



CORRELATION BETWEEN TIMED UP AND GO TEST AND QUALITY OF LIFE WITH LOCOMOTIVE SYNDROME AMONG COMMUNITY LIVING OLD AGE PEOPLE -AN OBSERVATIONAL STUDY

Karthikeyan M., Nithya.V and Sivakumar V.P.R

SRM College of Physiotherapy, SRM Institute of Science and Technology, Kattankulathur-603203

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ABSTRACT

Background: The term “Locomotive Syndrome” was introduced by Japanese Orthopaedic Association. They suggested that the locomotive syndrome was caused by musculoskeletal diseases to the elderly people. The musculoskeletal organ such as bones, joints and muscles weakening causes this syndrome. This study shows that locomotive syndrome affects the quality of life. **Objective:** To find the correlation between the timed up and go test and quality of life with locomotive syndrome among community living old age people. **Study Design:** Non- experimental design, observational type. **Procedure:** 124 subjects in the age group of 65-75 years of both genders were screened for Locomotive Syndrome using 25-Geriatric locomotive function scale (GLFS-25). Out of 124 subjects, 5 were negative for Locomotive Syndrome. Remaining 119 subjects who were positive for Locomotive Syndrome underwent Timed Up and Go test and Quality of life (QOL) was checked using SF-36 Questionnaire. **Results:** There is a significant difference between the timed up and go test and Quality Of Life with locomotive syndrome among community living old age people. **Conclusion:** This study concluded that significant correlation between the timed up and go test and quality of life with locomotive syndrome among community living old age people.

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INTRODUCTION

Aging is the accumulation of changes in an organism overtime or later part of animate life. In humans it refers to a multidimensional process of physical and social change. Some dimensions of aging grow and expand over time while others decline. The rate of mineralization slows down and vitamin D absorption also decreases and also decreased strength of the bone due to loss of bone tissues. Bone loss commonly seen in the aging and women have more rapid rate of bone loss than the men, with most rapid losses occurring in the 5 years following menopause and also the osteoporosis affects mostly women¹. The age-dependent decline in lean body mass is well known and is primarily due to loss and atrophy of muscle cells and the total number of motor units appears to decrease with aging and slower activity of motor units, loss of muscles and endurance². The central nervous system demonstrates many structural changes during the aging process. Mainly is a decrease in the number of neurons, and reduce speed of nerve conduction, and weight of the brain declines with age. The brain size and weight reduction occur in the area of cerebral cortex.

The sensory systems are hearing, vision, smell, taste, balance become less acute, the motor skills are challengeable in daily activity. The increase in elderly population has a great impact on public health, and it is important to understand the progression of musculoskeletal disorder seen in this population. With repeated bouts of acute exacerbation, more and more people are becoming concerned about the health problems of aging and also the chronic disease, trauma of the locomotive organs which also amount to locomotive syndrome³. The Japanese Orthopedic Association (JOA) introduced the term “locomotive syndrome”. This association suggested that, most of the elderly peoples are affected by locomotive syndrome due to musculoskeletal diseases. The locomotive syndrome is a condition of decreased in movement because of deterioration of locomotive organs. They also defined in another form i.e., any impairment in the locomotive organ declines the functional mobility such as sitting to standing or walking⁴. This syndrome will limit the independence of an individual in carrying out daily activities. Any weakening to the musculoskeletal organs causes the locomotive syndrome. Functional loss to these organs creates disability during walking and self carrying; this will lead to seek outside care and support for an individual with locomotive syndrome⁵. As medical field advances, there was a drastic increase in Life expectancy, so there is a increase in old age population throughout the world. In india, as the statistical reports say the average life expectancy has gone up by five

*Corresponding author: **Karthikeyan M**
SRM College of Physiotherapy, SRM Institute of Science and Technology, Kattankulathur-603203

years from 62 years for males and 63 years for females from 2001-2005 to 67 years for males and 69 for females from 2011-2015. So this increase have made we Physiotherapist to think on their quality of life⁶. So far no studies have targeted locomotive syndrome patients in Indian population. In so many countries lots of researches were done in locomotive syndrome and they were treated with balance and resistance training according to their needs which had improved their status of wellbeing⁷. This study is being done with the aim of assessing whether locomotive syndrome is present among the community dwelling old persons and level of presentation and checking it influence over their quality of life.

