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"Effectiveness of MFR with Tennis Ball to Improve Walking In Post Stroke Rehabilitation"

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DESIGNATION
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ABSTRACT: Stroke is the sudden loss of neurological function caused by interruption of the blood flow to the brain. It is one of the leading cause of death and long term disability. Most common risk factor for stroke are hypertension, heart disease, diabetes mellitus, and disorders of heart rhythm. About 80% of stroke survivors have walking dysfunction.25% of the gait survivors have residual gait impairments despite of rehabilitation.
OBJECTIVE
1. To asses pretest walking pattern in stroke patients with help of foot print analysis and range of motion
2. To asses posttest walking pattern in stroke patients with help of foot print analysis and range of motion.

MATERIALS AND METHODOLOGY: The study was conducted in Krishna institute of medical sciences 'deemed to be' university karad. Materials used for the study included cardboard, pen ,paper, ink, tennis ball and inch tape. Sample size was selected as per inclusion and exclusion criteria which included 15 people. Consent was taken prior.
CONCLUSION:MFR with the help of tennis ball is significantly effective in improving walking in post stroke patients.
Key words: MFR, tennisball, stroke, walking

I. INTRODUCTION:

Myofascial release is collection of approaches and techniques that focus on freeing restriction movement that originate in the soft tissues of the body. The umbrella of MFR methods focuses on how postural habits, specific activities or lack of activity, and compensations for prior injuries results in chronic stress and avoidances of full range of movement.

Stroke is sudden loss of neurological function caused by interruption of the blood flow to the brain. It is one of the leading cause of death and long term disability. Most common risk factor for stroke are hypertension, heart disease, diabetes mellitus, and disorders of heart rhythm.

About 80% of stroke survivors have walking dysfunction. 25% of the gait survivors have residual gait impairments despite of rehabilitation. This can further lead to difficulty in activities of daily leaving.

Gait abnormality is characterized by pronounced clinical presentation of gait asymmetry, as compared to healthy people. In the context of spastic hemiparesis, muscles are weak and spastic as results a wide spectrum of gait abnormality is seen clinically

NORMAL GAIT:
A cycle begins when the heel of one foot touches the ground and ends after the leg and the body have advanced through the space and time and the heel of that same foot hits the ground again.
The gait cycle of one leg can be divided into two phases :

1. The stance phase (in which the leg in contact with the ground 60%.)
a) Initial contact
b) Loading response
c) Mid stance
d) Terminal stance
e) Pre swing
2. The swing phase (in which the leg is off the ground 40%.)
a) Initial swing
b) Mid swing
c) Terminal swing

Each leg has a period of beginning and end of stance when the opposite leg is also in contact with

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the ground. These are called the periods of double support.
Together they account for 10% of the initial stance phase and 10% of the end of the stance phase.
Other terms used in describing gait cycles are stride, step, cadence, and velocity.
Cadence is the number of steps or stride per unit time.
Waling velocity equals to speed: the distance walked divided by time.
HEMIPLEGIC GAIT:
Quadriceps strength and support determines walking independences. Though quadriceps spasticity is often linked with knee joint.

Another common observation is that stroke survivors have ankle plantarflexion and inversion.

The clinical presentation of ankle plantarflexion and inversion this abnormality is primarily caused by tibialis posterior gastrocnemius and soleus.

II. MATERIALS AND METHOD

The subjects in Krishna institute of medical sciences deemed to be university were screened and those fulfilling the inclusion and exclusion criteria were selected. 15 subjects were selected for the study. Participants were informed about the study and consent was taken. The subjects underwent pre and post-test using foot print analysis. A six week protocol was selected were subjects were given MFR with the help of tennis ball thrice in a week along with regular treatment protocol.

