PREVALENCE OF BALANCE ALTERATION IN GERIATRIC POPULATION USING BERG BALANCE SCALE

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ABSTRACT

Introduction: Balance is defined as the ability to keep the body’s centre of mass within the limit of the base of support, and it is required for many functional activities of daily life such as mobility & fall avoidance. Balance impairment occurs in up to 75% people aged 70 years & older, assessment of balance abilities is important for the diagnosis of important potential. Evidence health based care requires the use of valid reliable test during clinical assessment. Although impairment in balance is acknowledged as a major predictor of falls, systematic reviews have been limited in recommending specific clinical assessment scales of balance. Geriatrics is a branch of medical science which deals with the care of old people. Old age changes are called senescence.

An ability to predict risk of further falling is needed in order to target high risk individual for prevention and intervention.

Materials and Methods: The subjects both male and female between the age group 60-75 years were recruited for the study. For study research, 50 subjects were selected; and were divided among three age groups i.e. 60-65, 65-70, 71-75, and checked which age group was prone for balance alteration. Berg balance scale is used to measure the balance alteration. Berg balance consists of 14 items primarily assisting transfers and static standing balance, with limited dynamic activities. It takes approximately 15-20 minutes to complete berg balance scale. Items are rated on a 0 to 4 scale based on performance quality, performance duration and assistance needed, with a total range of 0 to 56 according to score interpreted. The total maximum score is 56 interpreted accordingly to the subject score.

Results: The results showed that the ANOVA test P value (<0.001) is significant.

Conclusion: It was found that as the age increases balance alteration and risk of fall also increases while berg balance score decreases. There is significance of prevalence of balance alteration and risk of fall in geriatric population.

KEY WORDS: Berg balance scale, Geriatric population, Balances alteration.

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In elderly, falls often precipitate a series of events with catastrophic potential. The annual cost of the related injuries is estimated at more than $7 billion. Complaints of dizziness and disequilibrium increase with increased age. 65% of individuals older than 60 years of age experience dizziness or loss of balance often on a daily basis. Some degree of imbalance is present in all individuals older than 60 years. This is the result of generalized functional degeneration. Initially the imbalance is situational and manifests when rightening reflexes cannot meet the demands of a challenging environment such as slippery surfaces. As the functional degeneration progresses the imbalance occurs during everyday activities, independent ambulation becomes difficult and likelihood of falls increases. When the inability is constant the individual restore the use of cane a walker or wheelchair [8].

Good balance is an imperative skill for daily life that requires the complex integration of sensory information regarding the position of the body relative to the surrounding and the ability to generate appropriate motor responses to control body movement. Balance calls upon contributions from vision, vestibular sense, proprioception, muscle strength and reaction time [9]. Somatosensory inputs provide information about position of the body parts relative to each other and to the support surface. Somatosensory inputs are the dominant sensory information for balance when body is standing still on a fixed firm surface human seems to rely primarily on signals from pressure sensors in ligaments and tarso to maintain good balance [8]. Geriatrics is a branch of medical science which deals with the care of old people. Old age changes are called senescence. The old age 60 was generally seen as the beginning of old age. Most developed world countries have accepted the chronological age of 65 years as a definition of elderly or old age [10].

Balance disorder in the geriatric population are often a multifactorial condition, weakness in the core stabilizing muscles, altered muscle activation pattern, loss of proprioception and inability to control normal postural sway can all result in decreased balance in the elderly [11].

**MATERIAL AND METHODS**

Materials: Step, Chair, Stopwatch, Ruler.

Methodology: Survey based study is conducted comprising of 50 sample size. The subjects were from the laughing club centres, consisting of male and female both. Subjects were between 60-75 years. We have divided the population among three groups 60-65, 66-70, 71-75. The subject who were uncooperative and having another neuromuscular problem were excluded. The study duration was four months.

**Procedure:**

For study research, 50 subjects will be selected. According to the inclusion and exclusion, each patient was explained the purpose of the study and a consent form was given to be filled by the patient. If the subject is willing to participate in the study, we will go with the further procedure. We have divided the subjects among three age group i.e. 60-65, 66-70, 71-75, to find out which age group is more prone for balance alteration.

