

A DETAILED REVIEW OF 1000 CASES OF VERTIGO

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ABSTRACT

INTRODUCTION

Vertigo is a sensorimotor and multisensory syndrome with various etiologies and pathogenesis, it is not a separate disease process. Early differential diagnosis between peripheral and central vertigo is of prime importance. Pharmacotherapy, rehabilitation, and surgical treatment are the main methods of treatment for vertigo.

In the acute phase of attacks, pharmacotherapy is the treatment of choice for vertigo. One of the most important methods of vestibular compensation support, required in vertigo treatment after the resolution of acute symptoms is rehabilitation. In patients where there is no improvement after pharmacotherapy, and in cervical, and vascular spine lesions and tumors, surgery may be required. Some patients with vertigo may require multidisciplinary cooperation for successful outcomes.

MATERIAL AND METHODS

1000 patients who presented with complaints of dizziness or vertigo from 2014 to 2019 in our Mehrotra ENT Hospital, Kanpur, India were taken for study. After proper history and examination, the patients were subjected to vestibular tests. A proper diagnosis was made after consultation with our neuro equilibrium department and the appropriate maneuver was done. Surgery was performed wherever required.

RESULTS

564 were females and 436 were males. Peripheral causes of dizziness account for the majority of dizziness cases with migraine forming the bulk of central cases. Out of 1000 cases, BPPV forms the most number of cases of vertigo accounting for 38.8% of all cases, followed by migraine (21.8%) and Meniere's disease accounting for 13% of all cases. 89.8% of cases were managed conservatively either through maneuvers, medications, and exercises. Rest 9.2% of cases were managed surgically. 0.4% were referred to neuro consultants. Appropriate diagnosis with suitable required maneuvers was key to proper management.

CONCLUSION

Close multidisciplinary cooperation is essential in dizziness. A well-established neuro equilibrium centre was key to our proper management of vertigo/ dizziness cases.

Keywords: vestibular disorder, vertigo, dizziness, Meniere's disease, migraine.

INTRODUCTION

The epidemiological data indicates 5-7% of patients are suffering from vertigo and balance disorders among all the patients who come to General Practitioners (GPs). These people are also estimated at 10-12% of the otolaryngologists' patients. Vertigo may be present in patients of all ages; however, becomes a more prevalent

complaint with the increasing age of patients. Among people above 65 years of age, vertigo is the third in the order of most common cause of visits to the doctor's office. Accurate diagnosis of the causes of vertigo is not an easy task but effective treatment steps depend on it. The first and most important step in the diagnosis of the patient with vertigo is a precise medical interview, next to questions about concomitant diseases and medications, getting information about the frequency and duration of symptoms, accompanying signs, and presence of triggering/alleviating factors. A well-conducted interview with the patient helps to clarify and detail the characteristics of such complaints, which often means something different for the patient and the doctor, despite using the same terminology. The doctor should determine if the patient reports vertigo, dizziness, lightheadedness, or pre-syncope. In balance disorders of the vertigo type the subjective sense of motion is dominating, most commonly of the type of the spinning of one's surroundings. This is accompanied by nausea, vomiting, or sudden sweating. The vertigo-type balance disorders should be differentiated from other types, such as:

• Dizziness, meaning the movement-related feeling of instability (e.g. while stepping up on a stool). Dizziness often accompanies vertigo, but can also appear independently. Dizziness and walking disorders appear in old age (disequilibrium presbyastasis).

- Lightheadedness is described as a stupor, blackout, or disorientation.
- Pre-syncope is the feeling of an upcoming swoon or collapsing with darkening sight or ringing in the ears, without losing consciousness.

According to the data published by Tacikowska and Kubieczk Jagielska, 50% of balance disorders are caused by pathology of the inner ear, 5% are caused by neurological disorders, 5% include orthostatic dizziness and adverse effects

of drugs, about 15% are psychological and psychiatric causes, and about 25% of vertigo and dizziness etiology is unknown[1]. Dizziness/vertigo may be of mixed character and several reasons can be present, especially in elderly patients. The most common causes of vertigo are benign paroxysmal positional vertigo, acute vestibular neuritis or labyrinthitis, Meniere's disease, migraine, and cervical migraine, as well as anxiety disorders. Less common causes include vertebrobasilar ischemia and benign or malignant ear tumors. Differentiating between peripheral and central vertigo is usually possible just after clinical examination of the patient, whereby further therapeutic decisions can already be made at the initial steps of diagnosis.

