SHORT REPORT

A comparative study of dynamic soft tissue mobilization vs. passive stretching technique to improve the flexibility of hamstrings in cricket players

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Abstract

Different therapies are available for correcting the tightness of hamstring muscles. Objective of this study was to compare the effectiveness of Dynamic Soft Tissue Mobilization DSTM technique and Passive Stretching PS to improve the flexibility of tight hamstrings in cricket players. A total of 120 cricket players having tightness of hamstrings were enrolled and randomized into two groups A and B using lottery method. Group-A was treated with DSTM and group-B with PS to improve the flexibility of hamstrings. Active Knee Extension Angle AKEA test was used to measure the hamstring tightness as it is a gold standard test for this purpose. The mean value of AKEA, pre-treatment score deficient to 180 degrees for DSTM was 25.66 ± 6.90, and that of PS was 25.46 ± 6.89, while the post-treatment score was 10.81 ± 4.30, and 18.63 ± 7.06 respectively. Post-treatment score for DSTM was statistically lower than PS. (p-value < 0.05). So it was concluded that it is better to use DSTM for acquiring better results.

Keywords: Flexibility, Passive Stretching, hamstrings, Knee extension angle.

Introduction

Any decrease in the flexibility of hamstrings or tightness can cause hamstring injuries which are the most common type of injury among athletes and have a slow recovery rate, make health expenditures high and also decrease the performance level of the athlete. In contact sports the prevalence of hamstring tightness is very high.

Diana Hopper studied the effects of dynamic soft tissue mobilization in the treatment of muscle tightness and attaining muscle's normal length. It was found that subjects who received DSTM achieved significantly greater increases in hamstring flexibility than the control and classic STM groups.[1] It is important to have the normal flexibility of hamstring muscles to move smoothly because the tightness of hamstrings can lead to various problems like Patellofemoral pain syndrome,[2] and abnormal pelvic tilting especially in sitting. The lumbar curve is decreased in this position.[3] A person with a disc protrusion or disc bulge, can have tight hamstrings[4] and sciatic pain can also be associated with the disc herniation which may be due to hamstrings tightness.[5] In Spondylolisthesis there are bilateral fractures in the pars interarticularis of the spine and severe tightness is present in hamstrings group.[6] The injury or any tightness in these structures can be treated well if other associated factors are also adequately addressed and dealt with. These factors include training errors and improper warm up.[7]

For diagnosis of hamstring tightness different physical methods like knee extension angle (KEA), sacral angle (SA), straight leg raise (SLR), and sit and reach (SR) can be used but the gold standard is active knee extension angle test (AKEA).[8] The angle of knee flexion represents hamstring tightness and can be measured with a goniometer after active knee extension with the hip stabilized at 90 degrees flexion while lying supine.[9]

Combining static stretching with spray technique, massage and dynamic stretching is an option. The treatment options used in this study were the DSTM and PS techniques. The DSTM was divided into hierarchical progressions and here the subject is in the prone lying position and few deep longitudinal strokes are applied to the entire muscle group and the area of tightness is located. When the specific area of tightness of hamstring muscle is located, the further treatment is limited to this target area. For dynamic intervention, the subject is in supine lying position with the knee and hip flexed to 90° and all the dynamic techniques are applied in a distal to proximal direction. Deep longitudinal strokes are applied to the area of hamstring tightness and the leg is passively moved to a position in which the hamstring is in lengthened position. Five strokes are applied to the area and shaking of the limb is performed for 20 seconds at the completion of this technique. Then the area of hamstring tightness is reassessed for reduction in muscle tightness.

If any improvement in the flexibility is indicated, then the

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next progressive dynamic technique is applied. However, if there is no reduction in the area of tightness, then treatment is stopped. The same sequence is applied for the next dynamic technique in which the subject is asked to actively extend his leg, so that reciprocal inhibition of the hamstrings can be achieved. In the final technique, the subject is asked to eccentrically work the hamstring muscle group to the end ROM and the therapist performs five deep distal to proximal longitudinal strokes over the area of muscle tightness at hamstrings[1] (Figure).

