

## Original Research Article

# A CROSS-SECTIONAL STUDY ON THE ETIOLOGY AND CLINICAL PRESENTATION OF PATIENTS WITH VERTIGO

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## ABSTRACT

**Background:** Vertigo is defined as a sensation of motion or spinning of oneself or his surroundings. The lifetime prevalence of vertigo is found to be 3 to 10%<sup>2</sup>. Our study is aimed to find out etiology of vertigo in patients attending the ENT OPD and to evaluate the comorbidities in these patients.

**Materials and Methods:** We conducted a cross-sectional study in the outpatient department of ENT over a period of six months. Ninety- three patients who presented to the OPD with complaints of vertigo were included in our study. We took a detailed history regarding symptoms and a detailed ENT examination including otological and vestibular evaluation was done.

**Results:** In our study BPPV was the most common etiology (60.2%) of vertigo which was followed by migrainous vertigo (10.75%). The other etiological factors were orthostatic hypotension (7.5%), Meniere's disease (6.4%), vestibular neuritis (4.3%), labyrinthitis (5.3%), cervicogenic vertigo (3.2%) and psychogenic vertigo (2.1%).

**Conclusion:** There are several etiological factors for vertigo. This study emphasizes the importance of multidisciplinary approach in the management of vertigo.

**Keywords:** BPPV, vertigo.

## INTRODUCTION

Nearly one quarter of the population will experience dizziness at some point in their lifetime and among them 80 % will have symptoms severe enough to seek medical help.<sup>[1]</sup> Vertigo is defined as a sensation of motion or spinning of oneself or surroundings. The lifetime prevalence of vertigo is found to be from 3 to 10 %.<sup>[2]</sup> Vertigo is a distressing symptom for the patient. Vertigo usually affects the quality of life of many patients and hinders their daily activities.<sup>[3-5]</sup> Vertigo can arise due to multiple causes. Vertigo is a challenging problem for the treating clinicians due to the overlapping symptoms. Vertigo can be due to central or peripheral disorders. Peripheral vestibular symptoms are experienced by about 6.5% of people at some point of their lifetime.<sup>[6]</sup> Many of the peripheral vestibular disorders are misdiagnosed.<sup>[7,8]</sup> The most common causes of peripheral vertigo encountered in clinical practice include BPPV, Meniere's disease, vestibular neuritis, labyrinthitis, vestibular migraines etc. Our study is aimed to find

out the etiology of vertigo in patients attending ENT OPD and to evaluate the comorbidities in these patients.

## Aims and Objectives

1. To assess the clinical presentation and to find the etiology of vertigo In patients attending a tertiary care centre.
2. To assess the comorbidities among patients presenting with vertigo

## MATERIALS AND METHODS

A cross-sectional study was conducted in the department of Otorhinolaryngology over a period of six months from February 2025 to August 2025 after obtaining Institutional Ethical committee clearance (No.83/IEC/SUTAMS/2025). Ninety-three patients who came to the department of Otorhinolaryngology with complaints of vertigo were included in our study. We calculated sample size was calculated using the formula

$$n = \frac{(Z_{\alpha/2})^2 P Q}{d^2}$$

$Z_{\alpha/2}$  = critical value at 5% level of significance level (1.96)

P – prevalence of BPPV, the most common cause of vertigo (60%)

Q – 100 – P (40%)

d – absolute error (10%)

$$n = \frac{(1.96)^2 \times 60 \times 40}{(10)^2}$$

n = 93 samples

Sample size is calculated with reference to a study on the etiology of peripheral vertigo conducted by Vikram raj Mohanam, Nishanth Savery et al18.

#### Inclusion Criteria

1. Patients above the age of 12 years.
2. Patients with at least one episode of vertigo in the preceding month.

#### Exclusion Criteria

1. Patients less than 12 years of age.
2. Patients with cervical spine disease, cardiac diseases, neurological disorders.

Ninety-three patients with complaints of vertigo who satisfied the inclusion criteria were included in our study. A detailed history was collected from these patients which included the nature of their symptoms, onset, duration of symptoms, other accompanying symptoms like nausea, vomiting, tinnitus, hard of hearing, other comorbidities etc.