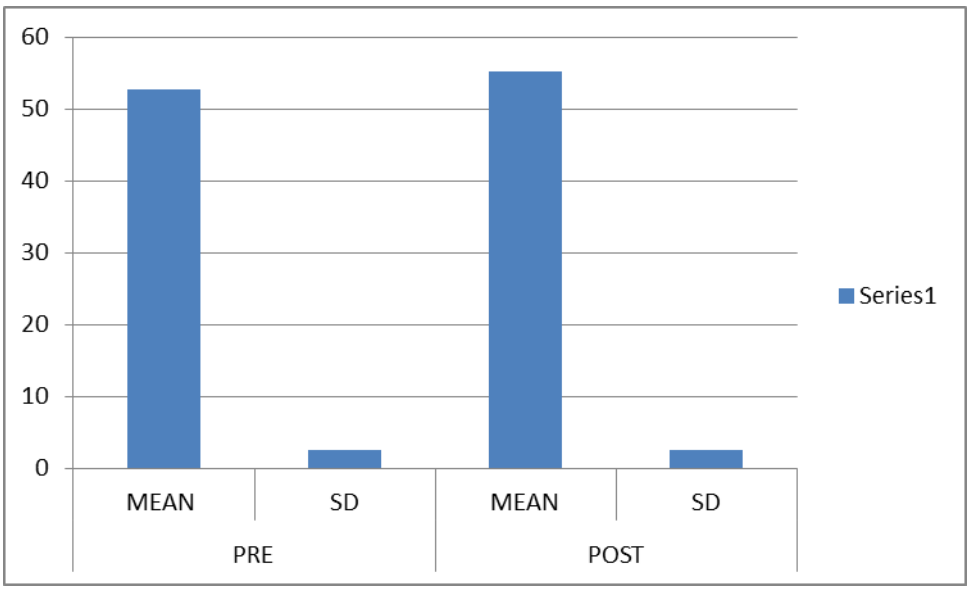
III. STATISTICAL ANALYSIS

Statistical analysis was done manually and by using the statistics software's INSTAT so as to verify the results derived. The statistical analysis of parametric data was done by using paired t test. Paired t test was used for statistical analysis of pre and post intervention within the group.

IV. RESULTS

1. STRIDE LENGTH

PRE		POST	
MEAN	SD	MEAN	SD
52.67	2.44	55.2	2.45



In present study the pre-test mean is 52.67 and SD is 2.44 whereas post-test mean is 55.2and SD is 2.45 which is extremely significant.

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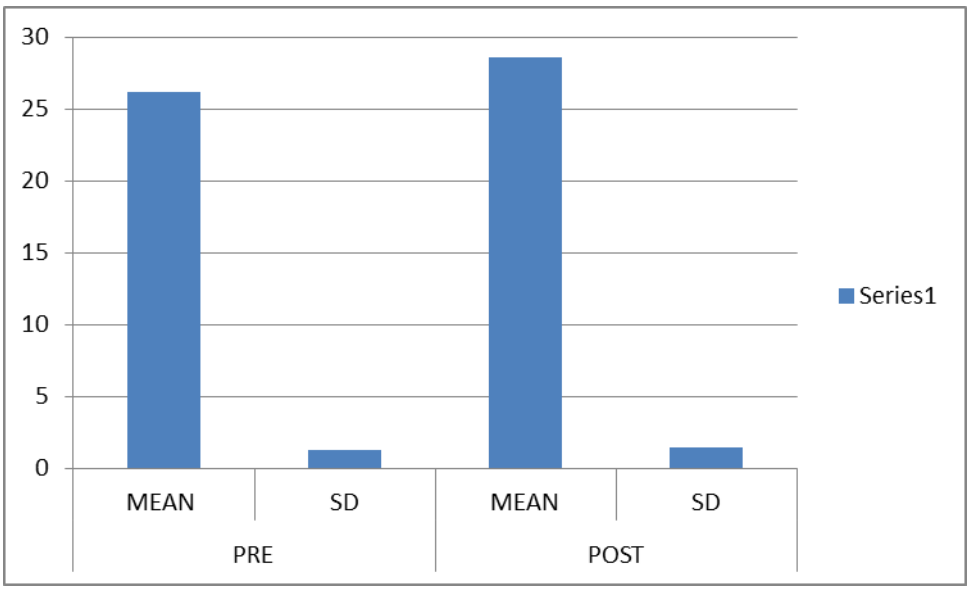
2. STEP LENGTH