The aim of the study was to compare the effectiveness of Dynamic Soft Tissue Mobilization DSTM with Passive Stretching Technique to improve the flexibility of tight hamstrings in cricket players.

Methods and Results

The data for the study was collected from the players of different cricket clubs of Mandi Bahauddin District, Punjab, Pakistan. The study was of six months duration (February, 2015 to July, 2015).

A sample of total 120 male cricket players was taken with 8% margin of error on the basis of values about the significance of DSTM 39.7 ± (8.6).[1] Purposive sampling technique was used and two groups were allocated by using lottery method.

Male regular cricket players who were playing 3 years of playing cricket at least 5 days a week were included in this study with ages between 20-40 years and they were having major presenting complaint of tightness in posterior thigh or with limitation of Active Knee Extension Angle AKEA below 170° of knee extension. Players with positive slump test, with acute hamstring injury, having complaint of pain or injury in back, knee or hip joint or stiffness in knee joint were excluded from the study.

Data was collected in two steps. In the first phase different registered cricket clubs in Mandi Bahauddin District were visited and the players were interviewed and assessed for hamstring tightness; measurement of Active Knee Extension Angle AKEA with goniometer was used as an indicator of hamstring flexibility range. In the second phase of data collection the subjects with limitation of AKEA below 170° of knee extension were enrolled in this study.

Figure: Using the surface area of the proximal phalanges of the fist to Perform longitudinal strokes in the dynamic position.

The subjects were divided into two groups using lottery

Table-1: Group statistics of active knee extension angle.

	Treatment	N	Mean	Std. Deviation	Std. Error Mean
Active Knee Extension Angle : Pre-Treatment Score Deficient to 180 Degree	Dynamic Soft Tissue Mobilization(DSTM)	60	25.6667	6.90288	0.89116
	Passive Stretching Technique (PS)	60	25.4667	8.59339	1.1094
Active Knee Extension Angle : Post-Treatment Score Deficient to 180 Degree	Dynamic Soft Tissue Mobilization(DSTM)	60	10.8167	4.30014	0.55515
	Passive Stretching Technique (PS)	60	18.6333	7.06859	0.91255

◆ Group A was treated with Dynamic Soft Tissue Mobilization (DSTM)
◆ Group B was treated with Passive Stretching Technique (PS).

method. In group A subjects received DSTM and in group B received Passive Stretching Technique PS. Prone lying for 5 minutes was introduced as standard treatment for both groups. First reading was taken before the first treatment session and final reading was taken after 4 treatment sessions in which the individuals got one treatment session weekly. Data was analyzed using SPSS 16 software. Mean and standard deviation were taken for quantitative data. Independent t-test was applied with a p- value < 0.05.

The mean age of players was 32±4.54 years and had atleast 3 years experience of playing cricket. The mean value of (AKEA), pre-treatment score deficient to 180 degrees in case of DSTM was 25.66 ± 6.90, and that of PS was 25.46 ± 6.89, while the mean value of (AKEA), post-treatment score deficient to 180 degrees in case of DSTM was 10.81 ± 4.30, and that of PS was 18.63 ± 7.06. The mean value of (AKEA), post-treatment score deficient to 180 degrees in case of DSTM was statistically lower as compared to PS groups. (pvalue < 0.05).

Conclusion

It can be concluded by the results of this study that both of the techniques are effective but dynamic soft tissue mobilization (DSTM) produces better results than PS to improve the hamstring flexibility in cricket players.

Due to limited time and resources we restricted the study to only the cricket players of one district of Pakistan. Further large scale research on different sports players should be carried out. Physical Therapists are recommended to use this technique DSTM for the players with tight hamstrings because there is no risk of injury and quick results are found. It is also less time consuming in a sense that all the work is done on a specific tight area of muscle.

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Conflict of Interest: None.

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