



Immediate effect of MET vs Static Stretching on Tendo–Achilles Tightness

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Abstract

Static stretching commonly used conventional technique to lengthen a shortened muscle/group of muscles. Literature showed that MET improves flexibility and range of joint hence the need to find out immediate efficacy of MET over static stretching techniques. 70 subjects were screened for Tendo-achilles tightness on the Weight-bearing Lunge test and Ankle Flexibility Test. They were then randomly allocated into groups of self stretching and MET. Pre and post reading were recorded. Study concluded, MET is statistically significant in Ankle Flexibility Test. The two interventions were equally effective on the Weight-Bearing Lunge Test.

Keywords: *Tendo-achilles, MET, Static-Stretching.*

Introduction

The Achilles is the largest and strongest tendon in the human body. The gastrocnemius and Soleus muscle unite to become the tendon at the lower end of calf.

Flexibility is absolute range of movement in a joint(s) and length in muscles that cross the joint¹⁶.

Loss of flexibility can be a predisposing factor for pain syndrome or balance disorders. There are many factors that affect flexibility: Internal factors – training oversight, muscle strength, endurance and range of motion and genetics. External factors- weather, age, walking surface, shoes.

Stretching is defined as the act of applying tensile force to lengthen muscles and connective tissues.

There are various techniques of stretching like static ,dynamic , ballistic, PNF.

It is reported that about 88% of forefoot & ankle problems arise due to gastrocnemius tightness & contractures.

A greater range of movement in the ankle can often prevent sprains.

It also seen in the people with long sitting jobs & sedentary lifestyle.

Muscle energy techniques are a class of soft tissue osteopathic (originally) manipulation methods that incorporate precisely directed and controlled patient initiated, isometric and / or isotonic contractions, designed to improve musculoskeletal function and reduce pain.

Static stretching is the conventional intervention to lengthen a shortened muscle or group of muscles. Studies have shown MET improves flexibility and joint range, there is need to find out immediate efficacy of MET over static stretching techniques. Static stretching is a very common and conventional technique used to lengthen a shortened muscle or group of muscles. Although studies have shown that MET improves flexibility and range of motion, there is a need to find out immediate efficacy of MET over static stretching techniques.

Methodology

The following is an experimental study carried out by random sampling. The study was conducted on students aged 18-30^{1, 3} of MAEER’s Physiotherapy College and MIMER Medical College, Talegaon. Cases were selected based on Weight Bearing Lunge Test (WBLT)¹² and Ankle Flexibility Test (AFT)¹³. Participants with recent fractures of the spine or lower limb or suffering from any neurological conditions were excluded.

Procedure

Participant’s informed consent was taken. The 60 participants were randomly divided and assigned to two groups. Group A (n=30) MET (Post Isometric Relaxation), Group B (n=30) Static Self Stretching. The following interventions were given only for the dominant side.

Group A were given MET for gastrocnemius and soleus. Three sets of MET (PIR) were given for both the muscle group. Each stretch held for 30 seconds following 10 seconds of isometric contraction.

Group B were instructed to perform self stretches for the gastrocnemius and soleus which were repeated thrice and each held for 30 seconds.

OUTCOME MEASURES

Immediately after the interventions WBLT and AFT were re-assessed.

STATISTICAL ANALYSIS AND RESULT

All the statistical analysis was done using Instat software.

Pre and post values of WBLT and AFT were analyzed within the groups using paired t test. Inter-group values using K-S test.

Table 1: WBLT

	Pre(Mean)	Post((Mean)	SD	p value
Group A (MET)	9.733	11.443	1.506	0.0225
Group B	9.28	10.6	1.293	0.0232

Table 2: Ankle Flexibility Test

	Pre(Mean)	Post((Mean)	SD	p value
Group A (MET)	57.25	63.994	4.953	0.0615
Group B (STATIC)	62.793	67.267	2.566	0.10

