Etiological Distribution of Vertigo in Otorhinolaryngology Outpatient Department in a Tertiary Care Center: An Observational Study in North Eastern Indian Population

Jijitha Lakshmanan[1], Hanifa Akhtar[2], N.Brian Shunyu[3], Ruuzeno Kuotsu[4], Aswathi K V[5], Nisha Kumari[6]

Received on: 03 March 2025; **Revision on :** 02 April 2025; **Accepted on:** 03 April 2025; **Published on:** 07 April 2025

ABSTRACT

Objective: To study the various etiologies of vertigo in the patient population presenting to the Otolaryngology Outpatient Department in a tertiary center in North Eastern India.

Materials and Methods: Our current study included 213 participants who presented to the ENT Outpatient Department in a tertiary institute in North Eastern India with complaints of giddiness or vertigo during the period from April 2024 to December 2024. Required clinical data was collected by verification of medical records maintained in the vertigo clinic. And etiologic distribution for vertigo was also studied.

Results: Of the 213 patients studied, 62.79% were females, and 37.21% were males. The median age range of the population was 45-60 years.

The etiologies for vertigo prevalent in the study population were: Benign Paroxysmal Positional Vertigo (BPPV) (34.74%) Vestibular Migraine (26.29%), Meniere's Disease (18.3%), Central vertigo (5.16%), Labyrinthitis (3.38%), Vestibular Neuronitis (2.81%) and a spectrum of other rare etiologies. A few cardiovascular and functional causes of giddiness were also identified.

Conclusion: BPPV involving the posterior semicircular canal is the most common etiology of vertigo in the study population. Vestibular Migraine and Meniere's Disease respectively represented the second and third common etiologies. A few rare peripheral vestibular, neurological, and cardiovascular causes were also identified.

Key words: Vertigo, Giddiness, Vertigo clinic, BPPV, Etiology

INTRODUCTION

Giddiness is one of the most common symptoms to come across in patient populations visiting Otolaryngology, Neurology, and General Medicine clinical practice. It includes various spectrum of diagnoses and encompasses various terminologies like light headedness, dizziness and vertigo. 3-7% of the patients in the general population experience vertigo according to available literature; while 15-30% of patients experience so called 'giddiness'.[1] A number of physiological systems are to be evaluated for this vague symptomatology of giddiness.[2] Due to this, patients with giddiness tend to get shuttled between different Out-Patient Departments before coming to a definitive diagnosis, which materializes the definitive treatment. Considering the debilitating nature of this symptom, earlier diagnosis and earlier initiation of treatment are mandatory. The concept of 'vertigo clinic' has evolved over years to bring this wide spectrum of vertigo under a single arm to facilitate early diagnosis and treatment. Giddiness can occur due to simple correctable causes like hypoglycemia, anemia to complex tumors involving the cerebellopontine angle.

Access this article online	
Website: **https:**//ajohns.net/	Quick Response Code
DOI: 10.66243/Krishers-AJOHNS-003	

Assistant Professor[1], Associate Professor[2], Professor[3], Senior Resident[4,5], Junior Resident[6]
Department of ENT and Head & Neck Surgery[1-5]
All India Institute of Medical Sciences (AIIMS), Guwahati

Corresponding Author: Jijitha Lakshmanan
Assistant Professor
Department of ENT
All India Institute of Medical Sciences (AIIMS), Guwahati
Email ID: jilaks@gmail.com

Source of funding: None
Conflict of interest: None declared

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: sabarish@krishers.com

How to cite this article: Jijitha L, Hanifa A, N.Brian S, Ruuzeno K, Aswathi K V, Nisha K . Etiological Distribution of Vertigo in Otorhinolaryngology Outpatient Department in a Tertiary Care Center: An Observational Study in North Eastern Indian Population . J Otolaryngol Head Neck Surg. 2025; 1(1):10-14

Usually, the diagnosis of vertigo traverses the path of history taking, which encompasses detailed analysis of the individual episode of giddiness to characterize the duration of each episode, pattern of giddiness, triggers, exacerbating factors, and associated symptoms. There is a need to evaluate the various diagnoses of vertigo in specific population groups to channel the patients to specialists for their optimal benefit.