MATERIAL AND METHODS

1000 patients with complaints of dizziness or vertigo at our Mehrotra ENT Hospital, Kanpur, India were taken for study. Physical examination includes otoscopy and examination of the presence of nystagmus. We also perform easy neurological examinations known as cerebellar tests -the finger-to-nose test, the rapid alternating-movements tests for dystaxia and dysmetria (dysdiadochokinesia), and static and dynamic tests to assess the efficiency of posture and gait (Unterberger's stepping test and Romberg's test). Measurement of blood pressure and pulse rate in the supine, sitting, and standing positions (diagnosis of orthostatic hypotension) was also done.

In order to differentiate between peripheral and central vertigo, Dix Hallpike's maneuver was performed. This test induces vertigo or nystagmus in a person suffering from BPPV. Delay in the occurrence of vertigo and nystagmus (by 2-40 seconds), high intensity of the symptoms, and rapid recovery after about 60 seconds point to the peripheral localization of the cause of vertigo. No delay in the occurrence of vertigo and

nystagmus, the mild intensity of the symptoms, and their persistence of above 1 minute indicate the central disorders. The diagnosis of the central cause of vertigo is also supported by walking difficulties and the presence of other neurological deficits beyond balance disorders. Hypoacusis or tinnitus suggests the peripheral cause of vertigo[2,3]. In such a case extended audiological diagnostics were performed- pure tone and impedance audiometry, otoacoustic emission, and Brain Stem Evoked Response Audiometry (BERA). These tests allow for finding the location of hearing impairment and helping in further differentiation (e.g. of acoustic neuroma). The suspected presence of the acoustic neuroma must be confirmed by imaging examination- Magnetic Resonance Imaging (MRI). MRI is also the recommended method in the diagnosis of neurovascular conflict, multiple sclerosis, changes of vascular origin, meninges, and brain inflammation changes, and in the evaluation of cervical spine pathology. Supposing middle/inner ear pathology (congenital, inflammatory, neoplastic, and traumatic changes) -Computed Tomography (CT) of temporal bones was considered.

Our otoneurological laboratories were equipped for specialized tests such as Electronystagmography (ENG), Video nystagmography (VNG), static and dynamic posturography, Vestibular Evoked Myogenic Potentials (VEMP). ENG is an objective study based on the recording of eye movements (nystagmus) by the use of corner-retinal potential measurement. It contains 3 steps- oculomotor evaluation, positional testing, and caloric stimulation of the vestibular system. Comparison of the results of the following steps of the study helps to determine whether balanced disorders are peripheral (vestibular) or central. For more detailed observation and analysis of these eye movements Videonystagmography (VNG) was

used, to observe nystagmus with a sensitive, active infrared video camera[4]. Posturography is an objective Romberg test. It evaluates the vestibulospinal reflex, by registration of the Center of Gravity (COG) of the body movements. The moving COG of the body is a reflection of compensatory, postural movements, performed in the standing posture. Static posturography is performed by placing the patient in a standing posture on a fixed instrumented platform connected to sensitive detectors, which are able to detect the tiny oscillations of the body. Dynamic posturography differentiates from static posturography generally by using a special apparatus with a movable horizontal platform[4]. A new technique that allows assessing vestibulospinal reflex is to study the Vestibular Evoked Myogenic Potentials (VEMP). No response or prolonged latencies in VEMP indicate a failure in the reflex arc course. Incorrect record of VEMP is sometimes seen in Meniere's disease, acoustic neuroma, vestibular neuritis, and ototoxic vestibular damage.

For the vestibular exercises, patients are registered in our neuro equilibrium lab through the downloaded app, and all the exercise details

S.No	Cause of vertigo	Duration	Hearing disorders	Central/Peripheral
1	BPPV	Seconds	No	Peripheral
2	Vestibular neuritis	Days	No	Peripheral
3	Perilymph fistula (PLF)	Seconds	Yes	Peripheral
4	Meniere's disease	Hours	Yes	Peripheral
5	Labyrinth concussion	Days	Yes	Peripheral
6	Labyrinthitis	Days	Yes	Peripheral
7	Acoustic neuroma	Months	Yes	Peripheral
8	Ischemic causes	Seconds Hours	Not usually	Peripheral/ Central depending upon the site of ischemia
9	Migraine	Hours	No	Central
10	Cerebellar damage/tumors	Months	No	Central
11	Multiple sclerosis	Months	No	Central

are provided to the patient through the app.