Aim of the Study: To find out the correlation between the timed up and go test and quality of life with locomotive syndrome among community living old age people.

Need for the Study: Locomotive syndrome is an evolving concept and still not many researches were done on it and a very few studies exist on Indian Population. This study is done to promote awareness among physiotherapist to better focus on the management on community dwelling old age people. Further more this study is aimed to throw light on the quality of life in the oldage persons with Locomotive syndrome. So far studies had been done on diagnosing Locomotive syndrome on symptomatic oldage persons like with knee or back pain. But this study has been done to have a wider check of the locomotive syndrome even in non symptomatic old age persons, thus will help in promoting awareness about locomotive syndrome among Physiotherapists and its influence over quality of life. **Methodology, study Design:** Non-experimental design. **Study Type:** Observational type **Sampling Size:** Convenient sampling. **Sample Size:** 119. **Study Setting:** Community hall, Guduvanchery. **Inclusion criteria** were, Age 65-75 years of both sexes. Ability to walk without assistance. Persons without any recent injury, persons who can answer questionnaires by themselves. Individuals who scored >16 points in 25 questions geriatric locomotive function scale. **Exclusion criteria** of the study were, those with severe cardiovascular, pulmonary and renal disease. Persons with psychological illness. Individuals with a past history of fractures of the lower extremities and spine within the preceding 6 months. Those receiving treatment for chemotherapy. Severe neurological disorder. [IVDP, Stroke, parkinsonism]. Recent surgery [past 6 month]

METHODOLOGY

Old age people between 65-75 years (early old age) living in the community were screened for locomotive syndrome using 25-geriatric locomotive function scale (GLFS – 25). Its consists of 25 items as well as 16 questions concerning daily activities during the last month, 4 questions concerning pain during the previous month, 3 questions about social functions, and 2 questions about mental health condition during the previous months. The validity and dependability of the geriatric locomotive function scale (GLFS-25) was established as acceptable for identifying locomotive syndrome with a cutoff score set at 16. A person isdiagnosed with locomotive syndrome if GLFS-25score is 16 points or higher⁸. The subjects who are positive for locomotive syndrome were scheduled with Timed up- and –go test.

Timed UP – And –GO(TUG) Test: It is the time taken for a subject to get up from a chair, walks a 3 meter distance and

turn approximately, walk back to the chair and sit down. Each subject performed the test twice, and the score was recorded. The timed up - and - go test are used to assessand measure the usual walking speed which has been recommended to evaluate physical function in community – dwelling elderly.

Quality of Life (SF-36 Questionnaire). The quality of life of the patients were measured using the short form-36(SF-36) which was validated and generally usedscale witheight dimensions of health-related to quality of life: (1) emotional well-being(2)general health (3)physical functioning (4)bodily pain (5)role physical/functioning (6)social functioning (7)role emotional/functioning (8)energy. The scores range from 0 to 100. In this 100 represents best possible health and 0 represents the poorest health status.³ The score was calculated by:

$$\text{Transformed scale} = \frac{(\text{actual raw score} - \text{lowest possible raw score})}{\text{Possible raw score range}} \times 100$$

Outcome measures of the study were, Geriatrics locomotive function scale 25 Questionnaire (GLFS-25). Timed Up and Go test. RAND Short Form- 36 Questionnaire.

Data Analysis

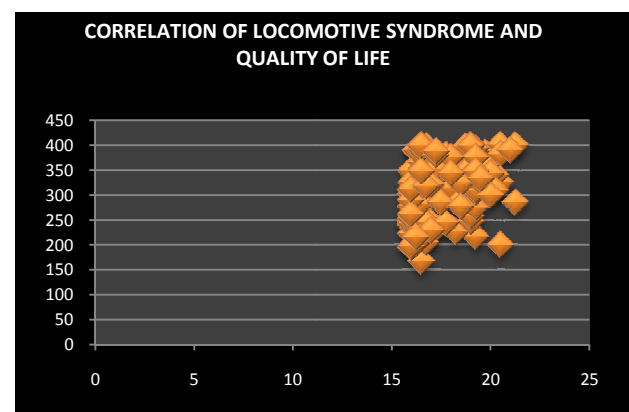
The collected data were tabulated and analyzed using descriptive and inferential statistics. Mean and standard deviation were used to assess all the parameters of the data using statistical package for social science IBM (SPSS) VERSION 20.