Berg balance scale: Berg balance consists of 14 items primarily assisting transfers & static standing balance, with limited dynamic activities. It takes approximately 15-20 minutes to complete & minimal space. Berg balance scale items are rated on a 0 to 4 scale based on performance quality, performance duration, or assistance needed, with a total range of 0 to 56 according to score interpreted, Total maximum score is 56, Interprets accordingly to the subject score. 41 to 56 = low fall risk, 21 to 40 = medium fall risk, 0 to 20 = high fall risk.

**Outcome Measures:** Functional scale: Berg Balance Scale.

The berg balance scale is generally considered to be a gold standard with good inter-rater: .98
and intra-rater: .99 reliability and good internal validity. [12].

RESULTS

Fig. 1: Showing the Gender wise distribution.

![Gender distribution graph]

**Fig. 2: Age group wise distribution**

**Fig. 3: Different age group mean and standard deviation.**

**VV et al 2013** studied “Assessment of berg balance scale is better capable of estimating balance alteration in elderly than posturographic balance assessment” and conclude that greater the age increase greater will be balance alteration and greater falls risk [13].

In june2013 intellectual disability medicine, department of general practice studied “Feasibility and outcomes of the berg balance scale of older adults with intellectual disabilities” and concluded that Berg balance scale, balance capacities decreased with increased age [14].

In geriatric physical therapy second edition, Thus aging is a continues set of time dependent process that generally mirrors chronological age but it is highly variable and individualize. Age may not correlate with the chronological age and more often reflex the loss of person’s capacity to maintain independence [15].

With increased age there is progressive loss of functioning of these systems which can contribute to balance deficits. Balance disorder represents a growing public health concern due to the association with falls and fall-related injuries. Falls presents one of the most series and costly problem associated with older adulthood. Falls can mark the beginning of a decline in function and independence and are the leading cause of injury related hospitalization in older people. One in three people over the age of 65 years who are living in the community experience at least one falls each year and 10-15%of these falls are associated with series injury. In economic terms, the direct and indirect costs associated with falls are large and will grow as the proportion of older people increases. Consequently, understanding age-related changes in the physiological systems imperative to balance is of utmost importance to prevent fall in older people and reduced the injury-related burden on individuals and society [16]. Sensory impairments particularly Vision and hearing impairment is common in aging presbycysis and presbyopia are considered normal change of aging, these sensory impairments are due to multifactorial aetiology’s such as chronic diseases (diabetes, hypertension) as well as exposure to excessive noise ultraviolet sun light and excessive tobacco.
use. Dual sensory impairments which are associated with depression, delirium falls, poor cognitive performance and mortality [17].

People lose bone mass or density, specially woman’s after menopause, foot arches become less increases pronounced, contributing to a slight loss of height, lipofuscin (an age related pigment) and fat one deposited in muscle tissue, muscle fibre shrinks, lost muscle tissue may be replaced with tough fibrous tissue, muscle are less toned and less able to contract because of changes in muscle tissue and normal aging changes in the nervous system. The risk of injury increased because of gait changes, instability, and loss of balance may lead to falls [18].

Miki fairley et Al studied that footwear alteration will lead to balance alteration and falls [19].

In Oct 2006 Brazilian journal of otorhinolaryngology “studied factors associate with chronic vestibular disorder concluded that” functional balance of elderly patients with chronic vestibular dysfunction assisted by berg balance scale is worsen when associated with advance age the older age range with increasing number of diseases associated with vestibular disorder, polypharmacy, recurrent falls, tendency of falls, central vestibular syndrome, daily dizziness , have compromised mobility and gait disorder [20].

Studied internal and external factor of fall and given recommendations orthostatic hypotension is treated by rising slowly from sitting. Post prandial hypotension is treated by evaluating the carbohydrate intake. Low back pain is treated by physical therapy. Muscle weakness is treated by strengthening exercises, Yoga. Balance problem is treated by falls specific examination, by giving supporting aids like walker and three-point cane. Falls are also avoided by lowering the bed height, raising toilet set and adding raling. Falls induced by medications required review of the medications especially Psychotropic. Fear of fall reduces the independence and required Alert Pendants and Alert Bracelets [21].

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