

# GAIT IMPAIRMENTS AMONG ELDERLY POPULATION

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**Abstract:** *Introduction-* Gait disturbances and subsequent falls are among the major causes of chronic disability in the elderly population. A person's gait pattern is strongly influenced by age, personality and mood. Gait impairments may greatly affect the quality of life and restrict the personal independence of those affected. *Aims-* The aims were (i) to assess gait impairments in the elderly population. (ii) To investigate whether there is any gender differences in these impairments. *Methodology-* A sample of 100 subjects was selected from community, 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 study duration was four month. Then subjects were undergone screening for any cognitive impairment. After screening, all the subjects were assessed using dynamic gait index. *Result-* Out of 100 participants, more than half of the population (53%) had problem in gait pattern. In the study population 55 were females and 45 were males. Impairments were more common in females (65%) compared to male. *Conclusion-* It was found that as the age increases gait impairments and risk of fall also increases while DGI (Dynamic Gait Index) score decreases and according to this study females was more prone to these impairments.

**Key Words:** DGI, gait impairments, Gait disturbances.

## 1. INTRODUCTION:

Gait disturbances and subsequent falls are among the major causes of chronic disability in the elderly population. Walking is a common activity of daily living and at the same times a very complex one. It involves all levels of the nervous system and many parts of the musculoskeletal apparatus as well as the cardio respiratory system. A person's gait pattern is strongly influenced by age, personality and mood. Gait impairments may greatly affect the quality of life and restrict the personal independence of those affected. Moreover, balance and gait problems may be precursors of falls, which are the most common cause of severe injuries in the elderly. Walking is a sensitive indicator of overall health status and the self-selected walking speed closely correlates with individual life expectancy in elderly persons.<sup>1</sup>

The preferred walking speed in older adults is a sensitive marker of general health and survival. Safe walking requires intact cognition and executive control. Gait disorders lead to a loss of personal freedom, falls and injuries and result in a marked reduction in the quality of life.<sup>2</sup>

Falls commonly correlate with dizziness and may result in serious consequences and harm for elderly quality of life, increasing dependency. The functional limitations imposed by the symptom causes physical and psychological injuries and inability to perform daily and work activities. It is important for elderly people to be able to perform their daily activities, maintain functions, and retain their independence and autonomy. The association between falls and quality of life pointed to factors such as wellness, self-esteem, functionality, culture, ethics, religion, home environment, and health as key in determining quality of life.<sup>3</sup>

Gait disturbances can occur in elderly due to various factors such as weakness in the core stabilizing muscles, altered muscle activation pattern, loss of proprioception and inability to control normal postural sway.

## 2. OBJECTIVES:

The aims were -

- (i) To assess gait impairments in the elderly population.
- (ii) To investigate whether there is any gender differences in these impairments.

## 3. METHODOLOGY:

**Study type -** Survey based study.

**Sample Size -** 100

The subjects were from community, 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 study duration was three months.

**Materials-**

- Step,
- Chair,
- Stopwatch, and
- Ruler.

**Inclusion criteria:**

- **Sex:** Male and female.
- **Age:** 60-75.
- **MMSE Score:** normal cognition on mmse scale (above 24).
- Community elderly.

**Exclusion criteria:**

- The subject who were uncooperative and having another neuromuscular problem were excluded.
- Any Diagnosed case of psychiatric illness, and
- Any diagnosed case of cardiovascular instability.

**Procedure:**

For study research, a sample of 100 subjects was 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. All the subjects who were willing to participate divided among three age group i.e.60-65, 66-70, and 71-75, to find out which age group is more prone for occurrence of impairments in gait pattern. Then subjects were screened for their cognitive ability. After screening, all the subjects were assessed using dynamic gait index. Patients were also assessed by fall efficacy scale for the occurrence of falls.

**Outcome measure:**

- **MMSE.**
- **Dynamic gait index.**
- **Falls efficacy scale.**

**4. RESULT:**

Out of 100 participants, more than half of the population (53%) had problem with their gait. In the study population, 55 were females and 45 were males. Impairments were more common in females (56%) compared to male.

<b>Frequency of loss of balance according to gender. (n = 100)</b>		
	Male No (Percentage)	Female No (Percentage)
Gender	45(45%)	55(55%)
Gait problem	22 (49%)	31 (56%)

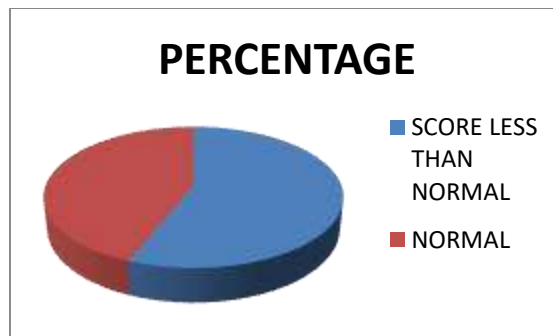
**TABLE 1.1- Frequency of loss of balance according to gender**