Table 1 Correlation Between The Locomotive Syndrome And Quality of Life Among Community Living Old Age People.

	N	Mean	Std. Deviation	Significant value
LOCOMOTIVE SYNDROME	124	17.7539	1.52063	0.01
QUALITY OF LIFE	119	321.926	58.40551	

p<0.05

This table shows the mean value of locomotive syndrome in (17.7539) and the mean value of quality of life in (321.926) there was a significant correlation between Locomotive syndrome and Quality of life which infers the Quality of life is influenced by the Locomotive syndrome among community living old people(p<0.05).

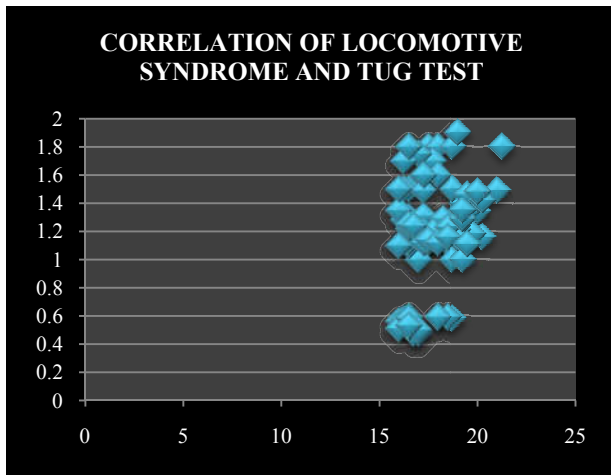


Graph 1 Correlation between the locomotive syndrome and quality of life among community living old age people.

	N		Mean	Std. Deviation	Significant value	
LOCOMOTIVE SYNDROME	1	2	4	17.7539	1.52063	0.01
TIMED UP AND GO TEST	1	1	9	1.1557	3.8059	

P<0.05

This table shows the mean value of locomotive syndrome in (17.7539) and the mean value of timed up and go test in (1.1557) there was a significant correlation between Locomotive syndrome and Timed Up and Go test which infers the mobility of the old age people with Locomotive syndrome is compromised(p<0.05).



Graph 2 Correlation between The Locomotive Syndrome And Timed Up And Go Test Among Community Living Old Age People.

RESULTS

Table 1 This table shows the mean value of locomotive syndrome in (17.7539) and the mean value of quality of life in (321.926) there was a significant correlation between Locomotive syndrome and Quality of life which infers the Quality of life is influenced by the Locomotive syndrome among community living old people(p<0.05). Table 2 This table shows the mean value of locomotive syndrome in (17.7539) and the mean value of timed up and go test in (1.1557) there was a significant correlation between Locomotive syndrome and Timed Up and Go test which infers the mobility of the old age people with Locomotive syndrome is compromised(p<0.05). Graph 1 shows that there was a significant correlation between Locomotive syndrome and Quality of life (p<0.05) which infers the Quality of life is influenced by the Locomotive syndrome among community living old people. The old age persons with Locomotive syndrome were found to have a poor Quality of Life than the persons without Locomotive syndrome. Graph 2 shows that that there was a significant correlation between Locomotive syndrome and Timed Up and Go test which infers the mobility of the old age people with Locomotive syndrome is compromised thus influencing their Quality of Life.