MATERIALS AND METHODS

Study Participants

Our current study included 213 participants who presented to the ENT Outpatient Department with complaints of giddiness or vertigo during the period from April 2024 to December 2024.

Exclusion criteria were those patients with a known history of neurological disorders leading to disequilibrium or gait imbalance like ataxias, Parkinsonism, and those patients who are bedridden with complaints of giddiness in whom neurotological examination and positional tests are difficult to perform.

Permission to use their medical records for study purposes was taken from all the patients involved. The study was started after clearance from the Institute Ethical Committee.

Data Collection

A detailed clinical history of the participants was obtained to characterize the diagnosis. Further evaluation was done by thorough neurotological evaluation with positional tests and audio vestibular tests including: Pure Tone Audiogram (PTA), Vestibular Evoked Myogenic Potential (VEMP), Videonystagmography (VNG) and Electrocochleography (ECochG) and radiological imaging (High Resolution Computed Tomography (HRCT) of the temporal bone and magnetic Resonance Imaging (MRI)of the Brain) whenever necessary. Etiological diagnoses were derived based on a detailed clinical discussion of the scenario in the Vertigo clinic by experts in Neurotology considering the validated diagnostic criterion published in literature. Data required for this study was obtained from the registers maintained in the ENT OPD under Vertigo Clinic.

RESULTS

Our study was an observational study to look into the various etiological diagnoses for vertigo in the study population who were evaluated for vertigo/giddiness in the Vertigo clinic.

213 participants were included in the study. The study population belonged to a wide age group ranging from 9 years to 74 years, with the median age range at presentation being 45-60 years.

The study population had a gender distribution of 62.79% females and 37.21% males; the female to male ratio was 1.68:1.

Various diagnostic causes attributing to vertigo were made by thorough history taking, Neuro-otological examination, positional tests specific for semicircular canals, combined with audio vestibular investigations like Pure Tone Audiogram (PTA), Vestibular Evoked Myogenic Potential (VEMP), Videonystagmography (VNG) and ECochG with added radiological evaluation whenever warranted.

Table 1: summarizes the various diagnoses that could be arrived at with the available armamentarium in our clinical setting.

Table 1: Various diagnoses of Vertigo/giddiness in our study population

Sl No.	Diagnosis	No. of patients (n=213)
1	BPPV)	74
2	Vestibular Migraine	56
3	Meniere's Disease	39
4	Central Neurological causes	11
5	Labyrinthitis	7
6	Vestibular Neuronitis	6
7	Orthostatic Hypotension	6
8	Others*	14

*Others include rare causes of vertigo that came across in our study group like: Combination of Meniere's Disease and Vestibular Migraine (3), Autoimmune Inner Ear Disease (2), Cardiologic causes (2), Combination of BPPV and Vestibular Migraine (1), Post mastoid surgery (2), Stress Induced (1), Cervical Spondylosis (1), Vestibular Paroxysmia (1), Functional (1) and 4 undiagnosed.

As summarized in the table, BPPV) was the most prevalent etiology for vertigo in our study population and was found in 34.74% of our patients. Posterior Semicircular Canal (PSCC) BPPV was the most common in the study population; 2 patients also had Lateral Semicircular Canal BPPV. This was followed by Vestibular Migraine in 26.29% of the patients. These two were clinical diagnoses but were supplemented with a few audiovestibular tests for academic and research purposes.

The third most prevalent cause for vertigo in the study population was Meniere's disease, which could be attributed to 18.3% of patients. Beyond these three main diagnoses, few patients had varying combinations of these as in 3 patients on evaluation were found to have Meniere's disease superimposed with Vestibular Migraine, while one patient had BPPV superimposed with Vestibular Migraine.

Eleven cases (5.16%) of central vertigo were evaluated and referred to the Neurology clinic. These were all patients who presented with a history of varying severity of giddiness with a history of events resembling a Transient Ischemic Attack (TIA).

Labyrinthitis (Seven patients) (3.38%) and Vestibular Neuronitis (Six patients) (2.81%) together contributed to 6.1% of our Vertigo diagnosis. These were followed by other rare vestibular causes of vertigo like Autoimmune ear Disease, Post- Mastoid Surgery, and Vestibular Paroxysmia.

