



**VERTIGO: A COMPREHENSIVE REVIEW OF  
COMMON PERIPHERAL AND CENTRAL  
VESTIBULAR DISORDERS**  
Prateek Bansal<sup>1</sup>, Hanumanthrao C Patil<sup>2</sup>, Rajesh Kumari Patil<sup>3\*</sup>

---

**ArticleHistory:Received:**08.03.2023

**Revised:**21.05.2023

**Accepted:**13.07.2023

---

**Abstract**

The phrase "dizziness" can apply to either an uncomfortable disturbance unsteady, faintness or to a mistaken perception of movement, which is more precisely referred to as "vertigo." Vertigo is a condition in which a person feels as though their body is rotating or swaying, their surroundings are moving, or both. Postural vertigo which is a type of vertigo mimics the feeling of sense of existence on a boat (for example, bilateral vestibulopathy) while rotatory vertigo reminds one of the sense of being on a rotating wheel. Many patients refer to lightheadedness without any sensation of movement as "dizziness" when they are intoxicated by drugs. Peripheral vestibular diseases are functionally divided into three primary categories, which based on their usual symptoms and indicators. The majority of frequent causes of vertigo is benign paroxysmal positioning vertigo (BPPV), and many patients provide information that is sufficient for a phone diagnosis. Most often, bouts of BPPV linger for many weeks before spontaneously ceasing, only to recur several weeks, months, or even years later.

**Keywords:** Vertigo, dizziness, headedness, vestibulopathy, BPPV, postural

---

<sup>1</sup>Pharm.D (Student), Adesh Institute of Pharmacy and Biomedical Sciences, Adesh University, Bathinda

<sup>2\*</sup>Professor & Principal, Department of Pharmacy Practice, Adesh Institute of Pharmacy and Biomedical Sciences, Adesh University, Bathinda

<sup>3</sup>Professor & HoD, Department of Pharmacy Practice, Adesh Institute of Pharmacy and Biomedical Sciences, Adesh University, Bathinda

Email: <sup>1</sup>prateekbansal414@gmail.com, <sup>2</sup>hcpatil@gmail.com, <sup>3\*</sup>rkpatil3014@gmail.com

**\*Corresponding Author:**

Rajesh Kumari Patil<sup>3\*</sup>

<sup>3\*</sup>Professor & HoD, Department of Pharmacy Practice, Adesh Institute of Pharmacy and Biomedical Sciences, Adesh University, Bathinda

Email: <sup>3\*</sup>rkpatil3014@gmail.com

**DOI: 10.31838/ecb/2023.12.s3.660**

## **1. Introduction**

Dizziness has a subtype called vertigo that is a result of an imbalance in inner ear in the vestibular system. The history of the patient is typically essential for distinguishing between peripheral and central causes of vertigo. A physical therapy technique can effectively take care of benign paroxysmal positional vertigo, the majority of the common type of vertigo[1]. Vertigo can also be caused by migraine, Meniere's syndrome, vestibular neuritis, and these conditions. When a specific reason cannot be identified, antivertiginous and antiemetic medications can decrease symptoms. However, treatment should always focus on the underlying cause. In general, these medications are not recommended for every day, long-term use.[2]

The phrase "dizziness" can apply to either an uncomfortable disturbance, unsteady, faintness or to a mistaken perception of movement, which is more precisely referred to as "vertigo." Vertigo is a condition in which a person feels as though their body is rotating or swaying, their surroundings are moving, or both. They have a lifetime prevalence of 20% to 30%[3]. Because "dizziness" can signify so many various things, a patient's complaint of it calls for a complete history to be taken. Ancillary testing is only marginally significant. The following are crucial factors for separating them from one another:

Postural vertigo which is a type of vertigo mimics the feeling of sense of existence on a boat (for example, in bilateral vestibulopathy), while rotatory vertigo reminds one of the senses of being on a rotating wheel. Many patients refer to light-headedness without any sensation of movement as "dizziness" when they are intoxicated by drugs, for example.