RESULTS

- 564 were females and 436 were males.
- Peripheral causes of dizziness account for the majority of dizziness cases with migraine forming the bulk of central cases.

- Out of 1000 cases, BPPV forms the most number of cases of vertigo accounting for 38.8% of all cases, followed by migraine (21.8%) and Meniere's accounting for 13% of all cases.
- 89.8% of cases were managed conservatively either through maneuvers, medications, and exercises. Rest 9.2% of cases were managed surgically. 0.4% were referred to neuro consultants.

1. BPPV

Number of cases- 388(38.8%)

Treatment- Epley's Maneuver, Semont Maneuver, Barbecue Maneuver, Yacovino Maneuver.

2. Vestibularneuritis

Number of cases- 61(6.1%)

Treatment- Vestibular suppressant medications followed by vestibular exercises.

3. Perilymph fistula(PLF)

Number of cases- 36(3.6%)

Treatment- Surgery.

4. Meniere's disease

Number of cases- 130(13%)

Treatment- Medications(127 cases) and sometimes surgery(3 cases). Persistence of Meniere's disease symptoms despite the use of pharmacotherapy is an indication for surgical treatment. Those are transtympanic administration of drugs in the area of the round window (gentamicin, dexamethasone, lignocaine), fixing of the ventilation drain in the tympanic cavity for using pressure equalization system (Meniette Therapy-micropressure therapy), endolymphatic sac surgery (incision, decompression), creating an endolymphatic-perilymphatic fistula (PLF) or treatment causing damage of the vestibular organ surgically (selective vestibular neurectomy, labyrinthectomy) or chemically (aminoglycosides). The selection of an

appropriate method depends mainly on the level of hearing loss[5,6].

5. Labyrinthitis

Number of cases- 118(11.8%)

Treatment- Medical Management

6. Acoustic neuroma

Number of cases- 10(1%)

Treatment- Management of tumors of the auditory nerve depends on the measurement of the tumor, the age, and the general condition of the patient. In elderly patients burdened with comorbidities with high operational risk, usually the method "wait and scan" is used. Stereotactic radiosurgery is chosen in patients with tumors of more than 3 cm diameter. For smaller tumors, microsurgery is considered to be the safest method. Following operating accesses can be used: 1st - trans labyrinthine mainly used by otolaryngologists, 2nd - retro sigmoid (under occipital) - carried out mainly by neurosurgeons and used also to cut the vestibular nerve and vascular- nerve conflicts placed around the cerebellopontine angle, 3rd- by the middle cranial fossa in cases of small neuromas. These two last listed methods give the opportunity to save hearing[7].

7. Ischemic causes

Number of cases- 25(2.5%)

Treatment- Medical and surgical.

Vascular surgery may be required in certain cases of carotid pathology[5].

8. Migraine

Number of cases- 218(21.8%)

Treatment- Medical management.

There are three main aspects of migraine treatment: avoidance of triggering factors, acute symptomatic control, and pharmacological prevention. Recommendations should include the change in eating habits, and lifestyle,

performing vestibular rehabilitation exercises, and using pharmacological treatment. Changes in the diet include the reduction or elimination of aspartame, chocolate, caffeine, and alcohol. Medications like triptans or ergotamine are more effective if used early in an attack. Frequent use of these medications may result in medication overuse headaches, in which the headaches become more severe and more frequent. Pharmacotherapy used in the prevention of migraine attacks includes: as first-line- Beta blockers: metoprolol (50- 100 mg/day), flunarizine (5-10 mg/day), anticonvulsants: valproic acid (Depakine Chrono 500-800 mg 2 times a day) and topiramate (50- 100 mg/day, starts from 12.5 mg), and as second-line amitriptyline, venlafaxine, naproxen, bisoprolol. In the treatment of vertigo that occurs between attacks of migraine pain and also in prophylaxis, it is advisable to use medicines of the antivertiginosa group, e.g. betahistine or flunarizine in usual doses[7,8].