Graph 1 WBLT Unpaired

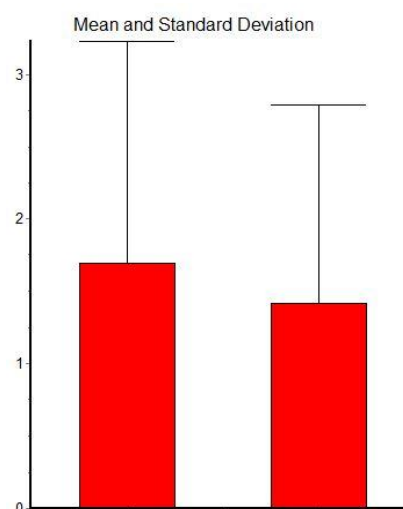
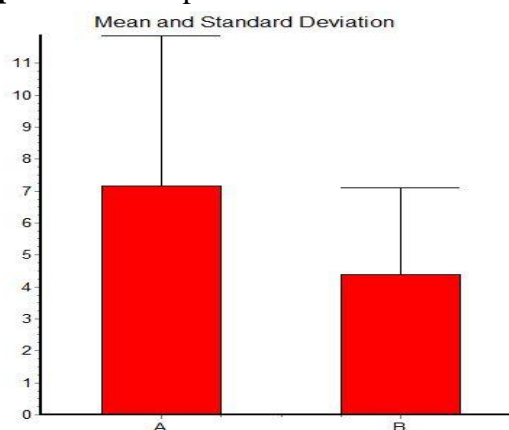


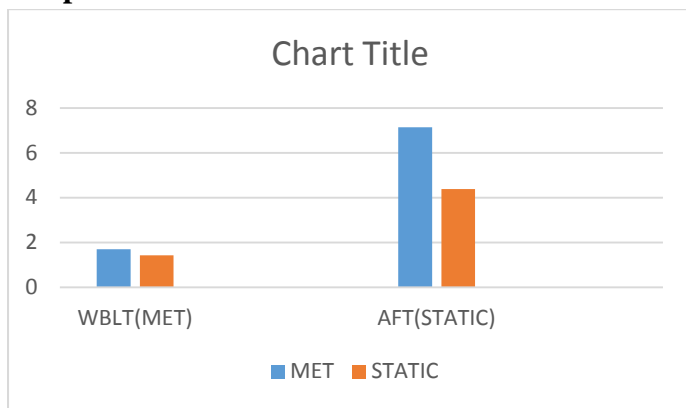
Table 3: Unpaired t test

	Mean	SD	p value
WBLT (MET)	1.697	1.531	0.0288
WBLT (Static)	1.420	1.365	0.0086

Graph 2: AFT Unpaired



Graph 3



Result

The study revealed that both the interventions are equally effective in reducing Tendo-Achilles tightness. However, it revealed a marked increase in the results of the AFT in subjects who were given MET

Discussion

The current study was undertaken to assess the immediate effect of M.E.T. vs Static Stretching for Tendo-Achilles tightness.

For the purpose of this study 70 participants were screened. Out of 60 patients with tightness were taken & divided into 2 groups by random chit method. 30 patients were given M.E.T. and the other 30 were given Static self stretching. Pre and post WBLT & AFT values were assessed. The study revealed that both treatment groups attained successful outcomes on AFT (p is 0.0079) whereas, no statistically significant result were obtained on the WBLT (p is 0.4630). Thus according to AFT, MET is more effective in increasing Ankle ROM than static stretching whereas the WBLT states both MET and static stretching are equally effective in reducing tendo-achilles tightness.

Efficacy of MET (PIR) is attributed to the physiological response of the antagonist of a muscle which has been isometrically contracted – reciprocal inhibition (RI) when a muscle is isometrically contracted, its antagonist will be inhibited and will demonstrate reduced tone immediately. Apart from the well-understood processes of reciprocal inhibition the precise reason for effectiveness of MET remains unclear,

despite the commonly held view that an isometrically held contraction seems to set a muscle to a new length by inhibiting the influence of the golgi tendon organ.

Effectiveness of both techniques on the gastrocnemius as compared to soleus could be attributed to the difference in the muscle itself, for soleus, a so called “red muscle”, its characterized by relative slower contractions, less fatigability, a slower contractions than the “white” gastrocnemius.

It is seen that spindles in fast – contracting muscles show greater per unit stretch than in slow ones in the muscle itself, for soleus, a so called “red muscle”, its characterized by relative slower contractions, less fatigability, a slower contractions than the “white” gastrocnemius. It is seen that spindles in fast – contracting muscles show greater per unit stretch than in slow ones^{18,19}.

Conclusion and Clinical Significance

The immediate effect of MET is clinically significant when compared to static stretching.

Equal number of repetitions of both methods were given, and still MET had a greater effect. So we can imply that fewer repetitions of MET could have greater or equal effect as static stretching

Scope and Limitations

SCOPE

This study could be done on specific groups who are predisposed to plantar fasciitis, forefoot pain, and Achilles tendinitis and ankle problems, based on their profession, comorbidities or sport.

Limitations

Ankle range of motion could be included as an outcome measure as MET showed a positive effect on gastrocnemius tightness.

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