Vertigo bouts can persist for a few seconds, minutes, or even hours, depending on the cause.[4] One illness that causes persistent dizziness for more than one day is vestibular neuritis. For instance, brainstem transient ischemia episodes can cause symptoms of postural vertigo.

Dizziness and vertigo precipitating and aggravating factors include: vestibular neuritis, which can cause symptoms to appear while the

patient is at rest; bilateral vestibulopathy, which occurs when the patient walks; and vestibular paroxysm, which is caused by rotating the head to either of the sides. Vertigo generally affects the older age groups like 70 to 80 mainly 65+ but nowadays younger generation including 30+ age groups are experiencing vertigo which is a result of their daily lifestyle.

If present, the concomitant symptoms, which include Menière's disease-specific bouts of acute tinnitus, hearing loss, and an ear pressure sensation, may come from the inner ear.[5] Symptoms of a central origin, such as nystagmus, sensory abnormalities, dysphagia, and immobility of the limbs, typically start in the brainstem. Although migraine, brainstem ischemia or posterior fossa haemorrhage can also result in same symptoms.[6]

### **Types of vertigo**

#### **Vestibular vertigo in the periphery**

Peripheral vestibular diseases are functionally divided into three primary categories, which based on their usual symptoms and indicators. Discussing the typical past, clinical findings, and therapeutic approaches for these typical forms of peripheral vestibular and the central vertigo in the sections that follow.

#### **Vertigo in a benign paroxysmal position (BPPV)**

The lifetime prevalence of this type of vertigo is less, and it primarily affects older patients. It's distinguishable by transient bouts of vertical placement nystagmus that beats towards the forehead and spin in the direction of lower ear.

Most of the cases are idiopathic; those that are still symptomatic are typically brought on by head injury. BPPV can also occur more frequently than regular following surgery, extended duration of the bed rest caused by other illnesses, or other medical procedures. Rarely, BPPV is brought on by the rotation of the head while lying on one's back. The reason BPPV is referred to as "benign" is because it typically goes away on its own. Although, it can continue for years.[2]

#### **Vestibular neuritis**

Persistent rotating vertigo and a tilt of axis in the direction of the labyrinth's affected side

Horizontal nystagmus that spontaneously rotates in the direction of the unaffected side, giving the sensation that the surroundings is moving. Changes in gait and an inclination to fall to the nausea side which is affected and diarrhoea malfunction of the canal on one side only.[7]

Although not yet confirmed, a disease cause by virus can be aetiology for vestibular neuritis which is likely to be a one cause. Autopsy studies have revealed vestibular ganglion cells to include the "latency-associated transcript", type I viral DNA. The method of treatment is symptomatic, therapeutic, and causal.

### **Central vestibular syndromes**

Lesions of the pathways, which start in the nuclei in the vestibular caudal part of the brainstem and moves to the cerebellum, and other brain regions, are the primary cause of central vestibular syndromes.[8] Lesions that are ischemic in the brainstem and migraine are two prevalent causes of central syndrome. Central vestibular disturbances can also happen during episodes of ataxia and migraine, as well as in the condition of some motor diseases including downbeat syndrome and upbeat syndrome.

### **Downbeat and upbeat nystagmus**

Both these syndromes (DBN, UBN), which are both termed to the order of the fast, beating phase, are two distinct types that are particularly significant. The most typical form of acquired, persistent nystagmus is DBN. Both forms primarily show up as swaying rhythmic eye movements, and only secondarily as oscillopsia, or the perception of motion in the surroundings as a result of oscillations in the retinal image. These two syndromes are kinds of fixation eye movements, which means that their potency rises with visual correction, in contrast to spontaneous rhythmic eye movements, such as that found in vestibular neuritis. These both syndrome consistently reveal the existence of a core disturbance and have unique localising relevance.[1]

### **Vestibular migraine**

Recurrent bouts of minutes to hours that typically include rotatory vertigo are the hallmark of vestibular migraine. It is the most

frequent reason for unprovoked vertigo attacks. It has a 0.98% lifetime prevalence. More than 60% of patients who experience these attacks also experience headaches, photophobia, or phonophobia; the remaining patients experience vertigo attacks on their own.[9]