9. Cerebellar damage/tumors

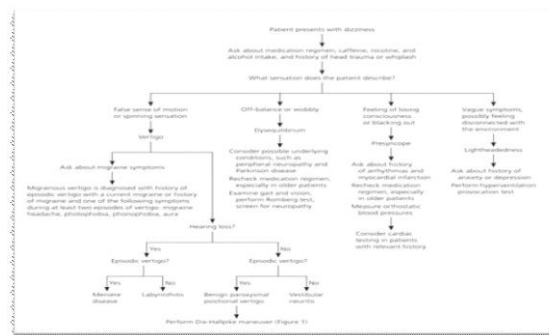
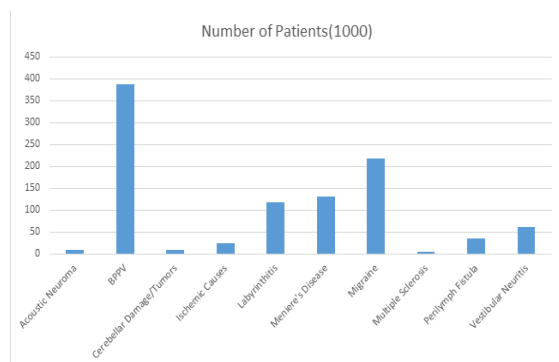
Number of cases- 10(1%)

Treatment- Neurosurgical treatment is chosen for other lesions such as hematomas, tumors, vascular lesions, and pathology of the cervical spine (cervical spondylopathy).

10. Multiple sclerosis

Number of cases- 4(0.4%)

Treatment- Neuro Management.



DISCUSSION

- Approach to a patient with dizziness

A special mention for BPPV treatment

Benign paroxysmal positional vertigo is caused by calcium debris in the semicircular canals (canalithiasis), usually in the posterior canal. Generally, medications are not recommended for the treatment of BPPV.

Vertigo improves drastically with head rotation maneuvers that displace free-moving calcium deposits back to the vestibule. Maneuvers include the canalolith repositioning procedure or Epley's maneuver[11].

Other maneuvers for BPPV performed at our centre are

• SEMONT MANEUVER

Step 1: ask the patient to sit up on a bed, with legs down.

Step 2: turn the head to 45 degrees to the right, and lie down to the left side, keeping the patient's head to the right. Wait for 30 seconds with the nose facing towards the ceiling.

Step 3: take the patient to the other side within 3 sec on the right side, now nose should be down towards the bedside.

Step 4: wait 30 seconds then take the patient again on the sitting position.

- **BARBECUE MANEUVER**

Step 1: Ask the patient to lie down on a bed in the supine position.

Step 2: Turn the head 30 degrees to the right and hold for 1 minute.

Step 3: turn head to the center position from the right side, wait for 1 minute

Step 4: Turn the head 30 degrees to the left and hold for 1 minute.

Step 5: roll over onto the bedside and the forehead should touch the pillow.

Step 6: turn the whole body to the right side, hold for 1 minute.

Step 7: turn the whole body to the center and ask patients to sit down.

- **YACOVINO MANEUVER**

Step 1: ask patients to sit down on a bed, with legs flat on the bed in front.

Step 2: hold the patient's head and take him down to 30 degrees from the supine position at the edge of the bed. Hold for 1 minute.

Step 3: take the patient up with his cheek to neck and take him sitting position with head down.

PHYSIOLOGIC VERTIGO

Motion sickness[12] is attributed to incongruence in the sensory input from the vestibular, visual, and somatosensory systems. Motion sickness occurs while riding in a car, boat, or airplane if the vestibular and somatosensory systems sense movement, but the visual system does not.

On the first sensation of motion sickness, efforts should be made to bring vestibular, visual, and somatosensory input back into congruence. For example, a person on a boat who starts to feel seasick should immediately watch the horizon[13,14]. Seasickness can be prevented by applying a scopolamine patch (Transderm-Scop) behind one ear at least four hours before boating.

CONCLUSION

Diagnostics and treatment of vertigo remain a challenge for many physicians. In this article reviewing the available literature guidelines about the treatment of vertigo were described. It is important to remember the possibilities of preventing attacks of vertigo in some patients. Rehabilitation should be recommended in most patients with both peripheral and central balance disorders. An important thing is a rational carefully planned pharmacotherapy, avoiding polypharmacy, individually adapted to the patient. An improvement in a patient with balance disorders after treatment does not release the doctor from determining the cause of symptoms. The need for interdisciplinary cooperation in difficult cases of balance disorders is underlined.

DECLARATION

Ethics approval and consent to participate: The study was approved by Organizational Ethics committee.

Conflict of Interests : The authors declare that there are no conflicts of interest.

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