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EFFECT OF ILIOPSOAS MUSCLE RELEASE ON RUNNING SPEED IN RECREATIONAL RUNNERS

Ms. Samruddhi D. Patil
Intern, Krishna College of Physiotherapy, Krishna Institute of Medical sciences "Deemed To Be University" Karad.
Email ID: samruddhidevpatil003@gmail.com

Dr. Poonam Patil
Assistant Professor, HOD, Department of cardio-pulmonary physiotherapy, Krishna College Of Physiotherapy, Krishna Institute Of Medical Sciences "Deemed To Be University" Karad, 415339, Maharashtra, India.
Email Id- drppatil8388@gmail.com

Mr. Dhirajkumar Mane
Statistician, Directorate of Research, Krishna Institute of Medical Sciences "Deemed To Be University" Karad, 415339, Maharashtra, India.

Author Correspondence: Dr. Poonam Patil

ABSTRACT

Background and Objective: Running has steadily gained worldwide popularity and is the primary mode of exercise for many. This, increase in activities have further observed a steady increase in the incidences of injuries. Recreational function and activities like running results in hip pain, limitation of motion or both. Iliopsoas, being the primary and the strongest hip flexor plays an important role in the maintaining integrity and strength of hip joint. Iliopsoas muscle tightness occur as a result of overuse or strain in recreational runners. The main goal of this study was to determine how the release of the iliopsoas affected recreational runners' running speeds.

Materials and methodology: 40 recreational runners were included in the study. Static release and Dynamic release was given to the patients. Pre-test assessments included the Straight Line Sprint Test (SPT), Manual Muscle Testing (MMT), Range of Motion (ROM), and Visual Analogue Scale (VAS) on rest and exercise.

Result: Pain is significantly reduced during both, rest and VAS exercise. The mobility of the hip joint has significantly increased based on the ROM. There is a significant improvement on muscle strength evaluated by MMT.

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Conclusion: There is significant increase in running speed of recreational runners, along with significant decrease in pain,

Keywords: iliopsoas muscle, recreational runners, running speed, muscle release

INTRODUCTION

One of the most well-liked and accessible sports that people all over the world participate in is running.[12] Over the past 50 years, its popularity has grown. Running has been linked to longevity and a decrease in the risk factors for cardiovascular diseases, making it an excellent form of exercise for those aiming to achieve physical fitness and a healthy lifestyle.[10] Running is a form of both anaerobic exercise and aerobic exercise. It is a complex, coordinated process which involves the entire body.[10]

Despite the health advantages, musculoskeletal injuries from running are fairly prevalent. Injury prevalence and incidence among runners varies from 3.2% to 84.9%, respectively.[1] Additionally, 36% of runners have musculoskeletal injuries, according to reports. [14]

In recreational runners, running related injuries are most commonly seen in the lower extremity. Patellofemoral discomfort, iliotibial band syndrome, and plantar fasciitis are some of the most common diagnoses among recreational runners, with proportions to total injuries ranging from 10-17%, 4-8%, and 5-8% respectively.[8]

Muscle tightness is one of the main clinical causes of running. 92% of injured runners have one or more muscular imbalances that could be a factor in their ailment.[8] Flexibility is influenced by a multitude of variables, including gender, age, muscle size, and warm-up. Males and females have different levels of flexibility, with females having greater valgus angulation at the knee as a result of differences in pelvic anatomy and other anatomical factors.

Compared to non-runners, runners tend to have tighter rectus femoris and iliopsoas muscles. The prevalence of iliopsoas tightness is 33.8% in runners.[2]

When walking, running, or getting up from a chair, the iliopsoas muscle acts as the hip joint's main mover and aids in stabilising the hip and lower back. Iliopsoas muscle activity occurs during swing phase for 30-60% of the running cycle. The tightness of iliopsoas muscle leads to reduced velocity while flexion of hip joint.[11] Reduced velocity of hip flexion leads to decreased running speed.

The iliopsoas muscle has the greatest influence on the running speed compared to other muscles. Stretching of tight muscles is a very common on-going physiotherapy practice. There are various types of stretches such as static, dynamic, and ballistic.[3]

Active dynamic stretching of the main lower limb muscle groups has been found to benefit professional sprinters in terms of reducing the time required to complete a 50-meter sprint. In comparison to no-stretch settings, dynamic stretching of the lower limbs in professional soccer players led to faster 10-meter sprint times and higher peak speed over 20 metres. 20-meter sprint performance after static stretching of the calf and thigh muscles revealed considerably slower timings in the post-stretch trials compared to the no-stretch trials.[7]

Investigating the effects of iliopsoas muscle release on recreational runners' running speed is the primary goal of this study.