### **Diagnosis**

The majority of frequent outcome of vertigo and the most common type is benign paroxysmal positioning vertigo, and many patients provide information that is sufficient for a phone diagnosis. Most often, bouts of BPPV linger for many weeks before spontaneously ceasing, only to recur several weeks, months, or even years later. BPPV affects people who experience recurring episodes of light-headedness more in elongated period of time without any other abnormalities.[9] The migration of errant small crystals of calcium carbonate particles within the duct of canal, typically the posterior, is the root cause of BPPV.

The placement test is the essential part of the diagnosis and, as of late, treatment. The goal of the test is to cause vertigo and nystagmus by moving any small crystals of calcium carbonate in the posterior canal. After some time, found that moving the otoconia into the duct also allowed for their removal, which also means that if the BPPV cannot be provoked, it cannot be treated.

Think about a patient who has BPPV in the left back of canal. The ampulla is lower in the posterior semicircular canal when one is seated, which is gravitationally vertical; any small crystals of calcium carbonate in the duct will be close to the cupula. The person is quickly pitched backwards with their head rotated to the left until it hangs. The small crystals of calcium carbonate will detach from the cupula and rest at the middle part of duct. They tug on the cupula as they fall away from it and causing a momentary episode of vertigo.[10] The wobble movement of eyes in BPPV often tends towards the inner ear, showing that the small crystals of calcium carbonate in the duct are moving in that direction. Lateral semicircular canal therapy is used in order for the otoconia to exit the canal, lateral canal BPPV, which is not so much dependent than posterior canal BPPV,

primarily entails rotating the affected person from the affected side to the unaffected side.

There are numerous causes for a person to feel unsteady or loosing balance while standing or moving around, a symptom that would refer to as "dizziness." Other diagnosis that are unremembered for the older age groups there is less preferable that only one diagnose can't explain the problem.

### **Diagnoses that are probable to be wrong**

When a person experience repeated solitary vertigo bouts, a clinical check-up, and no demonstrable loss of auditory or other central function, certain diagnoses shouldn't actually be made. Vertigo is not a symptom of acute otitis media but except if there is labyrinthitis.[13] Rarely, chronic otitis media can cause vertigo that results in a labyrinthine fistula. Most cases of perilymph fistula are most likely caused by the superior semi-circular canal dehiscing into the middle cerebral fossa.

The diagnosis of ischaemia is challenging and is probable to be accurate in a person whose bouts solely cause dizziness. Nevertheless, a patient might have a suspicion of it. A brief history of many mild vertigo bouts, occurring many times per day, must be able to raise the concern that the episodes are circulation ischemic attacks in the lack of any concurrent brainstem symptoms.[12]

### **Prevalence**

In the adult research, girls were more likely than boys to experience dizziness, and females has a separate higher risk for orthostatic light-headedness. In a study, the prevalence of vertigo—for all types of vertigo separately or together came about 18% to 20%, which is within the typical range for adult studies. Vertigo is higher in older age groups but mostly teenagers has experienced at least one episode of vertigo.

The study decreased prevalence is probably due to the removal of mixed symptoms and its focus on moderate and severe symptoms only. The prevalence which came to be 18% to 20% in the study are more than those in earlier research on students, indicating that the prevalence among teenagers is higher akin to that of adults.[9]

Additionally, estimation of the prevalence of certain types of vertigo are imprecise and have wide confidence ranges, which shows the limited number of smaller age groups who experience spinning vertigo.[8] However, potential ambiguities over how to categorize the vertigo kinds, found that vertigo differ significantly from one another.

