

PREVALENCE OF BALANCE ALTERATION IN GERIATRIC POPULATION USING BERG BALANCE SCALE

Gaurai Gharote ¹, Biradar Vijaykumar ², Ujwal Yeole ³, Praveen Gawli ⁴, Roshan Adikitte ⁵.

¹ Assistant Professor, TMV College of Physiotherapy, Gultekdi, Pune 411037, Maharashtra, India.

² Student, TMV College of Physiotherapy, Gultekdi, Pune 411037, Maharashtra, India.

³ Professor and Head, TMV College of Physiotherapy, Gultekdi, Pune 411037, Maharashtra, India.

⁴ TMV College of Physiotherapy, Gultekdi, Pune 411037, Maharashtra, India.

⁵ TMV College of Physiotherapy, Gultekdi, Pune 411037, Maharashtra, India.

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.

Address for correspondence: Dr. Gaurai Gharote, TMV College of Physiotherapy, Gultekdi, Pune 411037, Maharashtra, India. **E-Mail:** gaurai.gharote@gmail.com

Access this Article online

Quick Response code



DOI: 10.16965/ijpr.2016.162

International Journal of Physiotherapy and Research

ISSN 2321- 1822

www.ijmhr.org/ijpr.html

Received: 25-07-2016

Accepted: 31-08-2016

Peer Review: 26-07-2016

Published (O): 11-10-2016

Revised: None

Published (P): 11-10-2016

INTRODUCTION

Balance is defined as the ability to keep the

body's centre of mass within the limit of the base of support [1], it is required for many functional

activities daily life such as mobility & fall avoidance [2], balance impairment occurs in up to 75% people aged 70 years & older [3] & is common in people with musculoskeletal & neurological disorder such as arthritis & stroke [4,5] Assessment of balance abilities [6] is important for the diagnosis of important potential. Evidence health based care requires the use of valid reliable test during clinical assessment [7].

In elderly, falls often precipitates 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 increases with increased age. 65% of individuals older than 60 years of age experience dizziness or loss of balance often on 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 a situational and manifests when righting 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.

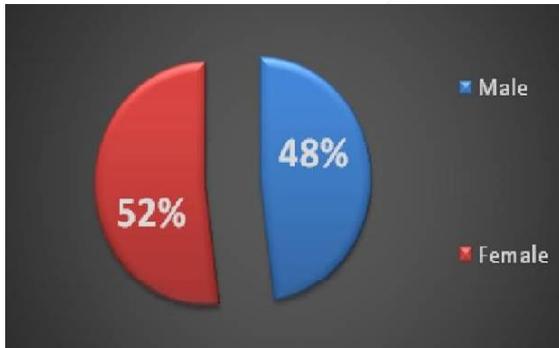


Fig. 2: Age group wise distribution

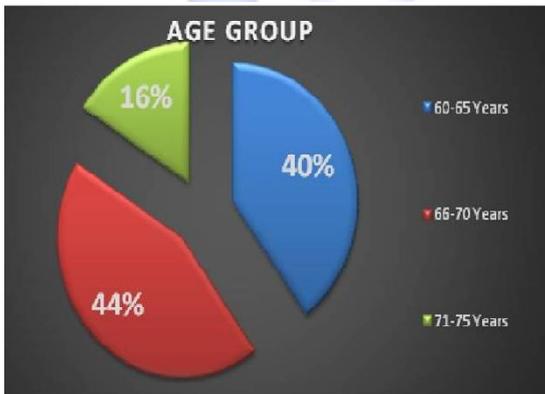
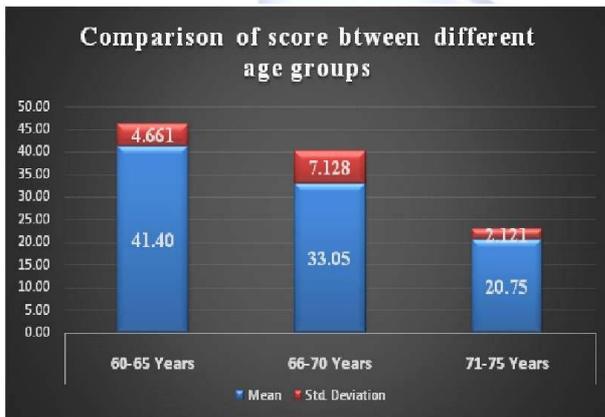


Fig. 3: Different age group mean and standard deviation.



DISCUSSION

This study presents important information that can be transferred directly to clinical practice to facilitate the identification of community dwelling older adults at an elevated risk for falling. As this population of older adults was high functioning, but having few functional limitations.