Material and Methodology

- Study Design: Observational Study

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- Study Type: Experimental Study
- Study Setting: Krishna College of Physiotherapy, Karad
- Target Population: Recreational Runner
- Sample Size: 40

$$\left(\frac{4pq}{L^2} \right)$$

p= prevalence

q= (1-p)

L= allowance error

- Sampling Method: Convenient Sampling
- Duration of study: 3 months
- Inclusion Criteria: Both male and female
  Age limit 18-30
  Recreational runners.
  Anterior hip pain on activity.
  Modified Thomas test positive.

- Exclusion Criteria: Runners who had experience in gymnastics, dance, yoga
  Patients who had history of surgeries.
  Trauma
  Recurrent ankle sprain.
  Hernia

- Outcome measures: Visual Analog Scale
  Range of motion of hip joint
  Modified Thomas test
  Straight line sprint test

Procedure

- This is a study to assess efficacy iliopsoas muscle release on running speed in recreational runners.
- This research was carried out at the Krishna Institute of Medical Sciences, Karad.
- The Institutional Ethical Committee of Krishna Institute of Medical Sciences 'Deemed to-be' University, Karad, has received a certificate of ethical clearance.
- According to the inclusion exclusion criteria, subjects were chosen.
- An informed written consent was obtained from the subjects.
- A pre-test Assessment of VAS on rest and on activity, MMT, ROM and SPT was taken.
- Patients were explained regarding the 3 weeks protocol which was divided in 2 phases
- Phase 1 is of 1.5 weeks, where only static release was given.
- In phase 2, static release was progressed to dynamic release.

1**] Static release:-**

Subject lied in supine position with hip and knee flexed.
Patient was asked to breathe in and out.
While breathing out, therapist applied deep pressure just above the ASIS.

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While maintaining the pressure, 10 oscillations were given for 10 minutes with 10 seconds hold in 3 sets

2] Dynamic release:-

Subject lied in supine position and were asked to breathe in and out.

While breathing out, therapist applied deep pressure just above the ASIS.

The subject was asked to simultaneously perform hip flexion, hip extension + internal rotation.

Oscillations were given when the leg was in hip extension + internal rotation. 10 oscillations were given for 10 minutes with 10 seconds hold in 3 sets

Post 3 weeks of protocol a post assessment was taken for VAS on rest and on activity, ROM, MMT and SPT.

Data was collected and analyzed statistically

Fig.no.1:-Static Iliopsoas Release

Fig.no.2:-Dynamic Iliopsoas Release

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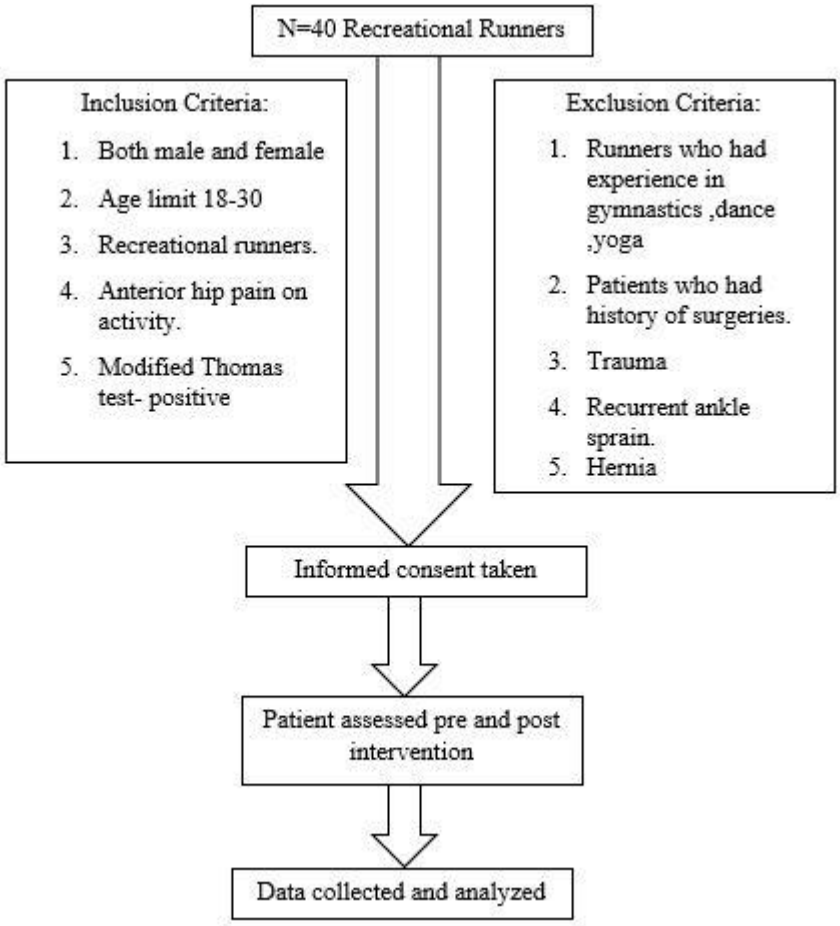
Fig.no.3:- Straight Line Sprit Test



Result

- There were 40 patients in all, ranging in age from 18 to 30. The mean age of patients was 23.7±3.97 years. Out of 40 patients 14 were females and 26 were males.