### **Symptoms**

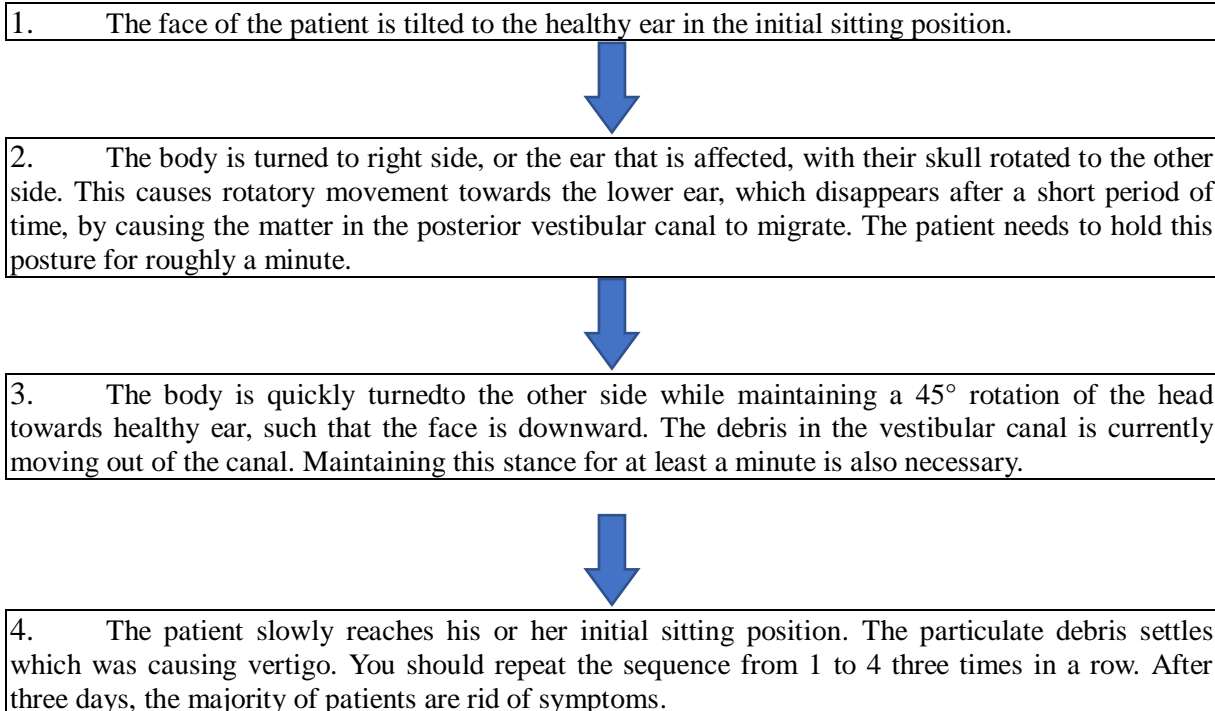
Vertigo causes can be distinguished using symptoms such as hearing loss, pain, nausea, vomiting, or neurologic issues. The biggest exception to this rule is a cerebrovascular stroke which involve the both artery and both of which causes vertigo with ear problems like loss of sense of hearing. Vertigo that is accompanied by pain can be caused by meningitis, invasive temporal bone disease, or acute middle ear illness. In majority of the cases of Meniere's disease and BPPV as well as acute vestibular neuronitis, vertigo frequently coexists with nausea or vomiting. Vomiting and nausea are usually less acute in central causes of vertigo. Other symptoms include the feeling of disorientation, headache, difficulty to stand without support, unsteadiness, feeling pressure in the head. Neurologic symptoms including ataxia, dysarthria, changed state of awareness, weakness, dysarthria, or other alterations are more likely to indicate the existence of a cause of vertigo such multiple sclerosis or a tumour.[15]

### **Treatment**

#### **BPPV**

Positioning techniques are used to cure BPPV. A quick change in head position can pass the agglomeration out of the canal, which prevents it from causing vertigo. The Semont manoeuvres is the preferred therapy. The Epley manoeuvre, which is similar to the Semont manoeuvre, rotates the patient while they are lying flat on their backs with their heads hanging down. After a limited training period, the majority of patients can do these manoeuvres on their own. In some of patients, the symptoms eventually return after effective therapy, although they can still be successfully treated a second time in the same way.[17]

Process of Semont manoeuvre for treatment of BPPV



### Vestibular neuronitis

Method of treatment is mainly treating the symptoms and therapeutic:

Antivertiginous drugs slow the growth of the brain's compensatory mechanisms, they should only be used for few days to treat the symptoms like severe nausea and vomiting. One example of such a drug is 100 to 300 mg of dimenhydrinate.