As the age increases the berg balance score decreases; balance alteration increases. Pereira

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 June 2013 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 continuous 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 presbycusis 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 loose bone mass or density, specially woman's after menopause, foot arches become less increases pronounced, contributing to a slight loss of height, lipofuscine (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 railing. 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].

ACKNOWLEDGEMENTS

We would like to acknowledge Mr. Deepak Tilak Sir for their continuous support and encouragement.

Conflicts of interest: None

REFERENCES

- [1]. Shumway-cock A, Woolcott MH. Motor control translating research clinical practice, 3rd edition. Philadelphia, PA: lip-pincott, Williams & Wilkins; 2007.
- [2]. Howe TE, Rochester L, Jackson A et al. exercise for improving balance in older people, continent database system Rev 2007: [4]:cd oo4963.
- [3]. Dillon CF, GUE, Hoffman HJ. KOCW. Vision ,hearing ,balance & sensory impairment in American aged 70yrs & older united state 1999-2006 NCHS data brief April 2010 [1-8]
- [4]. Tyson SF, Hanley M, Chillala J, Selley A, Tallis RC. Balance disability after stroke. Physical therapy. 2006 Jan 1;86(1):30-8.
- [5]. Sturnieks DL, Tiedemann A, Chapman K, Munro B, Murray SM, Lord SR. Physiological risk factors for falls in older people with lower limb arthritis. The Journal of Rheumatology. 2004 Nov 1;31(11):2272-9.
- [6]. Guide to physical Therapist practice, physTher, 2nd Ed 2001.
- [7]. Straus SE, Richardson WS, Glasziou P, et al, evidence based medicine to prevent fall age ageing 2006.
- [8]. Cloued P, Hobeika, MD. Equilibrium and balance in elderly , Ear, Nose and Throat . journal Aug 1990.
- [9]. D.L. St George, S.R. LORD. Balance disorders in the elderly. Neurophysiologie Clinique/clinical neurophysiology 2008;38(6):467-478.
- [10]. 19th edition, preventive and social medicines, writer-park and park, page no -475.
- [11]. Leipzig RM, Cumming RG, Tinetti ME, drugs and fall in older people a systematic review and meta-analysis: I psychotropic drugs, JAM Geriatric SOS 1999. 47: 30-33 Robbins AS, Rubenstein LZ, JOSEPHSON KR, Predictor of fall among older people; results of two population based studies, arch intern med 1989;147(7):1628-339. en. Wikipedia .org.
- [12]. Osullivan, S.B. and Schmitz T.J.(2007). Physical rehabilitation and treatment 5th edition page no -475.
- [13]. Pereira VV, Maia RA, Silva SM. The functional assessment Berg Balance Scale is better capable of estimating fall risk in the elderly than the posturographic Balance Stability System. Arquivos de neuro-psiquiatria. 2013 Jan;71(1):5-10.
- [14]. Intellectual disability medicine, department of general practice, Erasmus medical center Rotterdam, P. O. Box 2040, a. oppewal @erasmusmc.nl Res dev disability 2013 sep; 34(9). Epub 2013 jun 16.
- [15]. LaDORA V. THOMPSON, GUCCION Geriatric physical therapy second edition.
- [16]. Sturnieks DL, St George R, Lord SR. Balance disorders in the elderly. Neurophysiologie Clinique/Clinical Neurophysiology. 2008 Dec 31;38(6):467-78. Doi: 10 1016/j. Neucli .2008.09.001

- [17]. Cacchione PZ. Sensory Impairment: A New Research Imperative. Journal of gerontological nursing. 2014 Apr 1;40(4):3-5.
- [18]. Sed line plus (US) national library of medicine Robert Hurd MD Professor of endocrinology and health care ethics Xavier University Cincinnati, OH 9/15/2014.
- [19]. Restoring balance special consideration when training geriatric foot O and P EDGE Nov2013.
- [20]. JM Gazzola, MR Perracini, MM Ganança, FF. Ganança. Functional balance associated factors in the elderly with chronic vestibular disorder. Braz J Otorhinolaryngol., 2006;72(5):683-690.
- [21]. Balance problem in geriatric patients Dennis E. Enix DC, MBA. Joseph H. Flaherty, MD. Kaselysudkamp PT, DPT Jessica Schulz OT MOTR/L Topic in integrative health care 2011;2(1) ID 2. 1002 Published on March 30, 2011.

How to cite this article:

Gaurai Gharote, Biradar Vijaykumar, Ujwal Yeole, Praveen Gawli, Roshan Adikitte. PREVALENCE OF BALANCE ALTERATION IN GERIATRIC POPULATION USING BERG BALANCE SCALE. Int J Physiother Res 2016;4(5):1679-1683. DOI: 10.16965/ijpr.2016.162