GAIT ANALYSIS OF YOUNG AND OLD
W. M. S. Johnson

ABSTRACT: The usefulness of the walking stick for the elderly persons was studied in 25 males of 18-25 years age group and 25 males above 60 years age group. The parameters used were stride length, single limb support time and increased width of base. An external aid in the form of a walking stick had improved the confidence of the elderly individuals, which can surely prevent a fall.

KEYWORDS: Gait cycle: stance phase: Swing phase: single limb support time: stride length: width of walking base.

INTRODUCTION: In the elderly persons, fracture is common due to fall especially in the upper end of femur. Falls in older individuals are a major public health issue because of the financial cost of surgery, rehabilitation and the human cost of associated pain and disability. Although osteoporosis predisposes to fracture, it is the fall that triggers it. Other probable cases can be due to loss of muscle mass, difficulty in maintaining equilibrium and also defective vision. An external aid in the form of walking stick may prevent a fall. But nowadays it has become a rare sight to see elderly persons carrying a walking stick. Therefore, this study was carried out to analyze the gait of the elderly individuals (age > 60 years) and to compare it with the younger individuals (age18 – 25 year). Exclusion criteria being persons suffering from musculo – skeletal disorders and other neurological defects.

MATERIALS & METHODS: The materials consisted of 25 males of 18-25 years age group and 25 males above 60 years. Following parameters were studied.

Width of Walking Base: The individual was to walk on damp loose sand and width of walking base was measured using a measuring tape. (Fig. 1)

Stride Length: The individual was asked to walk on damp loose sand and the distance between two consecutive contacts of the same foot was measured using a measuring tape. (Fig. 2)

Single Leg Support Time: The individual was asked to stand on one leg. The time duration of standing with one leg was observed using a stop clock.

The data of the observations were tabulated. (Table 1)

OBSERVATIONS: The width of the walking base was found to be increased in the elderly individuals when compared with the youngsters. (Fig. 3) The average width was 23.92 cms. In the elderly persons whereas it was 9.48 cms. In the youngsters (Table 1)
The stride length decreases as age advances. (Fig. 4) the average stride length was 58.62cms. In the elderly individuals whereas it was 81.76cms. In the youngsters. (Table 1)

The single leg support time was decreased in the elderly persons. (Fig. 5) the time was 20.56secs in the elderly persons whereas in youngsters, the time was 61.72secs. (Table 1)

With the support of the walking stick the single leg support time was decreased. (Fig. 6) the average time was 41.4secs in the elderly individuals and the younger individuals, the time was 126.08secs (Table 1)

**DISCUSSION:** Human gait is the most complicated one and coordinated series of movements involving both the upper and lower extremities. It is the translatory progression of the body by coordinated rotator movement of body segments. The sole purpose of walking is to transport the body safely with minimal energy expenditure.

The neuromuscular system provides necessary shock absorption, maintains balance and prevents collapse. Gait is a learned process and not a result of inborn reflex. A series of repetitive events were carried out whereby feet are picked up, swung forward, placed on ground, walked over and the cycle was repeated. This is known as the gait cycle. Each gait cycle consists of swing phase and stance phase. The contact with the ground. The swing phase provides the actual step which moves the individual. It is the non-weight bearing portion of gait cycle.

The single leg support had corresponded to swing phase of other limb and hence it could be responsible for the support of the entire body. The duration of single leg the entire body. The duration of single leg support is a measure of an individual's capacity to stabilize and support the body. The maintenance of equilibrium is challenged to the maximum in the time. To reduce the maximum challenge, the duration would have reduced in the elderly individuals.

Stride length is the distance between two consecutive contacts of the same foot. The reduction of stride length in the elderly individuals may be probably to reduce single leg support time.

The increase in the width of walking base with age may be probably to increase the area within which the centre of gravity would fall. All these factors substantiate that the elderly pederly people adjust their gait to prevent a fall.

Elderly persons show increased local instability or inability to compensate to the natural stride – to – stride variations present during locomotion.

Based on the age-related differences observed, we believe that the gait pattern alterations observed among younger and older adults reflect control set modifications to postural control that are mediated by a heightened anxiety.

Hence from this study, it is evident that an external aid in the form of walking stick helps to build confidence of elderly people and thereby reduces the risk of fall. But this useful hand tool is not utilized in its fullest capacity – may be the senior citizens.

Walking stick – is it thing of the past?

Do not want to reveal their ageing! If the usefulness is not understood and utilized many more will join us pondering whether walking stick is a thing of the past?
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<td>Single leg support time</td>
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<td>4</td>
<td>Single leg with additional support time</td>
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Table 1

Fig. 1: Width of walking base
Fig. 2: Stride length
Fig. 3: Width of walking base
Fig. 4: Stride length
Fig. 5: Single leg support time
Fig. 6: Single leg with additional support
REFERENCES:

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