Treatment employed as a "causal" factor: In a trial, it was discovered that only with the methylprednisolone which is a type of glucocorticoid at a initial high dose daily, then decreasing the dose 20mg after every few days, dramatically accelerated the restoration of vestibular function.

The enhancement of central compensation by physical therapy is another treatment principle. Equilibrium training dramatically reduces the amount of time needed for postural control and vestibulospinal compensation to develop.[18] In addition to practicing movements of head to realign vestibular reflex, practicing exercise of eye and fixation helps to correct defective visual fixation. Other exercises include balance activities and goal-directed motions.

### Meniere disease

The two guiding concepts of treatment are:  
Treatment of specific attacks: Just like other acute labyrinthine dysfunctions, vertigo and

nausea can be alleviated with antivertiginous drugs. Suppositories containing 100 mg of dimenhydrinate are one example.

Attack prophylaxis: this course of therapy aims to treat the underlying endolymphatic hydrops. There is yet no treatment of this kind that has been unambiguously demonstrated to be effective. A proper diet which has no sodium, diuretics, gentamicin, betahistine, and surgical treatments are all recommended.[19] Both transtympanic gentamicin and elevated-dose treatment of betahistine hydrochloride have been shown to reduce the incidence of episodes. Based on a newly published observational treatment research with patients that received treatment for 1 year for different doses, the dose of betahistine dihydrochloride is now advised. The highest dose was well tolerated and reduced attack frequency by a statistically meaningful amount.

### Central vestibular syndrome and Downbeat and upbeat syndrome

The treatment for both of these syndromes is potassium-channel blockers amifampridine and 4aminopyridine that have been demonstrated to considerably make better this kind of diplopia. The dose is 10 mg twice daily, and an additional ECG is required.[20]



Pharmacological Treatment table

Vertigo types	Drugs	Dose
BPPV	Metoclopramide Promethazine	10mg IV or IM every 6-8 hr 12.5mg-50mg every 4-6 hr
Vestibular neuritis	Dimenhydrinate Chloropyramine	100-300mg daily 20mg 2-3 times a day
Meniere disease	Betahistine hydrochloride	48mg 2-3 times a day
Central vestibular syndrome and Downbeat and upbeat syndrome	4-aminopyridine	10 mg 2-3 times a day

## 2. Conclusion

For the majority of peripheral, central, and psychogenic causes of dizziness, there are efficient therapies accessible if the proper diagnosis has been made. Epidemiologic research shows that central factors account for roughly one-fourth of the patients' dizziness. Separating the peripheral and central causes usually requires consideration of medical history, neurological examination, and other examinations. Medication, physical therapy, and psychotherapy are all possible forms of treatment; in rare circumstances, surgery may also be necessary. The prescription of corticosteroids is the preferred treatment for acute vestibular neuritis. Medications used in treatment of BPPV are mainly used to cure the symptoms because BPPV resolves on its own.