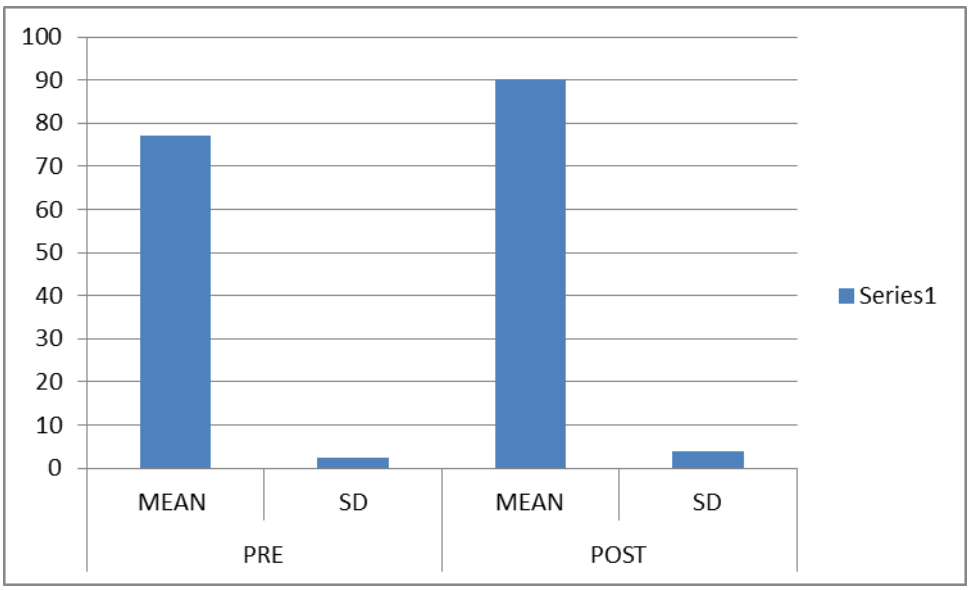
PRE		POST	
MEAN	SD	MEAN	SD
26.14	1.246	28.54	1.407



In present study the pre-test mean is 26.14 and SD is 1.246 whereas post-test mean is 28.54and SD is 1.407 which is extremely significant.

3. CADENCE

PRE		**POST**	
MEAN	**SD**	**MEAN**	**SD**
77.067	**2.492**	**90.097**	**3.77**



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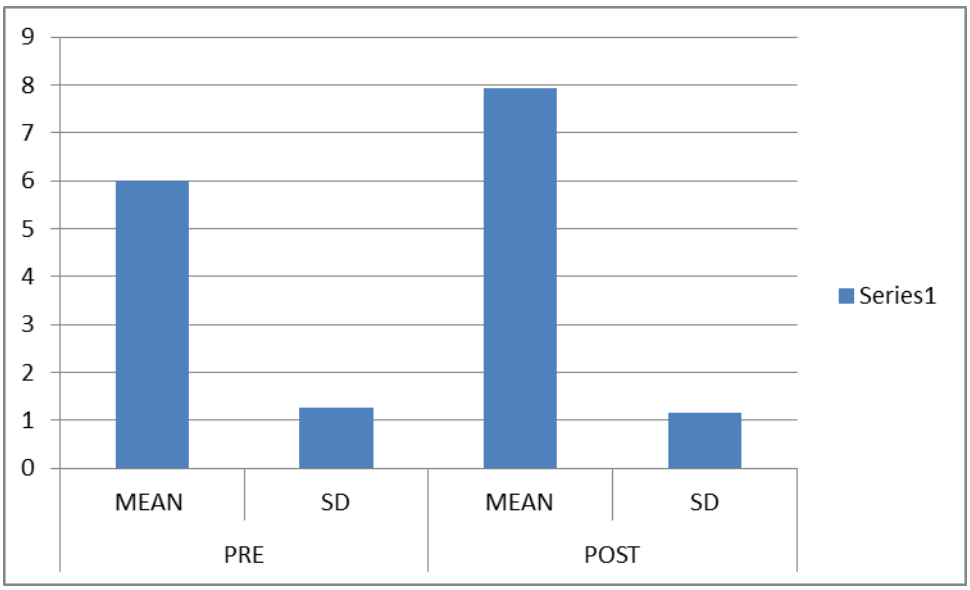
In present study the pre-test mean is 77.067 and SD is 2.492 whereas post-test mean is 90.097 and SD is 3.77 which is extremely significant.

