



Muscle Energy Technique v/s Deep Stripping Massage with eccentric resistance in calves' tightness in young adults.

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ABSTRACT

Objective

To study the comparison between the immediate effect of muscle energy technique v/s deep stripping massage with eccentric resistance in calves tightness in young adults

Background of the study

Calves tightness is a typical musculoskeletal condition in young people as a result of extended standing, walking, or jogging. A variety of treatments are available to alleviate such discomfort, including MET (Muscle Energy Technique) and Deep Stripping Method with eccentric resistance. This article investigates and analyses which of these therapies might be more beneficial on young adults. To conduct such a study, we gathered 30 young individuals and randomly separated them into two groups of 15 each. GROUP A would have had MET as their intervention, whereas GROUP B would have received deep stripping massage with eccentric resistance as their intervention. The ankle ROM (dorsiflexion) was used as the outcome measure. The universal Goniometer was used to assess the ankle dorsiflexion ROM before and after therapy. The impact of both regimens was observed and statistically analysed.

KEYWORDS: MET, Deep Stripping Massage, gastrocnemius, soleus, posterior calcaneus, femoral condyle, plantar fasciitis, ROM, goniometer, etc.

INTRODUCTION

Calf muscles play an essential part in our daily actions such as walking, standing, and balancing. When we talk about the calf, we refer to the lower leg's posterior compartment. The gastrocnemius and soleus muscles are part of the calf anatomy. The gastrocnemius is the superficial muscle with a medial and lateral head. The lateral head originates from the lateral femoral condyle's surface, while the medial head originates from the posterior, non-articular part of the medial femoral condyle. Together, these two comprise the Achilles tendon, which is placed into the posterior calcaneus. Muscle tightness is a common musculoskeletal problem that can lead to various ailments and injuries such as a disturbed gait pattern, poor balance, plantar fasciitis, etc. *Shyi-Kuen Wu et.al.(2015), determined in their study that a myofascial pain can result in muscle tightness of the region thus when MYP occurs at the calf, it results in tightness of the calf, thus affecting plantar flexors and the overall ankle-foot complex thus altering the gait pattern of the patient. Jeon Hyeong Lee, et.al.(2019), determined that calf tightness results in increased susceptibility of muscles and tendons to injury and also limits the ROM resulting in difficulty in maintaining the COM of the body in weight bearing position.* In lower-leg biomechanics, gastrocnemius tightness generates a significant increase in knee flexion at first contact and midstance; throughout the stance, the tibia is unable to move, resulting in an extension which further results in knee hyperextension. This increases the patient's risk of plantar fasciitis. *Ngomeuu T. Nakale, et.al. (2017), suggested that there is a strong connection between*

IGT and ankle and foot pathologies, the gastrocnemius tightness works as an assistance in developing plantar fasciitis especially amongst female gender and middle age population.

In addition, muscle tightness restricts the extension of the in-use joint, reducing its range of motion. As a result, the capacity to contract and relax muscles diminishes, further limiting the ROM of ankle dorsiflexion than is typical. This causes difficulty in maintaining the body's centre of mass when weight-bearing, resulting in compensating ankle motions that contribute to leg abnormalities. In addition, this weakens the action-reaction force against the locomotion ground. With constricted ankle dorsiflexion and calf tightness, the heel's job becomes a difficult challenge to overcome; the push of the heel when doing fundamental tasks such as walking, jogging, or ascending the stairs becomes difficult. Because the calf is a two-joint muscle, it has a detrimental impact on the individual's gait and balance and proprioceptive sensory difficulties. Overuse, poor posture, reduced flexibility, spasticity, and insufficient recovery from suffered muscular injuries or a lack of physical activity are critical causes of calf tightness. Muscular tension requires adequate illustrated therapy to minimise consequences like balance difficulties or plantar fasciitis. There are several therapies for calf muscle release, but we want to focus on MET and Deep stripping massage with eccentric resistance to see which one produces the best benefits in the same amount of time. **Fred Mitchell, Sr, D.O.** invented the Muscle Energy Technique (MET) in 1948. It is a type of manual treatment commonly employed in Osteopathy that utilises a muscle's energy in moderate isometric contractions to relax and stretch the muscles via autogenic or reciprocal inhibition. MET is an active approach in which the patient is also an active participant, as opposed to static stretching, a passive technique in which the therapist performs all of the work. The principles of MET are founded on the notions of Autogenic Inhibition and Reciprocal Inhibition. Autogenic Inhibition MET occurs when a submaximal muscular contraction is followed by extending the same muscle. Reciprocal inhibition MET occurs when a submaximal contraction of one muscle is followed by stretching the opposing muscle. **Aleksandra Kisikewicz, et.al. (2018)**, suggested that single application of MET was enough to restore the calf tightness which was induced in athletes after eccentric exercises. MET is a type of manipulation used to enhance musculoskeletal function and relieve pain in patients. It relies on patient-initiated isometric or isotonic contractions that are carefully guided and regulated. MET is based on a neuro-reflective autogenic inhibitory mechanism. It promotes antagonist muscular contraction, resulting in agonist muscle tone decrease, allowing relaxation and lengthening.