## 3. References

- Cole, S. R., & Honaker, J. A. (2022). Benign paroxysmal positional vertigo: Effective diagnosis and treatment. *Cleveland Clinic Journal of Medicine*, 89(11), 653-662.
- Kutlubaev, M. A., Pal'chun, V. T., Guseva, A. L., & Zamergrad, M. V. (2021). Various types of vertigo and balance disorders in patients with Meniere's disease. *Vestnik Otorinolaringologii*, 86(1), 90-95.
- Stulin, I. D., Tardov, M. V., Boldin, A. V., Chugunova, M. A., Shurpo, V. I., & Mokhirev, M. A. (2021). Positional vertigo variant. *Zhurnal Nevrologii i Psikiatrii Imeni SS Korsakova*, 121(2), 88-91.
- Zwergal, A., Feil, K., Schniepp, R., & Strupp, M. (2020, February). Cerebellar dizziness and vertigo: etiologies, diagnostic assessment, and treatment. In *Seminars in Neurology* (Vol. 40, No. 01, pp. 087-096). Thieme Medical Publishers.
- Power, L., Murray, K., & Szmulewicz, D. J. (2020). Characteristics of assessment and treatment in benign paroxysmal positional vertigo (BPPV). *Journal of Vestibular Research*, 30(1), 55-62.
- Nada, E. H., Ibraheem, O. A., & Hassaan, M. R. (2019). Vestibular Rehabilitation Therapy Outcomes in Patients With Persistent Postural-Perceptual Dizziness. *The Annals of otology, rhinology, and laryngology*, 128(4), 323-329. <https://doi.org/10.1177/0003489418823017>
- Nada, E. H., Ibraheem, O. A., & Hassaan, M. R. (2019). Vestibular Rehabilitation Therapy Outcomes in Patients With Persistent Postural-Perceptual Dizziness. *The Annals of otology, rhinology, and laryngology*, 128(4), 323-329. <https://doi.org/10.1177/0003489418823017>
- Bouccara, D., Rubin, F., Bonfils, P., & Lisan, Q. (2018). Management of vertigo and dizziness. *La Revue de médecine interne*, 39(11), 869-874.
- Spiegel, R., Rust, H., Baumann, T., Friedrich, H., Sutter, R., Göldlin, M. B., ... & Kalla, R. (2017). Treatment of dizziness: an interdisciplinary update. *Swiss medical weekly*, 147(5152), w14566.
- Dommaraju, S., & Perera, E. (2016). An approach to vertigo in general practice.

- Australian family physician*, 45(4), 190-194.
11. Limburg, K., Sattel, H., Radziej, K., & Lahmann, C. (2016). DSM-5 somatic symptom disorder in patients with vertigo and dizziness symptoms. *Journal of psychosomatic research*, 91, 26–32. <https://doi.org/10.1016/j.jpsychores.2016.10.005>
  12. Langhagen, T., Albers, L., Heinen, F., Straube, A., Filippopoulos, F., Landgraf, M. N., ... & von Kries, R. (2015). Period prevalence of dizziness and vertigo in adolescents. *PloS one*, 10(9), e0136512.
  13. Newman-Toker, D. E., & Edlow, J. A. (2015). TiTrATE: a novel, evidence-based approach to diagnosing acute dizziness and vertigo. *Neurologic clinics*, 33(3), 577-599.
  14. Li, Y., & Peng, B. (2015). Pathogenesis, Diagnosis, and Treatment of Cervical Vertigo. *Pain physician*, 18(4), E583–E595.
  15. Wiperman J. (2014). Dizziness and vertigo. *Primary care*, 41(1), 115–131. <https://doi.org/10.1016/j.pop.2013.10.004>
  16. Strupp, M., Dieterich, M., & Brandt, T. (2013). The treatment and natural course of peripheral and central vertigo. *DeutschesÄrzteblatt International*, 110(29-30), 505.
  17. Bisdorff, A., Bosser, G., Gueguen, R., & Perrin, P. (2013). The epidemiology of vertigo, dizziness, and unsteadiness and its links to co-morbidities. *Frontiers in neurology*, 4, 29.
  18. Thompson, T. L., & Amedee, R. (2009). Vertigo: a review of common peripheral and central vestibular disorders. *The Ochsner journal*, 9(1), 20–26.
  19. Brandt T. (2009). AusdemGleichgewicht: LeitsymptomSchwindel [Out of balance: key symptom vertigo]. *Der Nervenarzt*, 80(8), 873–874. <https://doi.org/10.1007/s00115-009-2813-2>.
  20. Strupp, M., & Brandt, T. (2008). Diagnosis and treatment of vertigo and dizziness. *DeutschesÄrzteblatt International*, 105(10), 173.
  21. Halmagyi, G. M. (2005). Diagnosis and management of vertigo. *Clinical medicine*, 5(2), 159.