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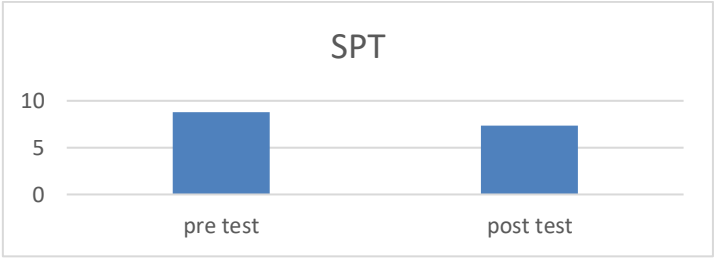
- Patients treated with the given exercise program has shown decrease in pain VAS on rest mean score 2.68 to 1. 13. According to statistics, there was a highly significant difference ($p<0.0001$) between the pre- and post-intervention assessments.
- Patients treated with the given exercise program has shown decrease in pain VAS on activity mean score 2.96 to 1.37. Statistically it shows that there was extremely significant difference ($p<0.0001$) between pre intervention assessment and post intervention assessment.
- Patients treated with the given exercise program has shown increase in hip range of motion with mean score of flexion from 113.1 to 118.9, extension from 8.45 to 13.6, abduction from 38.2 to 39.2 and adduction from 19.6 to 21.2. Statistically it shows that there was extremely significant difference ($p<0.0001$) between pre intervention assessment and post intervention assessment.
- Patients treated with the given exercise program has shown increase in muscle strength assessed using MMT with mean score of 4.72 TO 4.92. Statistically it shows that there was extremely significant difference ($p<0.0001$) between pre intervention assessment and post intervention assessment.
- Patients were assessed pre intervention and post intervention with SPT test. Patients treated with the given exercise program has shown increase in running speed with mean score 8.79 to 7.30. Statistically it shows that there was extremely significant difference ($p<0.0001$) between pre intervention assessment and post intervention assessment.

Table 1: Mean, Standard Deviation and *P* Value for SPT Pre and Post Intervention

Outcome cmeasure	**Pre test**	**Post test**		**interpretation**
	Mean ± SD	**Mean ± SD**	***p*- value**	Extremely significant
SPT	8.79±0.53	7.30 ± 0.46	< 0.0001	



Graph 1: Result for Straight Line Sprint Test (Pre and Post)

Discussion

The findings of this study showed that iliopsoas release is useful in boosting recreational runners' running speeds. The authors of a study measured the effects of stretching on a dynamic event immediately after stretching (0-60 seconds), whereas other studies investigated the effects of stretching on performance approximately 3-10 minutes following the performance of stretching.[5]

A study carried out by Winchester et al reported a 3% decrease in sprint performance for track and field athletes after participating in a static stretching protocol, which was conducted after a 30 minute dynamic warm-up.[4]

Prior studies found that, even when combined with active dynamic stretching, passive static stretching increased the 50-m sprint time (decreased sprint performance) in a group of

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competitive track and field athletes. Conversely, they observed a decrease in 50-m sprint time (improvement in performance) after warm-ups involving static dynamic stretches combined with active dynamic stretches or with the active dynamic stretches alone.[6]

Little and Williams reported that a static-stretch protocol produced significantly faster runs than did the no-stretch protocol for the 20 m sprint.6 However, in their study, subjects performed further warm-up activity after the stretching, which may have affected the immediate adverse effects of static stretching that have been previously reported. Vetter reported no changes on a 30-m sprint after static stretching.[9]

Only after the NS condition did a study reveal considerably faster post-40-yard sprint timings when compared to pre-40-yard sprint times. This study's utilisation of a small group of untrained, leisure-time, non-competitive runners as opposed to trained runners had some drawbacks. It is crucial to avoid extrapolating the findings to competitive runners as a result. Yet, the results of this study may be more relevant for trained runners than recreational runners due, in part, to stringent training regimens, warm-up routines, and stretching protocols as well as potential differences in parameters such as height, weight, and BMI.[13] More samples can be used in future studies, and the length of the treatment procedure can be lengthened.

CONCLUSION

In this present study, there is significant increase in running speed of recreational runners, along with significant decrease in pain, improved strength and mobility of lower limb muscles. The structured exercise program designed, have been effective for other types of runners and different age group.

Future studies can include more exercises and can build a step-by-step protocol.

Conflict of Interest

The authors declare no conflict of interest.

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