

REVIEW ARTICLE

Vertigo in Elderly – Common but Complicated

N. S Neki^{1*}, Amritpal Singh¹, Gagandeep Singh Shergill¹, Amanpreet Kaur²

¹Department of Medicine, Government Medical College and Guru Nanak Dev Hospital, Amritsar-143001 (Punjab) India, ²Consultant Gynaecologist, Civil Hospital, Fatehgarh Sahib-140406 (Punjab) India

Abstract:

Dizziness and its subtype vertigo are common complaints occurring in all age groups after teenage but, it become a major health problem in elderly because of the frequency with which it affects the elder population and leads to direct and indirect consequences. Causes of vertigo in the elderly are not totally different from young population but to some extent they are different too. In elderly, the causation of dizziness and vertigo is interplay multiple factors, so its diagnosis and management differs from other age groups. This review is aimed at highlighting the special aspects of dizziness and vertigo in the elderly.

Keywords: Dizziness; Vertigo; Elderly

Introduction:

*“Around, around the sun we go:
The moon goes round the earth.
We do not die of death:
We die of vertigo.”*

– Archibald MacLeish

The incidence of dizziness, vertigo and imbalance is around 5-10% in all age groups taken together [1] but as might be expected, the picture is not homogenously coloured. The incidence of the dizziness and vertigo increases considerably in old age with overall prevalence increasing to more than 30% in age group of more than 60 years [2] and more than 50% in individuals older than 85 years [3]. In elderly, dizziness and vertigo show slight preponderance in females as compared to males [3] but the mean level of self-perceived disability, anxiety, depression and symptom

severity is not very different in any of the gender (so men are not strong either to face the probability of falling!) [4]. Compared to younger persons, dizziness in older people is not only more common but it is also more persistent, has more causes, is less likely to be due to a psychological cause, and is more incapacitating [5].

The dizziness and vertigo directly cause the impairment of the quality of life by putting the individual in constant “state of fear” of getting imbalance and danger of fall when alone and in social gatherings, along with it causes the elderly to be dependent and loose independency . The presence of dizziness and vertigo in the elderly is directly and strongly linked to the falls [6]. The incidence of falling is 25% in subjects older than 65 years [1], this is the group in which prevalence of dizziness and vertigo increases. A report using data from the Swedish National study on Aging and Care (SNAC) found that in patients younger than 80 years, the prevalence of falls was 16.5% and that of dizziness was 17.8%, whereas in patients older than 80 years, the prevalence of falls was 31.7% and that of dizziness was 31.0% [7]. Falls lead to fractures and injuries that increase the hospitalizations and further loss of independency. Dizziness and vertigo being the strongest contributors in disability burden in age group of more than 65 years [8]. More than this falls are also leading cause of accidental deaths in individuals older than 65 years age [9].

One more peculiar problem in elderly is of multiple factors playing in causation of dizziness and vertigo and associated co-morbidities present in elderly patients that accentuate the disability caused by dizziness and vertigo as we will see in next section.

Etiology:

The two main causes of dizziness and vertigo in older people are the ear (otologic i.e. peripheral or vestibular) and the brain (i.e. central). This brief review of the causes of dizziness is divided into five main categories: 1) otologic; 2) central; 3) medical; 4) psychogenic; and 5) unlocalized. There is little controversy regarding what is more common culprit - the ear or the heart. Most agree that vestibular causes are most common cause of the vertigo and dizziness in elderly similar to young population, only difference being is that these become more common in adults in overall. Peripheral vestibular dysfunction is currently thought to account for 48% of dizziness reported by older adults [10]. Benign Paroxysmal Positional Vertigo (BPPV) is most common etiology among otological as well as overall about one third cases of dizziness and vertigo in adults [11]. Bilateral vestibular loss, Vestibular neuritis, Meneier's disease, labyrinthitis are other important vestibular causes of dizziness and vertigo in elderly.

Dizziness and vertigo due to central causes is relatively less common than otologic dizziness. The central causes include cerebrovascular pathologies which become more common in elderly and which affect involving the cerebellum and brainstem in the form of stroke or cerebral atrophy. It may be a warning sign of dangerous associated conditions. Many other neurologic disorders may cause vertigo by disruption of the brainstem/cerebellar pathways due to space occupying lesions or degenerative diseases like

multiple white matter lesions (periventricular leukomalacia), Parkinsonism and related syndromes [3].

Although it is uncommon for seizures to present as dizziness, 'epileptic vertigo' [13] deserves a special mention because it responds well to treatment with anticonvulsant medication. Historical clues include a history of very brief spinning sensations or "quick spins". The patient may also have a history of loss of consciousness.

