilateral vestibulopathy		02	5.3
Mobile third window phenomenon		02	5.3

Out of 23 BPPV patients (median age: 46 years, ranging from 18 to 87 years), 14 were male and 09 were female, among which 13 were posterior canal BPPV with only one patient involving the left side, 03 were anterior canal BPPV (both left and right were found equally involved), and 07 were horizontal canal BPPV (on the right side, 03 patients and on the left side, 04 patients were found).

We diagnosed 05 patients with acute vestibular neuritis with a median age of 51 years (42-55 years), among which 03 had pure superior vestibular neuritis and 02 had total vestibular neuritis. We found no patients with pure inferior vestibular neuritis. Out of 5 patients, 3 were male and 2 were female.

Out of 3 patients with Meniere's disease, 2 were unilateral and one was bilateral; all three patients were over 60 years of age.

Out of 2 patients in the third mobile window, both were male; one was diagnosed with a peri-lymphatic fistula on the left side and superior semicircular canal dehiscence on the right side.

Two patients were diagnosed with chronic bilateral vestibulopathy, one female and one male; both were over 70 years of age.

Three patients were diagnosed with persistent perceptual postural dizziness, with a median age of 58 years; two were male and one was female.

DISCUSSION

In India, life expectancy has increased from 56 to 70 years in the last 40 years, indicating a larger elderly population. As the incidence of dizziness increases with age, our study in this era will help to identify any new trends in the distribution of patients with peripheral vertigo.

The most common age group in our study was 51-60 years, which is like the study by Raman et al and Neuhauser et al, but differs from the studies by Bhatia et al and Gopal et al, where the most common age group was 30-40 years.^{11,16,20,21}

Staibano et al found that 66.4% of the patients were male.¹² Yin et al conducted clinical epidemiologic research on vertigo and discovered that 59.28% of the 2,169 patients were male.¹³ Bittar et al conducted a study in Sao Paulo to examine the occurrence of dizziness. They found that out of 1,960 patients, 53% were male.¹⁴ The findings of all these studies coincide with our study, in which we found a male predominance of 60.5% of the total sample but Katsarkas found a female predominance with 62.81% of prevalence in females.¹⁹

In our study, the distribution of patients according to aetiology was as follows: 60.5% BPPV, 13.2% acute vestibular neuritis, 7.9% Meniere's disease, and 18.4% others. This was comparable with the studies done by Raman et al, Hulse et al, and Yin et al.^{13,15,20} In the research done by Yin et al, it was shown that BPPV is the predominant peripheral cause, followed by vestibular neuritis and Meniere's illness as the second and third most prevalent causes, respectively.

Meniere's disease is the primary cause of peripheral vertigo, making up 23.0% of cases, as found in investigations done by Muelleman et al and Bhatia et al.^{18,21} Muelleman et al found that vestibular migraine and BPPV occur at a rate of 19.1% each.¹⁸ Neupane et al conducted research that revealed that vestibular migraine is the primary cause of vertigo, with a prevalence rate of 36%.¹⁷ BPPV follows closely at 35%, while Meniere's disease is at 8%. PPPD, vestibular neuritis, and seizures account for 5%, 2%, and 2%, respectively. 4% of cases

exhibited a central cause, whereas 8% remained unidentified.

In our study, the occurrence rate of posterior canal BPPV is 56.5%, horizontal canal BPPV is 30.4%, and anterior canal BPPV is 17.1%. These rates align with the majority of existing literature on the subject. Our study's findings regarding the canal's involvement pattern are consistent with those of Swain et al's study.²² However, Seok et al reported that the horizontal canal BPPV was the most prevalent, accounting for 57.1% of cases in a sample size of 49.²³ The posterior canal and anterior canal were involved in 38.8% and 2.0% of cases, respectively.

CONCLUSION

Our study concludes that the most common age group affected by peripheral vertigo is 51–60 years. This means that the prevalence of vertigo is higher towards the later stage of life, which has the capability to compromise the quality of life in elderly people. The most frequent causes of peripheral vertigo in our study area are benign positional paroxysmal vertigo, vestibular neuritis, and Meniere's disease.

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