VERTIGO –AN APPROACH TO A COMMON PROBLEM

Vertigo,(Dizziness) is among the commonest of chief complaints seen in office neurological practice.

It often presents a significant challenge to the attending physician, because the symptoms and signs are often vague and non-specific.

However, a robust systematic approach can usually arrive at the diagnosis.

Maintaining balance requires sensory inputs from the vestibular, visual, and somato-sensory systems and the cerebellum fine-tunes inaccurate motor outputs.

Disturbance in any of these pathways can cause vertigo. A common misconception id to attribute it to cervical spondylosis, well there is a condition; cervical vertigo (not related to spondylosis and will be discussed later).

Causes of vertigo are most commonly otological, followed by central, somatosensory, and visual.

The first question in approaching patients with dizziness is to categorise dizziness into one of the four groups:

- Lightheadedness,
- Pre-syncope,
- Disequilibrium,
- Lastly vertigo.

VERTIGO CAN BE BOTH CENTRAL AND PERIPHERAL AND HAS TO BE DIFFERENTIATED FIRST.

For peripheral vertigo, the most common cause is benign paroxysmal positional vertigo and should be specifically looked for. The tempo of the vertiginous attacks and other associated symptoms can help differentiate the other causes of peripheral vertigo, including Meniere's disease, vestibular neuronitis, labyrinthitis, and a perilymph fistula.

Central vertigo is commonly related to Strokes, tumors, Mutiple sclerosis, Migraine affecting vestibular apparatus.

APPROACH

HISTORY

Basic history of associated tinnitus, hearing loss and neurological symptoms are a routine.

- Hearing loss may be due to - otosclerosis, when a middle ear bone growth problem leads to hearing loss
- Ear surgery - perilymphatic fistula, when inner ear fluid leaks into the middle ear due to a tear in either of the two membranes between the middle ear and inner ear

Certain points in history commonly missed are:

- Headaches

Many people who experience migraine headaches may also have feelings of dizziness or vertigo - vestibular migraine (also called migraine-related vestibulopathy).The cause of this entity is not clear. This may be related to a person's inner ear, nerves, or blood vessels. Migraine can affect the vestibular system of the inner ear, which impacts the way the brain controls balance and the way a person experiences the space around them. When this system does not work properly, a person may experience feelings of vertigo, unsteadiness, or dizziness that can be triggered by movement. A person with vestibular migraine may also have a history of migraine headaches.

About 40% of people who suffer from migraine headaches also have vestibular symptoms. *However, a person can also experience vestibular migraine without headaches*. Vestibular migraine can cause a feeling that the ground is moving or falling, or cause problems coordinating movement. It can also impact the senses and distort hearing.

- Head injury – Not only this can cause traumatic inner ear damage but an entity to be remembered is post traumatic vertigo, a beningn condition, passes with symptomatic treatment in a week.
- Shingles in or around the ear (herpes zoster oticus).This can indicate involvement of 7^{th} cranial nerve in past, and since 7^{th} &5^{th} nerves are closely related centrally can give a clue
- Syphilis – An indicator of central cause
- Ataxia, leading to cuses related to CP angle pathology, cerebellar or brain stem disease

- A stroke or a transient ischemic attack, which people sometimes refer to as a mini stroke –can lead to transient hearing loss
- Multiple sclerosis
- Visual history
- Family history

Vertigo itself is not necessarily hereditary, but it is commonly a symptom of various conditions and syndromes.

Some of these appear to involve specific genetic factors and may run in families. If a person has recurrent vertigo, it may have a hereditary or genetic component.

Examples of conditions that can trigger vertigo and appear to involve genetic factors include:

- Familial episodic ataxia
- Migrainous vertigo
- Bilateral vestibular hypofunction
- Familial Ménière ‘s disease

- Pregnancy history

Vertigo in pregnancy

Nausea and dizziness are common problems during pregnancy. Hormonal changes appear to play a role, as they affect the characteristics of the fluid in the body.