Fortunately, dizziness caused by vertebrobasilar migraine and migraine overall in mid-adulthood, is much less common as a new onset disease in the elderly, most patients of migraine usually have their first attack before the age of 40 years [13]. New onset in elderly is associated with no aura and is associated with increased risk for cerebrovascular events in elderly [14]. Although migraine is less prevalent in older than in younger age groups, the absolute increase in the number of subjects in older age groups may lead to an increase in the total number of migraine patients. Consequently, more elderly migraine patients may seek medical attention [15].

As elderly are usually on some kind of medication, and many of the drugs are notorious for causing dizziness by different mechanisms, so review of medicine many times brings out the causative agent. Common medicines implicated include ototoxic and vestibule-suppressive drugs like aminoglycosides, furosemide; drugs with anticholinergic effects like amitriptyline, meclizine; psychotropic agents like sedatives (barbiturates and benzodiazepines) and drugs with extrapyramidal side effects (e.g. phenothiazines) and antidepressants like SSRIs; antihypertensives with postural hypotension a side effect like propranolol, terazosin, calcium channel blockers, anticonvulsants like phenytoin, carbamazepine [16].

Proprioceptive problems like sensory loss in the feet and autonomic neuropathy due to diabetes, B12 deficiency, cervicogenic dizziness, or just peripheral neuropathy may contribute to unsteadiness in the older population.

Psychogenic causes are not that common but when present they can be very difficult to be labeled as the cause of vertigo as many morbid conditions those may be causing dizziness and vertigo are also present in such patients. Secondly, in elderly leaking out of the news of “psychogenic cause” can cause a lot social problems especially in Indian setup where elderly are usually dependent or living with their “adult children.” This way, it becomes sometimes a real dilemma for the physician in making diagnosis in the view of socio-psychological effects that can follow after such a diagnosis reaching to the attendants of elderly.

Pathophysiology:

With advancing age, age related degeneration affects the vestibular system locally i.e. vestibular receptors and its central & peripheral connections including afferent & efferent vestibular pathways, cerebellum, visual and proprioceptive input pathways. Along with this, the muscular strength decreases, muscles become lax which increases the instability of the joints added to which osteoporotic bones increases the propensity of not only falls, but also increased morbidity & mortality from the falls. Falls as we already seen are directly linked to vertigo and dizziness, 30% of people over 65 years and 39% of these people fall because of their dizziness [17].

In inner vestibular system, the number of receptor cells in the vestibular organs and of nerve fibers in the vestibular nerves decrease with advancing age [18, 19]. These age-related deficits affects most the semicircular canals, saccule and utricle

affected less [20, 21]. There occurs asymmetry of the perception of angular rotation in old age [22]. Visual acuity is also decreasing with age, this combines with loss of ability to compensate by head movements and inability to keep the retinal image fixation with rotatory movements [23]. All these factors lead to impaired vestibular and visual inputs producing an unsteady feeling and any asymmetry in the process produces dizziness and vertigo. There are also changes that increase the number of canaloliths, this leads to increased incidence of BPPV in elderly. Any insult to vestibular system produces effects at lesser threshold. These changes are usually not very rapid to cause acute rotatory vertigo; rather they can result in observed lack of rotatory vertigo even in BPPV [24].

Also, the compensatory mechanisms to fill the gaps created by vestibular loss are weakened in this age group, so impairment after vestibular neuritis or other insult is more pronounced in elderly [25]. Behind this lies the degeneration of multiple non-vestibular subsystems. The neuronal density in vestibular nuclei [26], Purkinje cells in cerebellum also show decline with age [27]. Proprioception inputs about joint position and movements, vibration and touch, all deteriorate with age [2].

Diagnosis:

Reaching at the appropriate diagnosis is obviously the first step towards the appropriate management. Patients with dizziness and vertigo can present to physician, neurologist or otolaryngologist, but whatever the specialty may be, it requires considerable skill to diagnose dizziness and vertigo. History is always an important component of diagnosis but in elderly, the history of dizziness and vertigo is not usually specific and description of symptoms can be

vague and inconsistent [28]. Moreover, there may be multiple factors underlying the symptoms in elderly, so specific symptoms to a specific disease entity may not be there in history [29]. Having said still that, the importance of history cannot be belittled.

Clue to BPPV can be found on history of attacks of “spins” on positional changes. This can be confirmed by Hall-Dixpike maneuver; in patients where the positions of this maneuver are not possible, side-lying maneuvers are helpful. For the Dix-Hallpike test, the estimated sensitivity is about 79% and specificity of 75%. For the side-lying test, the estimated sensitivity is 90% and specificity is 75% [30]. BPPV is commonly missed as diagnosis because in elderly rotator vertigo episodes may not be as severe as in young subjects and it can simply present as vague feeling of dizziness and disequilibrium so the patient can have repeated episodes of vertigo and dizziness and consume variety of medicines for a condition which is so easily treatable.