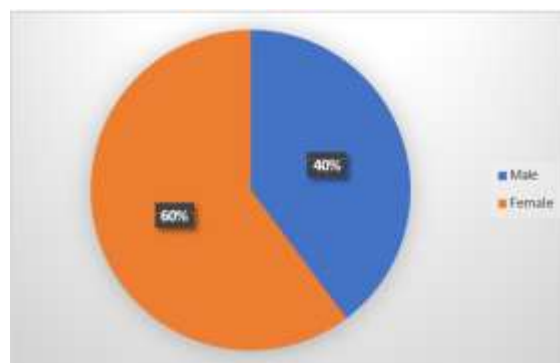
All these data were entered into a proforma. A detailed otological, vestibular, neurological and systemic evaluation was done in all patients. We made the diagnosis of BPPV based on the symptoms, elicitation of nystagmus and by maneuvers like Dix – Hallpike maneuver for posterior canal BPPV, supine roll over test for horizontal canal BPPV and straight head hanging test for superior canal BPPV. Orthostatic hypotension was diagnosed by looking for a drop of systolic blood pressure by 20 mmHg on standing from lying down position. Diagnosis of Meniere's disease was based on symptoms and audiometric findings. Vestibular neuritis was diagnosed in patients with symptoms of sudden severe vertigo without any hearing loss following a viral infection and by vestibular function tests.

Labyrinthitis was diagnosed based on symptoms and audiometric findings. Investigations like pure tone audiometry and tympanometry were done in all patients. CT scan and MRI were taken in indicated cases. Hematological investigations like complete

blood count, random blood sugar etc. and electrocardiogram were done in indicated cases.

## RESULTS

We included ninety three patients in our study, out of which fifty-six were female and thirty-seven patients were males.

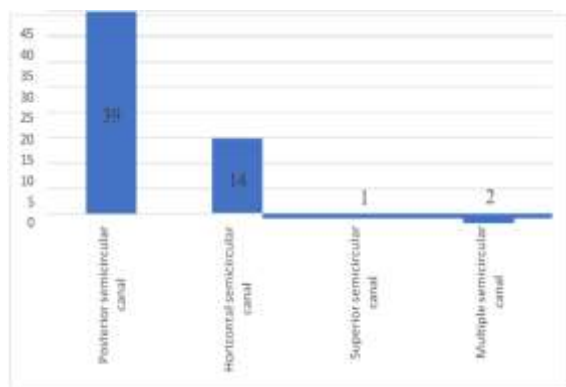


We had the maximum number of patients in the age group 41 to 50 years (44.75%). Duration of each episode, most commonly reported was between one minute and five minutes in 47 patients (52.2%).

Duration of symptoms more than 3 hours was reported by 6 patients (6.45%). Acute onset of vertigo was reported by 79 patients (84.9%) while 14 patients (15%) reported with insidious onset of symptoms. 90 patients (96.8%) had intermittent episodes of vertigo, while 3 patients had continuous symptoms lasting through out the day. Thirty-five patients had other symptoms associated with vertigo. The most common symptom associated with vertigo in our study was vomiting which was present in 16 patients. Other common accompanying symptoms were tinnitus and hard of hearing. In our study group, 22 patients had hypertension, 16 patients had diabetes, 9 patients had dyslipidemia and 7 patients had thyroid disorders. In our study the commonest etiological diagnosis was found to be BPPV 56 patients (60.2%) which was followed by migranous vertigo in 10 patients (10.75%). The other etiological factors were orthostatic hypotension in 7 patients (7.5%), Meniere's disease in 6 patients (6.4%), vestibular neuritis in 4 patients (4.3%), labyrinthitis in 5 patients (5.3%), cervicogenic vertigo in 3 patients (3.2%) and psychogenic vertigo in 2 patients (2.1%). Among the 56 patients with BPPV 33 patients had positional variation.

**Table 1**

Diagnosis	Frequency	Percentage
BPPV	56	60.21
Migranous vertigo	10	10.75
Orthostatic hypotension	7	7.52
Meniere's disease	6	6.45
Labyrinthitis	5	5.37
Cervicogenic vertigo	3	3.12
Psychogenic	2	2.15
Vestibular neuritis	4	4.30
Total	93	100.0



Among BPPV patients 69.64 % had involvement of posterior semicircular canal, 25% had involvement of horizontal semicircular canal, 1.78% had involvement of superior canal and 3.57% had involvement of more than one semicircular canal.