Changes in fluid characteristics in the inner ear can lead to symptoms such as:

- vertigo
- instability with loss of balance
- tinnitus and hearing difficulties
- a feeling of ear fullness

A 2010 study surveyed 82 women during pregnancy. More than half of them reported experiencing dizziness during the first two trimesters, while one-third reported dizziness in the third trimester.

Nausea is common throughout pregnancy, but it tends to reduce as the pregnancy progresses. Many women in the survey linked nausea with dizziness. *Balance problems were also common, but these tended to worsen during the second and third trimesters*.

Hormonal changes bring about alterations in the inner ear during pregnancy. *As time goes on, the woman gets used to the new balance in the ear, and the symptoms of nausea and dizziness improve*.

The worsening of balance problems could be due to the changes in body weight and posture that occur during pregnancy.

Hormonal changes may lead to BPPV during pregnancy and that estrogen, specifically, may play a role.

But drugs for vertigo during pregnancy, specially on trimester basis should always be under medical supervision.

CLINICAL EXAMINATION

Thorough ear examination

External – Shingle etc

Middle & Inner – Rinnie & Weber test

Complete Neurological examination

Manoevres:

Semont Maneuver

- Sit on the edge of your bed. Turn your head 45 degrees to the right.

- Quickly lie down on your left side. Stay there for 30 seconds.
- Quickly move to lie down on the opposite end of your bed. ...
- Return slowly to sitting and wait a few minutes.
- Reverse these moves for the right ear.

EPLEY MANEUVER TECHNIQUE

The Epley maneuver is **designed to put the head at an angle from where gravity can help relieve symptoms**. Tilting the head can move the crystals out of the semicircular canals of the ear. This means that they stop displacing fluid, relieving the dizziness and nausea this was causing. This can be both diagnostic and therapeutic. But f therapeutically advised to do at home, the patient should be careful. AS the Epley maneuver at home, incorrectly can lead to: **neck injuries**.

Further there can be lodging the calcium deposits in the semicircular canals and making the problem worse.

Wait **for 10 minutes after** the manoeuvre is performed. This is to avoid "quick spins or brief bursts of vertigo as debris repositions itself immediately after the manoeuvre. Avoid driving yourself home if possible.

The url is given, one can check the manoeuvre by seen in the short video.
https://youtu.be/9SLm76jQg3g

THE DIX-HALLPIKE MANEUVER

This is a powerful tool in the clinician's resources and effort to distinguish one of the most common and benign presentations, from some potentially devastating alternative diagnoses that clinicians cannot miss.

The manoeuvre, when properly employed, can identify a common, benign cause of vertigo, which can then be treated with bedside manoeuvres, often providing instant relief to patients. This activity reviews the role of the Dix Hallpike manoeuvre for diagnosis of vertigo.

URL given to see the manoeuvre - https://youtu.be/8RYB2QlO1N4

Objectives:

- First to describe how the Hallpike manoeuvre is performed.
- Review the indications for the Hallpike manoeuvre.
- Explain the contraindications for the hallpike manoeuvre.
- Outline the importance of an inter professional team approach for the diagnosis of vertigo using the Hallpike maneuver.

Common causes of Vertigo

Vestibular neuritis

An infection causes vestibular neuritis, which is inflammation of the vestibular nerve. It is similar to labyrinthitis, but *it does not affect a person's hearing*. Vestibular neuritis causes *vertigo that may accompany blurred vision, severe nausea, or a feeling of being off balance*.

Labyrinthitis

This disorder can happen when an infection causes inflammation of the inner ear labyrinth. Within this area is the vestibulocochlear nerve.

This nerve sends information to the brain about head motion, position, and sound. Apart from dizziness with vertigo, *a person with labyrinthitis may experience hearing loss, tinnitus, headaches, ear pain, and vision changes*.

Labyrinthitis often results from a viral infection of the eighth cranial nerve or the labyrinth.

