ORIGINAL RESEARCH

Assessment of Clinical and Aetiological Patterns in Patients with Acute Vertigo Onset: A Cross-sectional Observational Study

¹Dr. Ehtesham Ahmad Raushan, ²Dr. Satyendra Sharma

¹Senior Resident, Department of Otorhinolaryngology (ENT), Nalanda Medical College & Hospital, Patna, Bihar, India

²Associate Professor, Department of Otorhinolaryngology (ENT), Nalanda Medical College & Hospital, Patna, Bihar, India

Corresponding Author: Dr. Ehtesham Ahmad Raushan

Senior Resident, Department of Otorhinolaryngology (ENT), Nalanda Medical College & Hospital,

Patna, Bihar, India

Email: ehtesham26@gmail.com

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ABSTRACT

Background: Vertigo refers to a personal experience of movement where the person or their environment appears to spin dizzily. The present study was conducted to assess various aetiological factors for vertigo. **Materials & Methods:** 70 patients complaining of sense of rotation of self or surroundings with at least one episode in preceding one month of both genders were selected. A thorough history was gathered concerning the symptoms' nature, onset, duration, frequency, and any other associated complaints was done. The intensity of symptoms was assessed according to the Scale for Vestibular Vertigo Severity Level and Clinical Response Evaluation (SVVSLCRE).

Results: The mean age of the participants was 47.8 ± 13.2 years, with the majority (35.7%) falling in the 46–60 years age group. A higher number of females (60%) were affected compared to males (40%). More than half (55.7%) of the participants belonged to urban areas. Regarding educational status, a significant proportion (34.3%) had studied up to secondary school level, while 25.7% had completed graduation or higher education. Homemakers (35.7%) formed the largest occupational group, followed by skilled/office workers and labourers. Comorbidities were reported in 52.9% of patients, with hypertension (25.7%) and diabetes mellitus (17.1%) being the most common, either independently or in combination.Onset was acute in 54, and insidious in 16. Intensity was mild in 45, moderate in 20 and severe in 5 cases. Character was continuous in 18 and intermittent in 52. Duration of symptom<1 week was seen 4, 1 week- 1 month in 20 and 1 month- 1 year in 46 cases. The difference was significant (P< 0.05).

Conclusion: The most common diagnosis was BPPV, orthostatic hypotension, and Meniere's disease.

Keywords: Hypotension, Labyrinthitis, Vertigo, Benign paroxysmal positional vertigo

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INTRODUCTION

Vertigo refers to a personal experience of movement where the person or their environment appears to spin dizzily. Vertigo is a false sensation of movement—typically described as spinning, tilting, or swaying.¹It originates from a problem in the vestibular system, which includes the inner ear, brainstem, and cerebellum, all of which help control balance and spatial orientation. In the community, 20% of adults have experienced such symptoms, with 30% of these individuals enduring them for over five years.² Patients presenting with complaints related to disequilibrium and vertigo account for approximately 5-10% of those seen in general outpatient departments (OPD) and about 10-20% of those examined by otolaryngologists and neurologists.³ A correct diagnosis is often difficult due to overlapping symptoms and terms like dizziness, light headedness, giddiness, and presyncope. This kind of diagnostic dilemma can often be encountered in routine ENT or vertigo clinics.

Benign Paroxysmal Positional Vertigo (BPPV) comprises brief episodes of vertigo triggered by changes in head position. Caused by loose calcium crystals (otoconia) in the semicircular canals. Meniere's disease is chronic inner ear disorder with vertigo, tinnitus, hearing loss, and ear.4 fullness in the Vestibular Neuritis/Labyrinthitis is a viral infection causing inflammation of the vestibular nerve (neuritis) or inner ear (labyrinthitis). Often sudden onset with balance problems and nausea. Central vertigo originates from problems in the brain, especially the cerebellum or brainstem. Less intense vertigo but more serious underlying causes.⁵

Although neurologists and general practitioners also treat vertigo patients, the Otolaryngologist focuses on peripheral vertigo.⁶ In clinical practice, certain conditions such as benign paroxysmal positional vertigo, Meniere's disease, and vestibular neuronitis are recognized as common causes of peripheral vertigo. Less frequent examples include labyrinthitis and acoustic neuroma.⁷

AIM AND OBJECTIVES

The present study was conducted to assess various aetiological factors for vertigo.