Another treatment for assisting muscle elongation is deep stripping massage (DSM). **S.Sudhakar,et.al. (2016)**, determined that Deep stripping massage with eccentric resistance is more effective in releasing calf tightness and improve the ROM of ankle dorsiflexion than static stretch with cryotherapy. It is another type of manipulative method that has been shown to release muscle fibres, eliciting bilateral calf flexibility, and thereby lowering muscular stiffness. It is applied along the length of the muscle fibres with the thumb, alleviating trigger points and tension. This method must be performed slowly and thoughtfully in order to feel the muscle beneath. For more intense pressure, use a single thumb and a couple of fingers from the opposite hand. The person should not feel any discomfort as a result of this massage.

METHODOLOGY

The universal goniometer¹ was used to diagnose 30 young adults with bilateral calf stiffness, between the ages of 18 and 25, excluding sprinters or other athletes, any other musculoskeletal deficiency or

¹ A goniometer is a tool that allows us to determine the possible range of motion in any joint. The primary and last evaluation stage in any injury or musculoskeletal disorder that assesses the available range of motion at a joint before and after therapy to consolidate the achieved

injury, any neurological deficiency, any fracture, any spinal injuries or surgery, infection/trauma, and a previous history of a spinal fracture.

Material Required

Elastic resistance band [Green colour Thera band], Universal goniometer, Velcro strap, Massage powder, Cryo Bag, Couch and Pillow.

PROCEDURE

A total of 30 bilateral patients were chosen, divided into groups at random, and informed about the study. GROUP A consisted of 15 people who were given MET workouts for 30 seconds with three repeats. GROUP B consisted of 15 people who received a deep stripping massage with eccentric resistance for 30 seconds and three repeats.

GROUP A

Muscle Energy Training

Subject to lean forward in supine position with knee extended and the ankle relaxed. Subjects were provided with MET exercises for calf tightness aiming at both gastrocnemius and soleus. A round of 3 reps were given for 30 seconds each.

GROUP B

Deep Stripping Massage with eccentric resistance

The patient is lying prone on a treatment table. A Velcro strap was utilised to wrap a green band (elastic resistance band) around the subject's midfoot. The free end of the resistance band is connected to the table and set such that there is no slack in it during the intervention to produce eccentric resistance throughout the complete range of motion. A small quantity of massage powder was then gently applied to the affected calf muscle. Deep longitudinal stripping massage strokes are performed on the subject's calf muscles. The longitudinal stripping massage strokes are performed with both thumbs, one on top of the other, for approximately ten deep stripping massage strokes. The individual was told to commence complete Dorsiflexion ROM against Theraband during the administration of longitudinal stripping massage. Throughout the technique, the therapist solicits input from the individual on the pressure and adjusts the amount of force delivered with each stroke.

