

HOW BENIGN IS BPPV IN THE ELDERLY?T. B. Rama Krishna¹, T. Dinesh Singh², Jyothi Rama Krishna³, G. Rakesh⁴, Usha Sree⁵**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: Geriatric population in India is rapidly increasing. According to one estimate the number of persons above the age of 60 years is 76.6 million in India. India as the second most populous country in the world, with elderly people constituting 7.7% of total population. The morbidity in this age group is often due to increased incidence of falls. It is often preceded with spells of dizziness and often associated with vestibular disorders. Peripheral vestibular disorders often difficult to evaluate at the time of fall and only realized after the fall. Peripheral vestibular disorders like Benign Paroxysmal Positional Vertigo (BPPV), Vestibulopathy, Vestibular Neuritis are some of the disorders that affect geriatric population that affect the functional ability in 'activities of daily living (ADL)'. BPPV has been frequently found to be more common with advancing age. One simple test to assess ADL (Activities of Daily Living) is TUG test (Timed Up and Go). A score of 11.1 seconds or more on TUG test was correlated with 80% chance of a fall in the elderly. Hence a study is undertaken to evaluate peripheral vestibular disorders in elderly with special reference to BPPV along with their performance on TUG (Timed Up and Go) test. Benign Paroxysmal Positional Vertigo (BPPV) has been found to be most common vestibular disorder in the elderly. One out of four elderly with Peripheral vestibular disorder has a risk of 'fall'. BPPV is the most common peripheral vestibular disorder leading to 'risk of fall' three times more among the elderly after 75years.

KEYWORDS: BPPV, Positional Vertigo, TUG test, Risk of Falls, Balance, ADL, Dizziness.

INTRODUCTION: Approximately 7.7% of total population of India are above 65years of age. Main reason of ill health at this age is 'Falls' due to poor vision, joint disorders, osteoporosis, and neural disorders like Parkinson's disease. Those who have two falls in a year are called 'Frequent fallers'. The morbidity associated with a fall often results in disability of movement which results in restriction of activities of daily living. It is suggested that vestibular disorders with 'spells of dizziness' often lead to a fall. However true nature of vestibular disorder does not get recognized immediately. Screening Programmes to identify those at risk of falls comprise an assessment of gait and balance.^(1,2) The assessment of disability in elderly is done with a test popularly known as TUG (Timed UP and GO) test. It was originally 'get-up and go' test by Mathias and colleagues⁽³⁾ used a subjective rating scale. This test was later modified by Podsiadlo and Richardson, who developed a scaling system based on the observer's perception of the patient's fall risk.⁽⁴⁾ The 'TUG (Timed Up and Go) test is essentially an objective test and found to be correlating well with physical and mental abilities of the person and closely follows the Quality of life assessments in the elderly. A faster time indicates a better functional performance and a score of ≥ 13.5 seconds is used as a cut-point to identify those at increased risk of falls in the community setting.^(5,6) The test is simple to perform and proved to be reliable indicator of health status. In this test, an elder adult is asked to ambulate, rise from a chair, walk 3meters, then turn around, walk back to the chair and sit comfortably. The entire time taken to perform the task is measured in seconds by an observer. The ageing process affects all

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reflex mechanisms controlling posture that includes vision, vestibular control, muscle tension, range of movement and central coordination. In a study on elderly adults, a time of 11.1 seconds or more is often associated with risk of fall when associated with vestibular disorder.⁽⁶⁾

In our institute of tertiary care, a study has been undertaken with the following objectives:

1. To know the incidence of BPPV in the two sets of elderly (65-74 years, 75 years and above) who have spells of vertigo.
2. To assess the number of elderly who are at 'risk of fall' in each set due to BPPV.

METHODOLOGY: All the patients of 65 years or more age attending Department of ENT at our institute have been included in the study in a period of 18 months. The patients with head injury or diminished vision or dementia are excluded from the study. Those who had undergone ear surgeries earlier are excluded as well as those who used Aminoglycoside ototoxic drugs. The TUG test has been performed in the regular way with a Medical attendant and Audiologist.

The test was carried out in the out-patient department in a hall of 15 feet. Floor line and end of three meters were marked. A digital-watch is arranged to calculate the time precisely. Two trials were given to assess whether the patient followed instruction clearly or not. Then actual test time was calculated. A bed was placed in close vicinity in the hall to facilitate patients for lying down, in case of fatigue or spells of dizziness. Pre and Post-test recording of Blood-pressure were done and monitored.

The patients with history of dizziness, light-headedness, aural fullness or imbalance are subjected to thorough ENT Clinical examination, Neuro-otological tests (Head shaking test, Head-Thrust test and Spontaneous nystagmus, Dix-Hallpike test). All the patients with history of vertigo underwent investigations of audiometry, ENG, and VEMP (Vestibular evoked Myogenic Potentials). A neurologist opinion sought wherever a central pathology was suspected and relevant investigations (MRI Brain) carried out. ENG recordings were analysed for Hypo function or canal paresis. VEMP recordings were analysed to assess saccular hypo function or paresis.