Migraine if there can be diagnosed on the basis of longstanding history. Meniere's disease can be identified on the basis of set of symptoms including hearing loss, tinnitus, vertigo and monoaural fullness [31]. Specific tests like pure tone audiometry can be used to confirm the diagnosis. Vestibular neuritis affecting vestibular apparatus as an isolated involvement can be diagnosed as usual, important here is to look for any systemic disease like diabetes causing widespread neuropathy of which vestibular neuritis can be a part. Review of all medication history and current medicines can easily bring out the diagnosis but it is usually not sufficiently detailed which causes missing out the diagnosis.

A particular difficulty arises when an elderly patient presents with acute onset of severe

dizziness or vertigo and the attending doctor has to rule out the possibility of stroke. The HINTS assessment protocol (it includes head impulse test, nystagmus directionality, and test of skew) can be performed at the bedside, with high sensitivity and specificity to diagnose stroke in such situations [32]. This three-point bedside examination has shown better sensitivity than early Magnetic Resonance Imaging (MRI) which can give a false negative result in vertebrobasilar stroke [33]; moreover MRI is not always readily available to all patients [34].

A full clinical examination including otolaryngological-neurological and ophthalmological examination is usually needed in a large proportion of elderly patients presenting with vertigo and dizziness to make full assessment of the equilibrium status of the patient. This is done by tests like nystagmography, vHIT, VEMPs, dynamic computed posturography. Testing for postural hypotension, joint position sense, and gait disorders can also contribute to assess non-vestibular components in a bedside low-cost manner, contributing to designing an integral but component-specific treatment [35].

Management:

Management includes simple elimination or 'retuning' of the offending drug, medications to control the symptoms and treatment of underlying etiology and rehabilitation of the patient.

BPPV is treated by Epley's manuevre is commonly recommended as treatment and cures most patients but this manuevre needs expert physician or otolaryngologist. If such facility is not available, then Brandt-Daroff exercises (Fig. 1) can taught to the patient to do at home. Five repetitions of these exercises should be performed each morning and evening for three weeks.

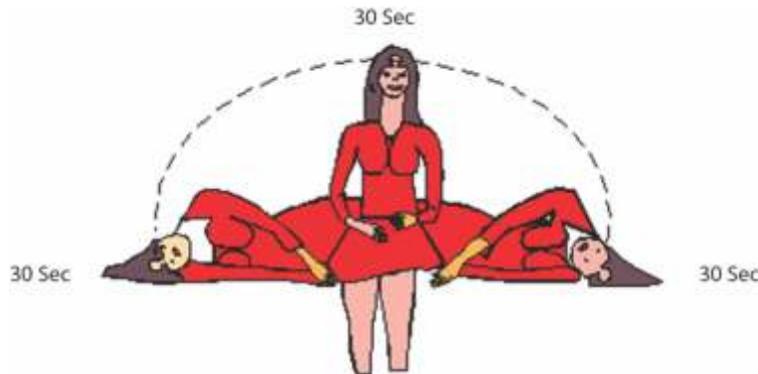


Fig. 1: To Perform the Brandt-Daroff Exercises, One Spends Thirty Seconds in each of the Positions Shown.

(Source - *Dizziness in Older People*, Timothy C. Hain, MD,
<http://www.dizziness-and-balance.com/disorders/age/Dizziness%20in%20the%20Elderly.htm>)

In the treatment of central dizziness, one must first attempt to address the cause. In the case of vascular events, for example, vascular risk factors should be treated. A patient with "quick spins" should have an electroencephalogram. Vestibular physical therapy is often helpful in this population.

Role of Physical Therapy in Managing Dizziness:

Rehabilitation in elderly is of much more importance than in young subjects. In young subjects, the duration of vertigo and dizziness is usually short and since there are no underlying comorbid conditions, young patients recover fully and there is no need of rehabilitation normally but the situation in elderly is altogether different. In elderly patients, dizziness and vertigo are of chronic nature with superimposed chronic state of disequilibrium due to various factors discussed above. So, rehabilitation is important and essential part of management of vertigo and dizziness in the elderly. Physical therapists are the

practitioners of choice in the rehabilitation and management of vestibular-related balance disorders [36] because they can devise a unique treatment plan to eliminate or minimize dizziness and its consequences. Other targets of vestibular rehabilitation include reducing fall risk, screening for and correcting benign paroxysmal positional vertigo (often undetected in the elderly [37]), stabilizing balance, retraining the proprioceptive system, improving gaze stability, gait training, and enabling optimal function. Fortunately, aging does not adversely affect rehabilitation outcomes.

Conclusion:

In elderly, the dizziness and vertigo are not only the major culprit of morbidity and loss of independency, but these pose also peculiar problems in diagnosis and management. The correct understanding of the pathophysiology of aging of vestibular system and overall aging process is the key to the correct diagnosis and management in elderly patients.

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***Author for Correspondence:** Dr. N.S. Neki, Professor, Dept. of Medicine, Govt. Medical College & Guru Nanak Dev Hospital, Amritsar, Punjab, 143001 Email: drneki123@gmail.com, Cell: 09501029128