Cardiologic causes were also identified in two patients who presented with syncopal attacks, and one patient with functional vertigo was diagnosed as well. (Fig.1)

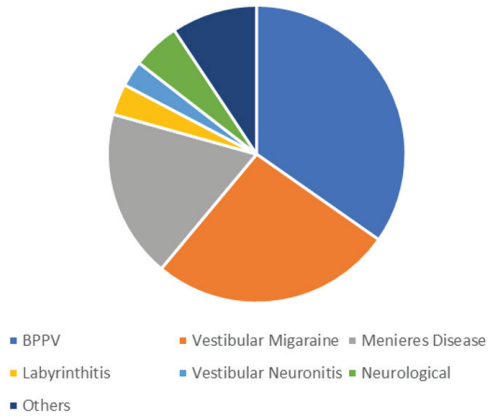

Fig 1: Pie diagram showing the etiological distribution of vertigo in the study population.

DISCUSSION

Vertigo and giddiness are terms used sometimes interchangeably to represent one of the most common clinical symptoms that is evaluated in Otolaryngology clinics. The spectrum of vertigo includes various diagnoses about vestibular, central neurological, cardiovascular, and functional causes.

In our study, attempts were made to do a broad assessment of the etiology of vertigo in the patient population in North Eastern India. The diagnostic strategies adopted were detailed symptomatic analysis based on a thorough clinical history, along with neurotological examination supplemented by audio vestibular tests (PTA, VEMP, VNG, and ECochG) and Magnetic Resonance Imaging (MRI) whenever required.

The results of the current study coincided with the available literature on the etiological factors of vertigo.

The age group that attended the vertigo clinic belonged to a wider age range, but the majority were in the age range of 45-60 years (40%). In a study by Alexander et al., 46.7% of the study population belonged to the age group of 45-60 years, which goes along with the age distribution in our study population.3 But this is in contrast to the findings in many other studies were that older populations (>60 yrs) are most predisposed to symptoms of dizziness.[4] This difference could be attributed to the quality of life and health care in the reference western population and the importance given to neurocognitive problems in older adults. The etiology of vertigo in the majority of our study population was BPPV involving the Posterior Semicircular canal. Vestibular migraine caused the majority of vertigo symptoms in the younger age group in our study population (patients less than 45 years). A multiparametric analysis on the relation of onset of vestibular migraine with age-related factors by Michele Ori et al. states that the mean age of patients diagnosed with vestibular migraine was 38.2+/-9.6years.[5] This could be correlated with the rapid reduction in the onset of symptoms related to Migraine beyond the age of years.[6]

26.6% of the peripheral vertigo is attributed to BPPV.[7] And BPPV remains the predominant cause for vertigo in the age group of 40- 60 years with no gender preponderance in a study by Anirban Ghosh et al.[8] Our study findings also correlated with this pre-existing literature. Most of these patients had idiopathic BPPV. We had 1 case of secondary BPPV, which presented in combination with Vestibular Migraine.BPPV diagnosis was clinical based on a thorough history eliciting onset of vertigo with positional changes of the head and detailed positional tests. Dix Hall pikes test was the diagnostic positional maneuver performed as PSCC- BPPV is the most common, although all the three semicircular canals can be involved by BPPV. These patients were effectively treated with Epley's maneuver.[9]

The second predominant etiology for vertigo contributing to 26.29% of the study population was Vestibular Migraine. The diagnostic criteria were laid by the International Barany Society.[10] which includes: Moderate to severe vestibular symptoms each lasting for 5 mins to 72 hours for at least 5 times;[11] Current or previous history of migraine with or without aura according to the International Classification of Headache Disorders (ICHD3),[12] A minimum of 50% of the episodes of vestibular events are associated with one or more features of migraine like unilaterality, pulsatile nature of headache, moderate to severe intensity of pain which is aggravated by intense lights and noise and associated with visual aura;[13-15] And the episodes cannot be attributed to any other vestibular diagnosis.[15]

As described in literature, in our study population also, headache was a meagre symptom that becomes only obvious on probing or retrospective analysis of clinical history.[16] Symptom-based treatment was advised for these patients.

