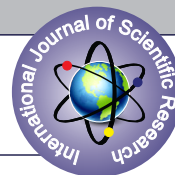


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COMPARATIVE STUDY OF IMMEDIATE EFFECT OF SELF MYOFASCIAL RELEASE (USING FOAM ROLLER) VERSUS PASSIVE STRETCHING ON ANKLE DORSIFLEXION RANGE OF MOTION OVER TRICEPS SURAE IN RECREATIONAL MARATHON RUNNERS.



Physiotherapy

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ABSTRACT

Triceps surae (calf muscle) consists of two heads of gastrocnemius & soleus. Since running requires more ankle dorsiflexion range than walking, it would be beneficial for Recreational Marathon Runners. Self Myofascial Release (Foam Rolling) is popular intervention used by athletes to improve myofascial mobility, whereas Passive Stretching is traditionally used by therapists for same. The purpose of this study was to find which of two interventions have better immediate effect on ankle DROM. Comparative study was done with 25 runners in FR & 25 in PS group. Both interventions were given for 3 reps of 30 sec each after general warm-up session. Ankle ranges were measured using goniometry & WBLT. Mean difference for Goniometry of FR (2.8) is higher than PS (1.0). Mean Difference for WBLT of FR (0.626) is higher than PS (0.220). Thus, Foam rolling has better immediate effect on ankle DROM than passive stretching in Recreational Marathon Runners.

KEYWORDS

Recreational Marathon Runners, Foam Rolling, Goniometry, Weight Bearing Lunge test

INTRODUCTION

Triceps surae (TS) is a calf muscle consisting two heads of GASTROCNEMIUS & SOLEUS. It's strong PLANTAR FLEXOR of foot at ankle joint, which is important in running. (1) Running requires more D-ROM than walking. Ankle D-ROM for running is 23°-30° Ankle D-ROM for walking is 10°. (2,3). Recreational marathon runners are long distance runners who participate in marathons not at elite levels. Common injuries of RMR are usually in knee (32.4%) followed by foot & ankle (32.4%) along with TA (1.5%). TS are usually shortened because of these injuries. When running speed increases, stiffness of all three joints tend to increase. (4) Training programs of RMR include strength training of lower limbs (TS) to enhance running performance. (5) The increased strength leads to TS tendon-Aponeurosis stiffness. (6) This further causes decreased ankle D-ROM, thus affecting running performance. (6) Self Myofascial Release is a popular intervention used to enhance myofascial mobility. Common tools include the foam roller (FR) and roller massager. With FR, client uses their bodyweight to apply pressure to soft tissues during rolling motion. Evidence suggests that these tools can enhance joint ROM (7). Passive stretching is a method in which soft tissues are elongated just past the point of tissue resistance and then held in lengthened position with a sustained stretch force over a period of time. (3) Increased flexibility is defined by greater joint ROM, is often desirable immediately prior to sports performance. (7,8) Therefore, comparative study has to be done to find out which of two interventions is better in producing immediate effect on ankle DROM in RMR.

Ankle DROM was measured using Goniometry & Weight Bearing Lunge Test. (9,10)

MATERIALS & METHODOLOGY

It was comparative study assessing ankle DROM of RMR with 25 in FR group & 25 in PS. Inclusion Criteria for both groups were RMR undergoing training for more than 6 months & Resistance training for at least 3 hours/week (According to ACSM guidelines). Exclusion Criteria were those with any known neuromuscular or musculoskeletal pathology of foot or ankle, neurological or orthopedic foot condition, hyper-flexibility of the lower extremity, recent injury of the lower extremity, and irregularity of the training. (7,8)

PROCEDURE

Subjects used dominant leg throughout project determined by leg subject preferred when instructed to kick a ball. Each intervention was performed barefoot with warm-up done before hand & then subject was allocated to either group by chit method. All subjects were assessed before & immediately after intervention with Universal Goniometry & WBLT. The interventions to be performed were demonstrated. Subjects then went forward to perform either FR or PS. PS performed in standing with one leg on edge of bench or stepper,

knees extended & ankle dorsiflexed touching heel to ground (allow subject to lean against wall for support). Subjects were instructed to stretch until they feel the stretch pain 7 out of 10 on Numeric Rating Scale.

Foam roller used was made of a uniform cylinder with a hard hollow inner core covered with soft but firm foam. FR was performed with leg extended & other leg superimposed. Subjects uses arms to propel roller front-back in middle one third of leg downwards.

Dosage was kept same at 3 reps of 30 sec with 10 sec rest in between 2 bouts.



Figure 1: Intervention
1.A – Passive Stretching
1.B – Foam Rolling

RESULT

To compare the pre and post values of Goniometry and Weight Bearing Lunge Test (WBLT) – Wilcoxon matched pair test was performed.

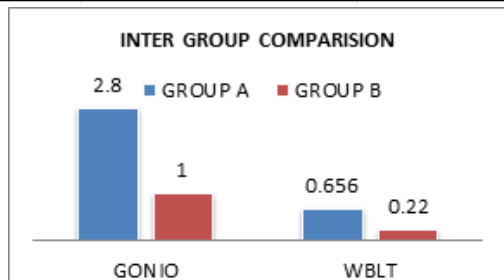
When Intra-group comparison was done, the result showed significant difference (with p-value <0.0001) in pre & post values of Goniometry and WBLT in both group A and group B.

The Inter group comparison was done using Mann-Whitney test.

The difference between the pre and post values of group A was compared with those of group B.

TABLE-1: Mean difference of Goniometry & WBLT measurements

	Goniometry (°)	WBLT (cm)
Group A	2.8	0.656
Group B	1.0	0.220
P value	<0.0001	0.0019
Significance	EXTREMELY SIGNIFICANT	VERY SIGNIFICANT



GRAPH-1: Graph showing intergroup comparison

DISCUSSION

The immediate effects of FR & PS were observed on ankle D-ROM in RMR. It was found that FR & PS both cause immediate increase in ankle D-ROM but mean difference of that of FR was superior to that of PS. When a muscle is stretched (PS), shift occurs in its force-length relationship, which reduces stiffness of muscle tendon unit. While immediate increase in ankle D-ROM with FR may be due to changes in visco-elastic & thixotropic property of fascia.⁽²⁾ Other being increase in intra-muscular temperature & blood flow because of grinding of Foam roller alterations in muscle spindle length or stretch perception & Foam Roller mechanically breaking own scar tissue & remobilizing fascia back to gel-like state.^(7,8)

LIMITATIONS

Pressure exerted during FR was not accurately measured & controlled for all subjects.

Subjects & therapist were aware of their result.

CONCLUSION

FR & PS both lead to increase in ankle D-ROM immediately after intervention. However FR is more effective than PS in increasing ankle D-ROM immediately in recreational marathon runners.

CLINICAL IMPLICATION

Increased flexibility is defined by greater joint ROM, is often desirable immediately prior to sports performance, so Foam rolling can be used before running to enhance running performance.

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