<b>Frequency of Associated factors amongst patients with gait impairments.</b>	
Associated factors	(n = Number) (Percentage)
Hearing impairment	20 (13%)
Sensory problem	15 (10%)
Vision impai.	25 (16%)

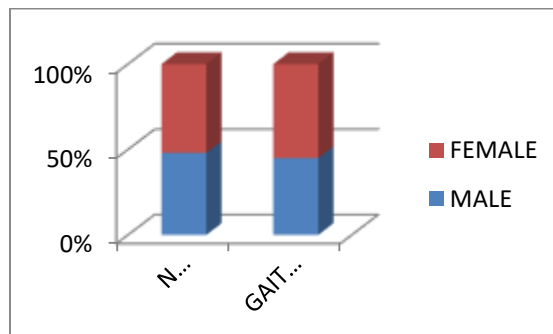
**TABLE 1.2- Frequency of Associated factors amongst patients with gait impairments.**

<b>Characteristic</b>	<b>Males (n = 45)</b>	<b>Females (n = 55)</b>
Height [cm], mean (SD)	172.6 (6.4)	159.5 (6.0)
Weight [kg], mean (SD)	82.8 (13.9)	71.2 (14.1)

**Table 1.3- Demographic Characteristics.**



**GRAPH1.1-Prevalance of gait impairment among elderly.**



**GRAPH1.2- Frequency of gait impairments according to gender**

## 5. DISCUSSION:

We conducted this study to presents important information that can be transferred directly to clinical practice to facilitate the identification of elderly population older adults at an elevated risk for gait impairments and falling.

We found a negative correlation between DGI score and age. Previous studies have reported that females are prone to accidental falls at a younger age than males because women reach their peak muscular performance earlier in life. Therefore, body functions, balance, and gait may decline earlier in women. In our study, we found that female are more prone to gait and dynamic balance impairment in comparison to the males. We also found a negative correlation between DGI score and age of subject, which indicates that as age increases, gait impairments and problem with dynamic balance, tends to increase.

Out of all the component of DGI, elderly population mainly faces problem in VI and II component i.e., keeping step over obstacle and speed walking respectively.

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<sup>5</sup>. There was a correlation between DGI score fall efficacy scale.

DGI is an effective tool to measure dynamic balance in individuals with brain injury.<sup>6</sup>

DGI was primarily developed to assess a subject's ability to modify gait in response to changing task demands. The eight abilities assessed are: steady-state walking, walking while changing gait speed, walking while moving the head vertically and horizontally, walking while stepping over and around an obstacle, pivoting during walking, and stair climbing. The items of the DGI are graded on a four point scale from 'normal performance' (3) to 'severely impaired' (0), yielding a maximum score of 24 points. The examiner's rating is based on the subject's ability to maintain a normal gait pattern and pace, without deviating or stumbling. It takes approximately 10 minutes or less to carry out the DGI. A score lower than 19 points has been associated with impairment of gait and fall risk<sup>7</sup>.

## 6. LIMITATIONS OF STUDY:

- Small sample size.
- More specific measures can be taken to identify gait impairment.
- Lack o time.

## 7. CONCLUSION:

It was found that as the age increases gait impairments and risk of fall also increases while DGI score decreases. There is significant prevalence of gait impartments and dynamic balance problem and risk of fall in geriatric population.

**REFERNCES:**

1. Mahlknecht P, Kiechl S, Bloem BR, et al. Prevalence and burden of gait disorders in elderly men and women aged 60-97 years: a population-based study. *PLoS One*. 2013; 8(7):e69627. Published 2013 Jul 24.
2. Pirker W, Katzenschlager R. Gait disorders in adults and the elderly: A clinical guide. *Wien Klin Wochenschr*. 2016; 129(3-4):81-95.
3. Taguchi CK, Teixeira JP, Alves LV, Oliveira PF, Raposo OF. Quality of Life and Gait in Elderly Group. *Int Arch Otorhinolaryngol*. 2015; 20(3):235-40.
4. Herman T, Inbar-Borovsky N, Brozgol M, Giladi N, Hausdorff JM. The Dynamic Gait Index in healthy older adults: the role of stair climbing, fear of falling and gender. *Gait Posture*. 2008;29(2):237-
5. 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):1679-168.
6. Simon, T. A.; Harro, C. C. RELIABILITY AND VALIDITY OF THE DYNAMIC GAIT INDEX IN INDIVIDUALS WITH BRAIN INJURY. *Journal of Neurologic Physical Therapy*: December 2004 - Volume 28 - Issue 4 - p 180–181
7. Herman T, Inbar-Borovsky N, Brozgol M, Giladi N, Hausdorff JM. The Dynamic Gait Index in healthy older adults: the role of stair climbing, fear of falling and gender. *Gait Posture*. 2008; 29(2):237-4.