## DISCUSSION

Vertigo was more common in females (56 patients) compared to male (37 patients) in our study. This finding is comparable to a study conducted by Jasim N. Al – Isadi and Qasim A. Al-Lami,<sup>[9]</sup> in which female: male ratio was 2.09 :1. In a study conducted by Emre Gurses, Esma Akis et al. female to male ratio was 2:110. Hormonal factors and anatomical differences which occur in the peripheral vestibular system attribute to dizziness severity differences in females compared to males.<sup>[10]</sup>

In our study the commonest age group of patients was between 41 to 50 years followed by 51 to 60 years. In a study conducted by Hemant Mehar, Pranay Bhandari et al. 80 % of patients were between third and fifth decade of life.<sup>[11-15]</sup> This age-related increase in the prevalence can be due to the age-related changes in the vestibular system. We can also attribute this to the increased prevalence of comorbidities like cardiovascular diseases, hypertension and diabetes in the elderly population. Duration of each vertigo episode reported by majority of patients was between one and five minutes. This can be due to the fact that common etiology among our study patients were BPPV, migranous vertigo, and orthostatic hypotension. Fifty-three patients in our study group reported positional variation, of their symptoms. This can be explained by the fact that BPPV and orthostatic hypotension were the common etiologies in our study group. This finding is comparable to a study conducted by Shirad Syed, Himanshu Kumar et al,<sup>[11]</sup> where 64.5% patients reported positional variation in their symptoms. The associated symptoms noted in our study group were nausea and vomiting (45.7%), hard of hearing (17.1%) and tinnitus (11.4%). The common comorbidities observed in our study group were hypertension, diabetes, dyslipidemia and thyroid disorders. A study conducted by Mohammad Abdul and Deepak kumar noted dyslipidemia (14.14%), hypertension (7.97%) and diabetes mellitus (5.4%) as

the major comorbidities among BPPV patients.<sup>[12]</sup> In a study conducted by Shyam Sudhakar in vertigo patients (40.1 %) had hypertension, (17.2%) had diabetes and (13.1%) had dyslipidemia as comorbidities.<sup>[14]</sup> In our study group ninety patients had intermittent episodes of vertigo while three patients had continuous symptoms. This may be due to Meniere's disease or vestibular neuritis. Meniere's disease patients experience vertigo episodes lasting from several minutes to hours. In vestibular neuritis the symptoms can last for few days.

In the present study the commonest etiological diagnosis was BPPV (60.2%). This can be compared to a study conducted by Yue Xing Et al. which showed BPPV as the commonest cause of vertigo (55.3%).<sup>[13]</sup> In a study conducted by Shyam Sudhakar Sudarsan BPPV was the predominant cause of vertigo (41%) and other notable causes were orthostatic dysregulation and vestibular peripheral dysfunction.<sup>[14]</sup> In a study conducted by Burman D et al. BPPV was the most common cause of vertigo.<sup>[16]</sup> All these points to the need for the awareness of BPPV, its diagnosis and management among clinicians. In our study the second common diagnosis was migranous vertigo. The other causes in our study group were orthostatic hypotension (7.52%), Meniere's disease (6.45%), labyrinthitis (5.37%), vestibular neuritis (4.3%). A study conducted by Jeon E et al. showed orthostatic hypotension to be a major cause of orthostatic dizziness.<sup>[16]</sup> A study conducted by Shyam Sudhakar Sudarsan showed orthostatic dysregulation as the etiological factor in 17.2 % patients.<sup>[14]</sup> A study conducted by Hemant Mehar et al. Meniere's disease was found to the etiology in 16.5% cases.<sup>[15]</sup> The same study showed vestibular neuritis to be the cause in 5.5% cases. This was comparable to our study in which vestibular neuritis was the etiology in 4.3% cases. In a study conducted by Mahisha Ibraath among patients with peripheral vertigo 47% patients had BPPV, 12 % had Meniere's disease and 21% had vestibular neuritis.<sup>[17]</sup> In our study BPPV was the commonest etiology of vertigo. Among them 69.64 % had involvement of posterior semicircular canal, 25% had involvement of horizontal semicircular canal, 1.78% had involvement of superior canal and 3.57% had involvement of more than one semicircular canal. This finding is comparable to a study conducted by Vikram Raj Mohanam et al. which showed involvement of posterior canal in 80% patients, lateral semicircular canal in 16.7% patients and anterior canal in 3.3 % patients.<sup>[18]</sup> In a study conducted by Subramanya BT, Lohith S et al. in BPPV patients 85% patients showed involvement of posterior semicircular canal and 15 % patients showed involvement of lateral canal.<sup>[19,20]</sup>

## CONCLUSION

Among the patients attending emergency and outpatient departments vertigo is a very common

complaint. We have underestimated the importance and impact vertigo has in our health care management system. There are several etiological factors of vertigo. This emphasizes the need of a multidisciplinary approach in the evaluation and treatment of vertigo patients. A detailed history regarding symptoms and careful neurotological examination is important in the proper diagnosis of the etiology of vertigo.

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