DISCUSSION

This study was aimed to find out the correlation between timed up and go test and quality of life with the locomotive syndrome among community living old people. In this study, 124 subjects in the age group of 65-75 years of both genders were screened for Locomotive Syndrome using 25- Geriatric locomotive function scale (GLFS-25). Out of 124 subjects, 5 were negative for locomotive syndrome, remaining 119

subjects were positive for locomotive syndrome. This study shows that there is a significant increase of GLFS – 25 score in subjects with a locomotive syndrome (p<0.05). This goes hand in hand with Akio Muramoto *et al* who stated that the geriatric locomotive function scale (GLFS) – 25 score has been significantly higher in subjects with locomotive syndrome and there is a correlation with the timed up and go test positively with GLFS – 25 questionnaire. Imagama S, *et al* in 2012 stated that an individual affected with locomotive syndrome can be measured by GLFS-25 which demonstrates a significant correlation with a quality of life; and GLFS-25 validity was confirmed. The outcome of a series of functional performance test with association of its score was demonstrated by a significant correlation which confirmed its reliability. The results of this study show that there is a significant correlation between locomotive syndrome and quality of life (p<0.05) which infers the quality of life is influenced by the locomotive syndrome among community living old people. The old age persons with locomotive syndrome were found to have a poorer quality of life than the persons without locomotive syndrome. Lawton (1991) proposed a Four Sector model in which wellness of psychology, perceived quality of life, behavioral and objective environment were present in the Quality of life of older individuals. In this study age and posture changes make muscles weak and lose its ability to control posture and balance to cause the locomotive syndrome and also the impairment of the activities of daily living, thus impairing their Quality of Life as a whole. This goes hand in hand with Hirano *et al* in 2013 studies which suggested that in the previous results of the study, lower quality of life scores in all sections of the short form-36 were significantly shown among the people with locomotive syndrome, and were shown that this syndrome strongly affects the quality of life ⁹. This study shows that there was a significant lower score on SF – 36 questionnaire in subjects with the locomotive syndrome (p<0.05). The generalized atrophy of all muscles accompanied by a replacement of some muscle tissue by fat deposits. This results in some loss of muscle tone and strength and also leads to the loss of calcium which affects the bone density. Due to the loss in the bone density, osteoporosis and weight bearing capacity is reduced, leading to the possibility of spontaneous fracture. Reduction in height can be due to thinning of the vertebrae. In addition, there can be changes in posture due to the calcification of vertebrae. These changes will results in alteration of quality of life to the elder people. This goes in hand with Ogaya S, Ikezoe T, Tateuchi H *et al*, 2010 stated that Locomotive syndrome causes a decrease in postural control that can cause a fear of falling or a decline in the amount of physical activity¹² Kenichi Hirano *et al* who stated that the subjects with locomotive syndrome scored significantly lower on the SF – 36 questionnaires than those without locomotive syndrome. In the previous study Lizuka *et al* in 2014 reported that a finding of locomotive syndrome was on a rise where as the quality of life were decreased it is significant correlated in the elderly Japanese population. Dunn A.L, *et al* in 1991 stated that motor function decreases with aging, which also leads to a decreases in ADL and QOL. There is a close relationship between the physical activity level of elderly living in the community and their health related QOL¹³. In this study there was a strong correlation between Locomotive syndrome and quality of life (p<0.05) that says that the locomotive syndrome were increased, the quality of life were decreased due to aging

of musculoskeletal system. Timed up and go test might be the most valuable function test which correlates closely with an individual's quality of life. Bischoff, *et al* in 2003 stated that community dwelling population should be able to perform the timed up and go test in 12 seconds or less. Timed up and go test performance has been found to decrease significantly with mobility impairments¹⁴. In this study there was a strong correlation between Locomotive syndrome and Timed Up and Go test that says that mobility is compromised following Locomotive syndrome and the Timed Up and Go test had more time duration taken worse is Locomotive syndrome. This study concluded that the significant correlation between timed up and go test and quality of life with locomotive syndrome among community living old age people.

CONCLUSION

This study concluded that there is significant correlation between timed up and go (TUG) test and quality of life (QOL) with locomotive syndrome among community living old age people.

Limitations: Size of the sample is small and Shorter duration of study. Recommendations: Future studies Comparison between males and females is recommended. Future studies can be concentrated on other regions like shoulder pain, ankle pain. Future studies can take questionnaires for low back pain and knee pain. Other quality of life (QOL) questionnaire can be used.

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