4. STEP WIDTH

PRE		POST	
MEAN	SD	MEAN	SD
6	1.254	7.94	1.163



In present study the pre-test mean is 6 and SD is 1.254 whereas post-test mean is 7.94 and SD is 1.163 which is extremely significant.

V. DISCUSSION

Stroke is the sudden loss of neurological function caused by interruption of the blood flow to the brain. It one of the leading cause of death and long term disability. The estimated prevalence rate of stroke is 84-262/100000in rural area and 334-424/100000 in urban areas. In incidence rate is 119-145/100000 based on recent population based studies. Most common risk factor for stroke are hypertension, Heart disease, diabetes mellitus and disorders of heart rhythm.

About 80% of stroke survivors have walking dysfunction. 25% of the gait survivors have residual gait impairments despite of rehabilitation which can further lead to difficulties in activity of daily leaving.

Most common observation in stroke survivors have ankle plantar flexion and inversion. The clinical presentation of ankle plantar flexion and inversion abnormality is primarily caused by tibialis posterior gastrocnemius and soleus.

Myofascial release is collection of approaches and techniques that focus on freeing restriction movements that originate in the soft tissues of the body.

In this study 15 subjects were included and myofascial release therapy was given to tibialis posterior, gastrocnemius and soleus muscle with the help of tennis ball. It was a 6week protocol. Pre and post test results was analysed.

Table no.1 shows stride length. Stride length is defined as the distance between successive ground contact of the same foot. The pre-test mean is 52.67 and post-test mean is 55.2 whereas the pre-test SD is 2.44 and post-test SD is 2.45. both this values are extremely significant. The P value is <0.0001 and t value is 15.332.

Table no.2 shows results of step length. Step length is the distance measured from the heel print of one foot to the heel print of the other foot. The pre-test mean is 26.14 and post-test is 28.54 whereas pre-test SD is 1.246 and post-test 1.407. the p value is <0.0001 and t value is 18.330.

Table no.3 is about cadence. Cadence is rate at which a person walks, expressed in step per min. The pre-test mean is 77.067 and post-test 90.097 whereas pre-test SD is 2.497 and post-test is 3.77. The p value is <0.0001 and t value is 10.195.

Table no.4 shows results of step width. Step width is the mediolateral distance between

each foot's mid-heel at initial contact with the ground. The pre-test mean is 6 and post-test is 7.94 whereas the pre-test SD is 1.254 and post-test is 1.163. the p value is <0.0001 and t value is t value is 29.

CONCLUSION

MFR with the help of tennis ball is significantly effective in improving walking in post stroke patients.

FUNDING

Funding was provided by Krishna institute of medical sciences deem to be university.

CONFLICT OF INTEREST

There was no conflict of interest.

ETHICAL CLEARENCE

Ethical clearance was obtained from the protocol committee and institutional ethical committee of Krishna institute of medical sciences deemed to be university.

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