RESULTS: The total number of elderly subjects in the study were 107. The sex ratio and age distribution were given in the table I. Sixty two patients have spells of vertigo with remaining group forming control group where TUG test has been conducted to formulate normative data. Eight patients were referred to Neurology in view of central disorders and excluded from the study. The results of Dix Hallpike test with Positive Nystagmus were tabulated in Table II. Approximately 47% of elderly showed BPPV with more than half cases falling in the age group of 65 years to 74 years.

Results of TUG test in Elderly with and without dizziness are given in Table III.

The average time to perform TUG test in the elderly group of 65-74 years was 8.4 secs, where as it was 9.2 secs in the 75 years and above. The overall performance on TUG test varied between 10.6 to 11.3 seconds in the elderly with spells of dizziness.

Table IV shows the results of TUG test score in seconds in the elderly with two criteria; one with score of 11.1 seconds and the other with 13.3 seconds (risk of fall is three fold).

DISCUSSION: Benign Paroxysmal Positional Vertigo, as name implies is sudden and typically occurs during change of position. Change of position like getting up from bed or toilet seat in the bath room

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are potential movements that trigger an attack of BPPV leading to a 'fall' which may result in cranial and /or long bone injuries of lower limbs. This eventually results in disability amongst elderly. The incidence of BPPV amongst 62 elderly with history of vertigo is 46% in our study. In a study by Bath and colleagues⁽⁷⁾ disorders of the vestibular system was found to be in the range of 40-50%, responsible for dizziness amongst elderly. The most common cause was BPPV in their study. In the study by Ramakrishna et.al,⁽⁸⁾ BPPV was leading cause of vertigo in the elderly. However Oghalai and colleagues⁽⁹⁾ observed only 9% of elderly presented with BPPV in their series, with high risk of fall within 3 months. A Swedish study⁽¹⁰⁾ determined the incidence and concluded that BPPV is underestimated amongst elderly.

Our study showed no significant difference in the two age groups ie., 65-74 years(58.6%) and 75years and above(41.3%) in the incidence of BPPV. In the two groups of elderly, 29 out of 62 patients were found to be positive on Dix-Hallpike test. Thus there is overall incidence of 46.7% of BPPV amongst elderly with vertigo. Out of 29 patients, 17 patients are in age group of 65-74 years, whereas 40% of them are above 75years.

The Timed Up and Go (TUG) test is very specific test with good correlation of a person's ability in activities of daily living (ADL). It correlates well with functional ability and also acts as a marker to assess improvement in vestibular rehabilitation.⁽¹¹⁾ In our study, the normative data of 8.4 to 9.2 seconds amongst the elderly corresponded well with other studies.⁽¹²⁾ When applied in disease group, 14 patients of BPPV were outside the range of 11.1 seconds(Criteria set by Whitney et.al) on TUG test showing 48% of them are at risk of fall.

The first group (65-74years) have 5 out of 17 performed TUG test with scores greater than 11.1seconds. There were none in this group who exceeded 13.5seconds criteria. Whitney and colleagues observed that elderly who scored 13.5 or more seconds were found to have 3.7 times risk of falls in the previous six months.^(13,14) Taking into consideration 13.5 seconds as criteria, the second group of elderly (75years and above), Six out of twelve (50%) were found to have the scores, with enhanced risk of falls(3.7 times more).The probable explanation for this is multi factorial: a. Diminished vision b. Diminished spinal movements c. Diminished cognition. Thus incidence of BPPV, though lesser after 75 years, it has 3 times more risk to make the elderly to fall. It appears that every alternate elder with BPPV after 75 years of age is likely to have high risk of a fall.

CONCLUSION:

1. BPPV is common amongst elderly.
2. One out of four elderly with h/o dizziness is likely to have BPPV
3. Risk of fall from BPPV above 75 years age is real and three fold.
4. All elderly should undergo routine Dix-Hallpike test after the age of 75years.

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Total Number: 107	Male (69) Female (38)	
Without vertigo: 45 (42.1%)	26	19
With spells of dizziness: 62 (57.9%)	43	19
Table I: Number of patients with and without dizziness		

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Dix and Hallpike test positive	29(46.7%)
65-74 years	17(58.6%)
75 years and above	12(41.3%)

Table II: Number of patients with BPPV with Positive Dix-Hallpike Test

Age group	65 -74 years (84)	75 and above (23)
Without dizziness (N:45)	8.4 ± 0.8 seconds(N:34)	9.2 ±1.2seconds(N:11)
With dizziness (N:62)	10.6±2.1seconds (N:50)	11.3±1.6seconds (N:12)

Table III: Time in seconds during TUG test

Benign Paroxysmal Positional vertigo (BPPV) N:29	TUG test score Exceeding 11.1 seconds	TUG test score Exceeding 13.3 seconds
65-74 years (N:17)	5 (29.4%)	Nil
75years and above(N:12)	3(25%)	6(50%)

Table IV: Results of TUG test in seconds in the two groups of elderly

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