18.3% of our patients were diagnosed with Meniere's Disease. Meniere's Disease with Vestibular Migraine was also diagnosed in two patients. Meniere's Disease was diagnosed in our patients based on the criteria for diagnosis of definitive Meniere's disease by a collaborative work among the Equilibrium Committee of the AAO-HNS, the Japan Society for Equilibrium Research, the EAONO, the Korean Balance Society, and the Bárány Society by 2014.[17]

The criteria for diagnosis of Definite Meniere's Disease comprises of spontaneous vertigo episodes lasting for 20 minutes to12 hours, with PTA proven unilateral sensorineural hearing loss in the low to medium frequencies before, after or during the vertigo episode, and these symptoms of hearing loss, tinnitus or ear fullness are fluctuating in nature and no other vestibular symptoms can explain these symptoms.[18-23]

In patients with Meniere's Disease, in addition to clinical history and Pure Tone Audiometry, Electrocochleography was used as a supplementary confirmatory investigation in our study population.[24]

Other peripheral causes of vertigo identified in the current study include: Labyrinthitis, Vestibular Neuronitis, Vestibular Paroxysmia, Autoimmune Inner Ear Disease, and Post mastoid surgeries. These were relatively rare as in any etiological study for the causes of vertigo. Neurological and cardiovascular causes could also be identified. A few unidentified cases of vertigo also remained a challenge in our study.

Limitations of the study:

The study duration was not long enough to incorporate a larger sample size that would have better represented the patient population in North Eastern India. A detailed analysis of gender and age group predisposition to various etiological factors of vertigo could not be performed in the current study. Detailed symptomatic analysis of each etiological diagnosis could not be described in detail in our study. Optimal audio vestibular diagnostic tests were only performed for diagnosis of the etiologies described due to resource limitations.

In-depth analysis of etiological correlation with age group at presentation and gender and correlation of symptomatology and audio vestibular parameters with the diagnosis are the scopes for expansion of the current study.

CONCLUSION

Vertigo is a common, sometimes debilitating symptom in patients presenting to Otolaryngology clinics in Northeastern India. BPPV is the most commonly identified cause of vertigo followed by Vestibular Migraine and Meniere's disease in our study population. There was no significant gender predilection in our study population, and vertigo was more prevalent in the age group of 45-60 years. Rare causes of peripheral vertigo should also be kept in mind in unsolvable cases. However, even with a complete clinical and diagnostic armamentarium, a few cases of vertigo remain undiagnosed. An open thought process to consider neurological and cardiovascular causes is sometimes mandatory for complete etiological evaluation of vertigo.