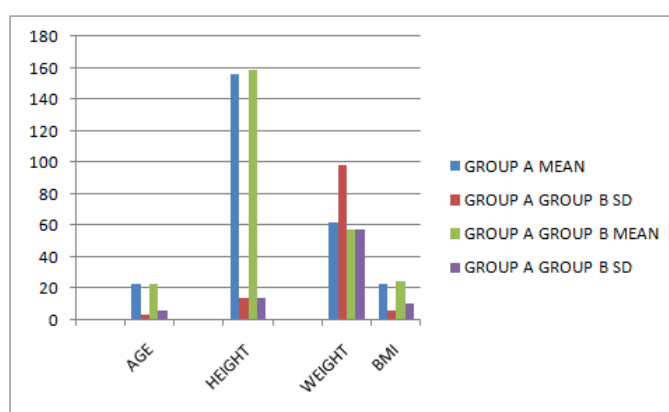
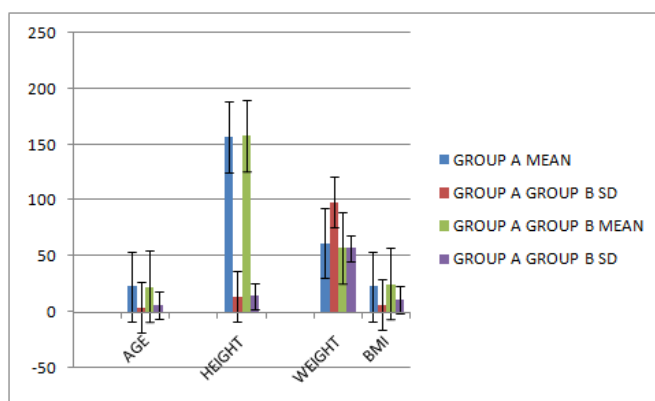
EXERCISE	REPITITIONS & SETS
MET for Gastrocnemius	3 sets* 3 repetition each side for 30 seconds
MET for Soleus	3 sets* 3 repetition each side for 30 seconds
Deep Stripping Massage with eccentric resistance	3 sets* 3 repetition each side for 30 seconds

outcomes. Goniometry is the measurement of range of motion with a goniometer. A goniometer is used to monitor the patient's progress during the therapy programme. The goniometer utilised in the study is a metal universal goniometer. It is made up of three parts: a fixed arm, a moving arm, and a fulcrum. In a study done by **Megan M.Konor, (2012)**, the goniometer has turned out to be a reliable measurement technique for Ankle ROM dorsiflexion.

DATA ANALYSIS²

	GROUP A		GROUP B	
	MEAN	SD	MEAN	SD
AGE	22.93	3.92	22.73	6.07
HEIGHT	156.47	14.12	158.47	14.41
WEIGHT	61.8	98.6	57.73	57.35
BMI	22.93	6.37	25.14	11.04

Table 1: Description of demographic data of Group A & Group B through *Paired T Test*

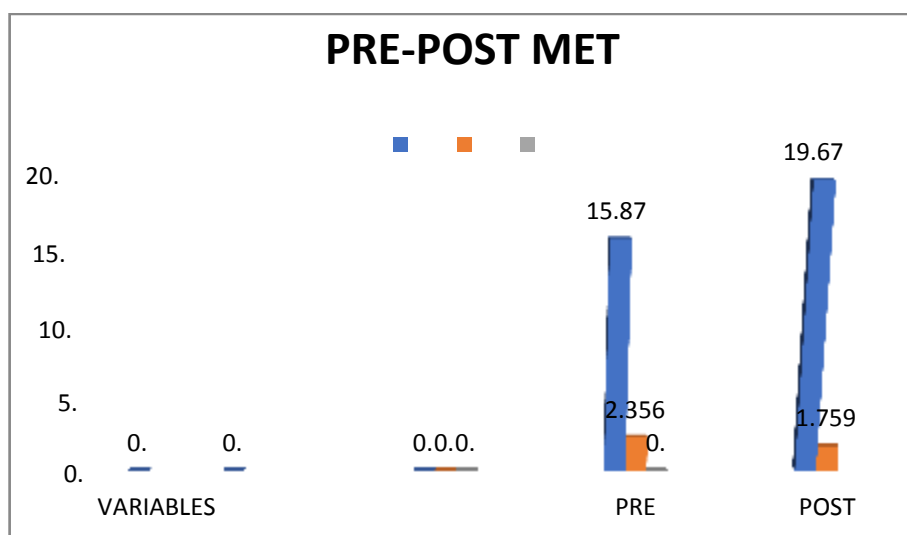


² • "SPSS21.0 VERSION" was used to analyse the data. The demographic data and BMI of the two groups were compared using a paired T-test within the group. MS EXCEL 2011 is used to create the graphical depiction.

• "SPSS21.0 VERSION" was used to analyse the data. Within the group, a one-way annova calculator was utilised to compare the before and post findings. MS EXCEL 2011 is used to create the graphical depiction.