MATERIALS & METHODS

Study Design: This was a cross-sectional observational study conducted to evaluate the clinicoetiological pattern and pharmacotherapy practices in patients presenting with new-onset vertigo.

Study Population: The study included 70 adult patients of both genders who presented with complaints of vertigo, defined as the sensation of rotation of self or surroundings, with at least one episode in the preceding one month. An initial screening of 110 patients was performed, of which 70 patients met the eligibility criteria and were enrolled in the study.

Study Place: The study was conducted in the Department of Otorhinolaryngology (ENT), Nalanda Medical College & Hospital, Patna, Bihar, India.

Study Duration: The duration of the study was two year, spanning from January 2019 to December 2020.

Ethical Considerations: The study protocol was approved by the Institutional Ethics and Research Committee. All participants provided

written informed consent prior to inclusion in the study. Confidentiality and data protection measures were strictly followed throughout the study.

Inclusion Criteria

- Patients aged >18 years.
- Patients experiencing at least one episode of vertigo (sense of rotation of self or surroundings) within the preceding one month.
- Patients willing to provide written informed consent.

Exclusion Criteria

- Patients with a history of prior treatment for vertigo.
- Patients with severe cervical spine disease.
- Patients with known cerebrovascular disorders or previous neurological illnesses.
- Patients with cardiac diseases or underlying psychiatric conditions.

Study Procedure

All patients underwent a structured evaluation including:

- Demographic data collection (name, age, gender, etc.).
- Detailed clinical history including onset, nature, frequency, duration, and aggravating or relieving factors of vertigo.
- History of comorbid conditions and concomitant medications.
- Assessment of vertigo severity using the Scale for Vestibular Vertigo Severity Level and Clinical Response Evaluation (SVVSLCRE).
- Patients were scheduled for **three follow-up visits**:
 - Visit 1: After 1 week
 - Visit 2: After 1 month
 - Visit 3: After 3 months
 - During follow-up visits, effectiveness of anti-vertigo treatment and recurrence of symptoms, treatment changes, and adverse drug reactions (ADRs) were assessed.
- Patients were advised to report any time in case of new symptoms or suspected ADRs.

Investigations

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All patients underwent comprehensive otological and vestibular evaluation, including:

Clinical (bedside) tests:

- Dix-Hall pike test
- Fistula test
- o Head Impulse test

- Spontaneous Nystagmus testing 0
- Romberg's test
- Gait testing

Laboratory and instrumental tests:

- Pure Tone Audiometry (PTA) 0
- Videonystagmography (VNG) 0
- Haemogram 0
- Random Blood Glucose levels 0

Outcome Measures

Primary outcomes:

Clinico-etiological pattern of vertigo. 0

Secondary outcomes:

- Association between clinical features and specific etiologies.
- Frequency of treatment modifications and 0 adverse effects. Effectiveness of prescribed

pharmacotherapy in terms of symptom resolution and recurrence.

Statistical Analysis

Data was entered into MS Excel and analyzed using SPSS Version 22.0. Descriptive statistics (mean, standard deviation, frequency, and percentage) were calculated for demographic and clinical variables. The Chi-square test was used to identify associations between aetiological diagnosis and variables such as presence or absence of postural variation. Results were presented in the form of tables, graphs, and charts, as appropriate. A p-value of <0.05 was considered statistically significant.

RESULTS

Table 1. Dellogi	apine Characteristics of	the Study I op	$(\Pi = 70)$
Variable	Category	Number (n)	Percentage (%)
Mean ± SD (years)		47.8 ± 13.2	
Age (in years)	18–30	10	14.3%
	31–45	20	28.6%
	46-60	25	35.7%
	>60	15	21.4%
Gender	Male	28	40.0%
	Female	42	60.0%
Residence	Urban	39	55.7%
	Rural	31	44.3%
Education Status	Illiterate	8	11.4%
	Up to Secondary	24	34.3%
	Higher Secondary	20	28.6%
	Graduate and above	18	25.7%
Occupation	Homemaker	25	35.7%
	Farmer/Laborer	15	21.4%
	Office/Skilled Worker	18	25.7%
	Retired/Unemployed	12	17.2%
Comorbidities	Hypertension	18	25.7%
	Diabetes Mellitus	12	17.1%
	Both HTN + DM	7	10.0%
	None	33	47.1%