REFERENCES

1. Xing Y, Si L, Zhang W, Wang Y, Li K, Yang X. Etiologic distribution of dizziness/vertigo in a neurological outpatient clinic according to the criteria of the international classification of vestibular disorders: a single-center study. Journal of Neurology. 2024 May;271(5):2446-57.
2. Muncie HL, Sirmans SM, James E. Dizziness: approach to evaluation and management. American family physician. 2017 Feb 1;95(3):154-62.
3. Wassermann A, Finn S, Axer H. Age-associated characteristics of patients with chronic dizziness and vertigo. Journal of geriatric psychiatry and neurology. 2022 Jul;35(4):580-5.
4. Fancello V, Hatzopoulos S, Santopietro G, Fancello G, Palma S, Skarżyński PH, Bianchini C, Ciorba A. Vertigo in the elderly: a systematic literature review. Journal of Clinical Medicine. 2023 Mar 11;12(6):2182.
5. Ori M, Arra G, Caricato M, Freccia R, Frati F, De Bonis T, Ricci G, Faralli M. Age-related features in vestibular migraine onset: a multiparametric analysis. Cephalalgia. 2020 Dec;40(14):1605-13.
6. Politi L, Salerni L, Bubbico L, Ferretti F, Carucci M, Rubegni G, Mandalà M. Risk of falls, vestibular multimodal processing, and multisensory integration decline in the elderly–Predictive role of the functional head impulse test. Frontiers in neurology. 2022 Nov 16; 13:964017.
7. Zamergrad MV, Parfenov VA, Yakhno NN, Melnikov OA, Antonenko LM, Nefedovskaya LV, Lebedeva NV. Common causes of vertigo and dizziness in different age groups of patients. Bionanoscience. 2017 Jun; 7:259-62.
8. Ghosh A, Dorasala S. Epidemiology of benign paroxysmal positional vertigo (BPPV) and risk factors for secondary BPPV: a population-based study. The Egyptian Journal of Otolaryngology. 2023 Jun 6;39(1):93.
9. Viirre E, Purcell I, Baloh RW. The Dix-Hallpike test and the canalolith repositioning maneuver. The Laryngoscope. 2005 Jan;115(1):184-7.
10. Lempert T, Olesen J, Furman J, Waterston J, Seemungal B, Carey J, Bisdorff A, Versino M, Evers S, Newman-Toker D. Vestibular migraine: diagnostic criteria: consensus document of the Bárány Society and the International Headache Society. Der Nervenarzt. 2013 Apr; 84:511-6.
11. Zhang Y, Kong Q, Chen J, Li L, Wang D, Zhou J. International Classification of Headache Disorders 3rd edition beta-based field testing of vestibular migraine in China: Demographic, clinical characteristics, audiometric findings and diagnosis statues. Cephalalgia. 2016 Mar;36(3):240-8.
12. Lempert T, Olesen J, Furman J, Waterston J, Seemungal B, Carey J, Bisdorff A, Versino M, Evers S, Kheradmand A, Newman-Toker D. Vestibular migraine: Diagnostic criteria (Update) Consensus document of the Bárány Society and the International Headache Society. Journal of Vestibular Research. 2022 Jan 11;32(1):1-6.
13. Liveing E. On megrim, sick-headache, and some allied disorders: a contribution to the pathology of nerve-storms. J. and A. Churchill; 1873.
14. Kuritzky A, Ziegler DK, Hassanein R. Vertigo, motion sickness and migraine. Headache: The Journal of Head and Face Pain. 1981 Sep;21(5):227-31.
15. Formeister EJ, Rizk HG, Kohn MA, Sharon JD. The epidemiology of vestibular migraine: a population-based survey study. Otology & neurotology. 2018 Sep 1;39(8):1037-44.
16. De Rijk P, Resseguier N, Donnet A. Headache characteristics and clinical features of elderly migraine patients. Headache: The Journal of Head and Face Pain. 2018 Apr;58(4):525-33.
17. Lopez-Escamez JA, Carey J, Chung WH, Goebel JA, Magnusson M, Mandalà M, Newman-Toker DE, Strupp M, Suzuki M, Trabalzini F, Bisdorff A. Diagnostic criteria for Menière's disease. Journal of vestibular research. 2015 Jan 1;25(1):1-7.
18. Rauch SD, Merchant SN, Thedinger BA. Meniere's syndrome and endolymphatic hydrops: double-blind temporal bone study. Annals of Otology, Rhinology & Laryngology. 1989 Nov;98(11):873-83.

19. Merchant SN, Adams JC, Nadol Jr JB. Pathophysiology of Meniere's syndrome: Are symptoms caused by endolymphatic hydrops? Otology & Neurotology. 2005 Jan 1;26(1):74-81.

20. Bisdorff A, Von Brevern M, Lempert T, Newman-Toker DE. Classification of vestibular symptoms: towards an international classification of vestibular disorders. Journal of Vestibular Research. 2009 Jan 1;19(1-2):1-3.

21. Perez-Garrigues H, Lopez-Escamez JA, Perez P, Sanz R, Orts M, Marco J, Barona R, Tapia MC, Aran I, Cenjor C, Perez N. Time course of episodes of definitive vertigo in Meniere's disease. Archives of Otolaryngology–Head & Neck Surgery. 2008 Nov 17;134(11):1149-54.

22. Nabi S, Parnes LS. Bilateral Ménière's disease. Current opinion in otolaryngology & head and neck surgery. 2009 Oct 1;17(5):356-62.

23. Lopez-Escamez JA, Viciana D, Garrido-Fernandez P. Impact of bilaterality and headache on health-related quality of life in Meniere's disease. Annals of Otology, Rhinology & Laryngology. 2009 Jun;118(6):409-16.

24. Nguyen LT, Harris JP, Nguyen QT. Clinical utility of electrocochleography in the diagnosis and management of Meniere's disease: AOS and ANS membership survey data. Otology & Neurotology. 2010 Apr 1;31(3):455-9.