BPPV (Benign paroxysmal positional vertigo) – Commonest cause

Symptoms

The signs and symptoms of benign paroxysmal positional vertigo (BPPV) may include:

- Dizziness
- A sense that you or your surroundings are spinning or moving (vertigo)
- A loss of balance or unsteadiness
- Nausea
- Vomiting

The signs and symptoms of BPPV can come and go and commonly last less than one minute. Episodes of BPPV can disappear for some time and then recur.

Activities that bring about the signs and symptoms of BPPV can vary from person to person, but are almost always brought on by a change in head position. Some people also feel out of balance when standing or walking.

Abnormal rhythmic eye movements usually accompany the symptoms of benign paroxysmal positional vertigo.

HYPERTENION

The dizziness of very high blood pressure is described as vertigo (a sensation that the room is spinning).

Nausea, vomiting or loss of appetite: Nausea associated with severe hypertension can develop suddenly and may be associated with dizziness.

CERVICAL VERTIGO

This has nothing to do with age related spondylosis. However this term was coined in an article long back. Due to aging or other causes (trauma) etc, the positioning of the cervical

cord gets compressed or distorted. This then chiefly affects the posterior column, which gives a feeling of imbalance rather than actual vertigo.

INVESTIGAIONS

MRI (Vertigo protocol –so that the CP angles and cochlea can be seen accuratey)

Blood – A Thyroid assessment is mandatory

Vestibular function tests –(Depending on the dvice of Oto –neurologist).

Includes - Audiometry, Electronystagmograph, CCG - (Craniocorpography) is **a** *vestibulo-spinal function test* while ENG (electronystagmography) is a *vestibulo- ocular function test*- both these tests are routinely used in diagnosing peripheral and central vestibular lesions.

BAER –Braistem auditory evoked potential –may help in distinguishing the vertigo nature (central/peripheral).

Other computerised tests are now available too but should be done as per advice, not inadvertently.

Management

- First to diagnose the cause –peripheral or central
- Central causes needs management according to the cause

TREATMENT

Peripheral – Pharmacological and non-pharmacological

1] Pharmacological

- Acute – Dimenhydrinate, cinnarazine –short duration. Prochlorperazine, most commonly used, is unsafe as patients develop the habit of using it frequently and prolonged use can lead to extrapramidal problems (aggravation of parkinsonian like symptoms).
- Vestibular migraine – Usual treatment of migraine (Amitryptiline, betablockers, Flunarazine.
- Meinnier's disease – If properly diagnose it has to be treated ideally with Betahistine (high dosage,48 mg for at least 2 years)

- Benzodiazepines – These are helpful as anti anxiety measures as BPPV is so dramatic at times in its presentation that patients can be very anxious.
  They can normally be used for a short time 3-4 months till patients get adjusted to exercises and manoeuvres.
  However Clonazpam has an added role in suppressing vestibular nuclei and can be continued in small dose for longer periods.

2] Non- Pharmacological

- Vestibular adaptation exercises. However this has 4 components, lying, sitting, standing and walking. In each position there are exercises, though all are not required (some may even aggravate) –so should be learnt first from a neuro-physiotherapist first.
- Different manoeuvres as discussed above

- **Sleeping position**

- Many experts recommend that to **try and sleep on your back**, as the crystals within your ear canals are less likely to become disturbed and trigger a vertigo attack. If you happen to get up in the middle of the night, rise slowly as opposed to making any sudden movements with the head or the neck.

- **Diet**
- Food rich in sodium *like soy sauce, chips, popcorn, cheese, pickles, papad and canned foods* are to be avoided. Regular salt may be replaced with low sodium salt as sodium is the main culprit in aggravating vertigo

- **Rest**

- Medical advice for vestibular neuritis *is to avoid bed rest and get back to normal life as quickly as possible*. This kick-starts the brain into compensating for the vertigo so it doesn't become a long-term problem

SUMMARY

Hence from this short article, we can have a basic idea as well as certain misconceptions related to vertigo.

Before however reading the article, the candidate must have a basic anatomical and physiological idea about the pathways of peripheral as well as central, which lead to a co-ordinated symphony in auditory –visual –brain vestibular nuclei and henceonly can comprehend th article better.