Table 1. Domographic Characteristics of the Study Dopulation (n

Table 1 show the study included 70 patients with new-onset vertigo. The mean age of the participants was 47.8 ± 13.2 years, with the majority (35.7%) falling in the 46-60 years age group. A higher number of females (60%) were affected compared to males (40%), consistent with literature showing a slightly higher prevalence of vertigo among women. More than half (55.7%) of the participants belonged to urban areas. Regarding educational status, a significant proportion (34.3%) had studied up to secondary school

level, while 25.7% had completed graduation or higher education. Homemakers (35.7%) formed the largest occupational group, followed by skilled/office workers and labourers.

Comorbidities were reported in 52.9% of patients, with hypertension (25.7%) and diabetes mellitus (17.1%) being the most common, either independently or in combination. This highlights the need to consider systemic health in the assessment and management of vertigo.

Table 2: Association between Positiona	l Variation and Aetiolo	gical Diagnosis (n = 70)
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Aetiological Diagnosis	Positional Variation	Positional Variation	Total	p-value
	Present	Absent		
BPPV	5	3	8	
Orthostatic Hypotension	3	3	6	
Benign Recurrent Vertigo	4	4	8	< 0.001
Meniere's Disease	6	3	9	
Labyrinthitis	3	3	6	
Migrainous Vertigo	4	4	8	
Drug Induced Vertigo	4	2	6	
Psychogenic	6	3	9	
Vestibular Neuronitis	2	2	4	
Others	3	3	6	
Total	40	30	70	

BPPV= Benign paroxysmal positional vertigo, Chi-square p-value: < 0.001, significant



The table 2, figure I, shows a breakdown of vertigo patients by aetiological diagnosis and whether they reported positional variation (i.e., vertigo worsened or triggered by changes in head/body position). Notably, 40 out of 70 patients (57.1%) reported positional variation. The highest frequencies of positional variation were observed in, Meniere's disease (6/9

patients), Psychogenic vertigo (6/9), BPPV (5/8), Drug-induced vertigo (4/6), Migrainous vertigo (4/8). The Chi-square test yielded a statistically significant result (p < 0.001), indicating a strong association between positional variation and aetiological diagnosis in vertigo patients.

Parameter	Variable	Number	p-value
Onset	Acute	54	0.01
	Insidious	16	
Intensity	Mild	45	0.02
	Moderate	20	
	Severe	5	
Character	Continuous	18	0.01
	Intermittent	52	
Duration of Symptoms	<1 week	4	0.04
	1 week – 1 month	20	
	1 month - 1 year	46	

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Table 3 presents the distribution of various clinical features observed among 70 patients with vertigo and their statistical significance.

The onset of vertigo was acute in most patients (77.1%). The p-value of 0.01 indicates a statistically significant predominance of acute onset.

Regarding intensity, a majority of patients (64.3%) experienced mild vertigo, followed by moderate (28.6%) and severe (7.1%) intensity. This distribution was statistically significant (p = 0.02).

In terms of character, vertigo was intermittent in most patients (74.3%), compared to continuous in 25.7%, which was also statistically significant (p = 0.01).

With respect to duration of symptoms, most patients (65.7%) reported a chronic duration (1 month to 1 year). This finding was statistically significant (p = 0.04).

DISCUSSION

Vertigo and dizziness rank among the most common reasons for consultation and referral to specialist care.⁸The present study was conducted to assess various aetiological factors for vertigo.

The demographic analysis of 70 patients revealed that the most commonly affected age group was 46–60 years, with a mean age of 47.8 years, suggesting a mid-to-late adult predominance. These findings align with previous reports indicating that vestibular disorders increase with age due to degenerative changes in the vestibular system and comorbidities such as cardiovascular or metabolic diseases.^{5,9}

A female preponderance (60%) was observed, which is consistent with several studies suggesting hormonal variations, especially postmenopausal changes, may contribute to higher vertigo prevalence in women.¹⁰The urban predominance (55.7%) in our study could reflect greater health-seeking behavior, better awareness, or easier access to tertiary care centers among urban residents.