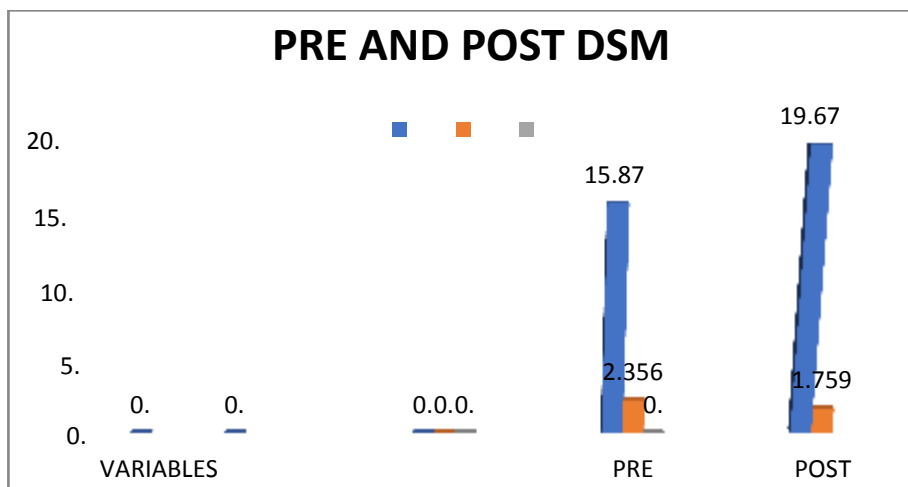
VARIABLES	GROUP A (N=15)		
	MEAN	SD	P-value
PRE	15.8	2.3964	.004175
POST	18.2667	1.9074	

Table 2: Comparison of MEAN between pre and post score of Group A



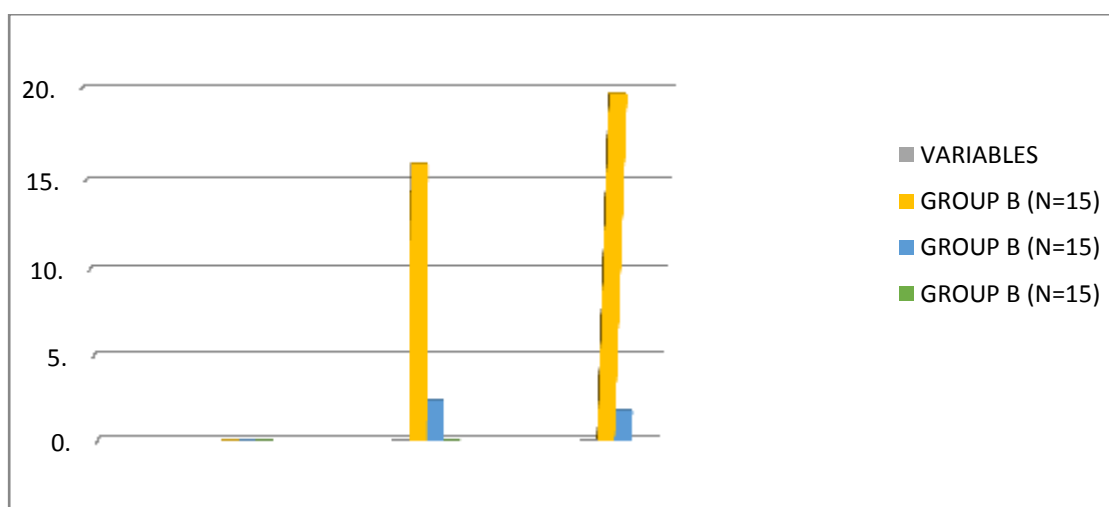
VARIABLES	GROUP B (N=15)		
	MEAN	SD	P-value
PRE	15.8667	2.3563	.000027
POST	19.6667	1.7593	

Table3: Comparison of MEAN between pre and post intervention score of Group B



VARIABLES	GROUP A (N=15)			GROUP B (N=15)		
	MEAN	SD	P-value	MEAN	SD	P-value
PRE	15.8	2.3964	.004175	15.8667	2.3563	.000027
POST	18.2667	1.9074		19.6667	1.7593	

Table 4: Comparison of MEAN between pre and post interventions of Group A and Group B



- The f-ratio is 11.98098. The p-value is <.00001. The result is significant at p<.05.

RESULTS AND DISCUSSION

CONCLUSION

Based on the findings, this study indicated that there was a substantial improvement in the assessed Pre ROM ankle dorsiflexion and Post ROM ankle dorsiflexion with the universal goniometer in Group A, which received Muscle energy technique intervention. As a consequence, we may infer that, as compared to Deep Stripping Massage with Eccentric Resistance, Muscular Energy Techniques provide more rapid improvements in calf muscle stiffness.

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