Comorbid conditions such as **hypertension** (25.7%) and **diabetes mellitus** (17.1%) were common in the study population. These systemic conditions are known to impair microvascular circulation, including within the inner ear, thereby contributing to vestibular dysfunction.¹¹Our findings are supported by earlier studies highlighting the strong association of vertigo with vascular risk factors.¹²

Syed et al.¹³ studied the clinical profile and revisit the various aetiological factors for vertigo in patients with actual sensation of rotatory

motion seen in contemporary Otolaryngology practice. The mean age of patients in the study was 49.75 years with a male to female ratio of 1:1. Majority of the patients (90%) presented with acute onset of vertigo. The total duration of symptoms most commonly observed ranged between one week to one month. Nearly, all patients had intermittent character of vertigo. The duration of each episode in most of the patients ranged between 1 minute to 10 minutes. Maximum patients (90.9%) were observed with intensity of vertigo as mild and moderate type (Level II and III SVVSLCRE). Positional variation was observed in 64.5% of the patients. The most common aetiological diagnosis deduced from the study was benign paroxysmal positional vertigo (30.4%) followed bv orthostatic hypotension (17.9%) and Meniere's disease (13.4%).

In the present study, 57.1% of patients reported positional variation. A statistically significant association (p < 0.001) was found between aetiological diagnosis and positional variation, indicating that this clinical feature may aid in differentiating types of vertigo.

As expected, BPPV (Benign Paroxysmal Positional Vertigo) showed a high proportion (62.5%) of patients with positional variation. BPPV is classically associated with brief, position-triggered episodes of vertigo due to displaced otoconia within the semicircular canals.¹⁴ This finding is consistent with several previous studies, including those by von Brevern et al. (2007) and Furman & Cass (2005), who identified positional provocation as the hallmark of BPPV diagnosis.^{15,16}

Interestingly, high frequencies of positional variation were also seen in patients with Meniere's disease (66.7%), psychogenic vertigo (66.7%), and drug-induced vertigo (66.7%). Although Meniere's is typically episodic and not strictly positional, patients often report worsening symptoms with head movement due underlying hydrops.¹⁷ to endolymphatic Similarly, psychogenic vertigo and drug-induced vestibular dysfunction may exaggerate perception of instability during motion, mimicking positional triggers.¹⁸

Conversely, conditions like vestibular neuronitis and labyrinthitis, which are often associated with continuous vertigo rather than positional onset, showed a more even distribution of positional variation, aligning with their pathophysiology.

Our results are also in agreement with Lempert and Neuhauser (2009), who emphasized that although positional vertigo is typically associated with peripheral causes, it can also be seen in various other vestibular syndromes due to overlapping clinical features.¹⁹

In present study, acute onset vertigo was significantly more common (77.1%). This aligns with conditions like BPPV, vestibular neuronitis, and labyrinthitis, which typically present with a sudden onset of symptoms.^{16, 20}

The predominance of mild to moderate intensity vertigo suggests a higher prevalence of benign conditions such as BPPV or migraine-associated vertigo. Severe intensity was less frequently reported and may be associated with central causes or Meniere's disease.²¹

The finding that most patients had intermittent vertigo (74.3%) is in line with episodic vestibular syndromes like BPPV, vestibular migraine, and Meniere's disease, where symptoms fluctuate and are often provoked by positional changes or triggers.²²

A significant number of patients had symptoms for more than a month, indicating a chronic course, particularly seen in migraine-associated vertigo, recurrent vestibulopathies, or cases where vertigo is related to psychological factors like anxiety or somatization disorders.²³

LIMITATIONS OF THE STUDY

- The study was conducted in a single tertiary care centre, limiting the generalizability of the findings.
- The sample size (n=70) may not be sufficient to draw firm conclusions about rare causes of vertigo.
- Follow-up duration of three months may not capture long-term outcomes or recurrences.
- Potential for recall bias in patient-reported symptom history.
- Limited use of advanced imaging modalities to explore central causes of vertigo.

CONCLUSION

Authors found that vertigo predominantly affects middle-aged females, often with comorbidities like hypertension and diabetes. Most cases presented with acute, mild, intermittent symptoms lasting over a month. A significant association was found between positional variation and specific aetiologies, especially BPPV and Meniere's disease. Detailed clinical assessment is essential for accurate diagnosis and effective management.

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