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A Study to Compare the Effectiveness of Active Stretching Exercises with Cryotherapy versus Passive Stretching Exercises with Cryotherapy in Itband Friction Syndrome with Adults

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Abstract: ***Iliotibial band friction syndrome (ITBFS) is an inflammatory non - traumatic repetitive strain injury caused due to friction of the Iliotibial band over the lateral femoral epicondylar (LFE) prominence. It is commonly seen in male than female in the age group of 16 - 30 years. For the study 30 male athletics between the age group 16 - 30 years were recruited. The subjects were screened for eligibility to participate in the study and regarding the study. The subjects were explained the purpose of the study and their role in the study. Group A divided into 15 subjects who received Active stretching exercise with cryotherapy. Group B divided into 15 subjects who received passive stretching exercise with cryotherapy. Study Duration: 6 weeks, weekly 3 days, 2 sections. The intra - group analysis showed that both Treatment A and Treatment B are significantly effective in reducing the values of VAS (Right and Left) and increasing the values of BBS (Right and Left). However, the inter - group analysis compared the two treatment groups in terms of changes in all the four outcome measures and the corresponding result showed that Treatment B is significantly effective than Treatment A in terms of mean increase in BERG BALANCE SCALE (BBS), while there is no significant difference between two treatment group in terms of mean reduction in VAS (right and left). Hence, we conclude that Treatment B is effective than Treatment A in terms of improvement in BBS score (right and left) in ITBAND FRICTION SYNDROME with adults.***

Keywords: Cryotherapy, Stretching, Iliotibial band

1. Introduction

Iliotibial band friction syndrome (ITBFS) is an inflammatory non - traumatic repetitive strain injury caused due to friction of the Iliotibial band over the lateral femoral epicondylar (LFE) prominence. It is commonly seen in male than female in the age group of 16 - 30 years that affects both the side bilateral or unilateral. It is generally accepted that ITBFS is most common injury of the lateral knee, with an incidence between 1.6 and 12%. It comprises 22% of lower extremity injury. There are so many causes for Iliotibial band friction syndrome. They are downhill runners and downhill skiers, cyclist, long distance runners, military personnel undergoing training, football players, weight lifters are commonly suffering from Iliotibial band friction syndrome. There are other causes like the abnormal pronation of the ankle joint may cause greater than internal rotation of the tibia, accompanied by increased tension on the ITB at its insertion posterior Gerdy's tubercle. There are various physiotherapy treatment modalities are available for treatment Iliotibial band friction syndrome.

Iliotibial band friction syndrome (ITBFS) is one of the many different causes of lateral knee pain. It was first seen in US Marine Corps recruits during their training in 1975 and has been diagnosed frequently in long distance runners, cyclist, skiers, and participants of hockey, basketball, and soccer since then, these activities all depends on the rapid and prolonged cycling of the knee through flexion and extension. The ITB functions as a knee extensor when the knee is less than 30 degrees of flexion but becomes a knee flexor after exceeding 30 degree of flexion. The ITB has been postulated to acquire a more posterior position relative to the lateral femoral condyle with increasing degrees of flexion.

The Active stretching exercise, also known as static active stretching exercise, uses your own muscles to provide resistance. With an active stretch, your moving or contracting one muscle to stretch another and as you're using your own muscles, there's no external force like equipment or other people required. Active stretching, also known as static active stretching, uses your own muscles to provide resistance with an active stretch, you're moving or contracting one muscle to stretch another and as you're using your own muscles there's no external forces like equipment or other people required.

"Active stretching involves reciprocal inhibition". Explains kuharik "that's when one muscle called the agonist, is used to stretch the opposing muscle, which is known as the antagonist" And the like lipoid often injury while active stretching is low. Your body won't allow or force you to go beyond a point that you can't handle.

Stretching is a general term used to describe any therapeutic maneuver designed to increase the extensibility of soft tissues, there by improving flexibility by elongating (lengthening) structures that have adaptively shortened and have become hypomobile over time. Passive stretching is a therapist applies an external force to move the involved body

segment slightly beyond the point of tissue resistance and available ROM. The therapist manually controls the site of stabilization as well as the direction, speed, intensity, and duration of stretch. It can be performed passively, with assistance from the patient or even independently by the patient.

The Cryotherapy is a treatment where your health care provider applies extreme cold to freeze and destroy abnormal tissue. Cryotherapy can be used to treat a variety of skin conditions and some cancers, including prostate and liver cancer, including prostate and liver cancer. This therapy can treat tissue externally (on the skin) and internally (inside the body).

Cryotherapy is a minimally invasive therapy. This type of treatment removes damage or diseased tissue that comes from a variety of medical conditions. Cryotherapy is usually done without open surgery. Most people recover quickly from the procedure and with little pain, your provider might recommend.

2. Materials and Methodology

Source of Data:
Data will be collected from the sports player. The players will be included in the study based on the fulfillment of Inclusion criteria. The purpose of the study will be explained to all the subjects and consent from each subject will be obtained, the subjects were randomly assigned.

Sampling Size:
For the study 30 male athletics between the age group 16 - 30 years were recruited with mild iliotibial band tightness with active knee extension more than 30 degree. The subjects were screened for eligibility to participate in the study and regarding the study. They subject explained the purpose of the study and their role in the study.

Group A: Group A divided into 15 subjects who received Active stretching exercise with cryotherapy in IT Band friction syndrome with adults.

Group B: Group B divided into 15 subjects who received passive stretching exercise with cryotherapy in IT Band friction syndrome with adults.

Study Duration: 6 weeks, weekly 3 days 2 sections.

Sampling Criteria

Inclusion Criteria: Grade 2 and 3 injury of ITBFS, Individuals with localized LFE pain, Worst pain at Iliotibial band during downhill run, Individuals with sudden onset of pain after a long distance runners, Age group between 16 - 30 years, Positive modified Thomas test, Positive treadmill running test, Cognitive capability, Patient with lateral knee pain, Gender both male and female.

Exclusion Criteria: Grade 1, 4 and 5 injury of ITBFS, Unwilling athletes for the treatment, Allergic skin to ice and tape, Any old femur fracture, tibial fracture and chondromalacia patella, Bilateral ITBFS, Any cardiac, lung and renal problems, Patient with recent knee surgery, Patient with metal implant, Patella femoral pain, Degenerative joint disease.

Parameter of the Study: Visual Analogue Scale (VAS) and Berg Balance Scale (BBS).

3. Procedure

Group A - Active Stretching Exercises:

Forward Fold with Crossed Legs:
The forward fold stretch helps relieve tension and tightness along your IT Band. You'll feel a stretch along the muscles on the side of your thigh as you do it. To stretch more deeply, place all of your weight onto your back foot. Use a block or prop under your hands if they don't reach the floor, or if you have any low back pain. If you have concern with blood coming to your head, keep your back flat and your head raised.

Technique:
Stand with your feet hip distance apart. Cross your left foot over your right, aligning your pinkie toes as much as possible. Inhale and extend your arms overhead. Exhale as you hinge forward from your hips, and lengthen your spine to come into a forward bend. Reach your hands towards the floor and elongate the back of your neck. Keep your knees slightly bent.

The Standing Itb Stretch:
The standing ITB stretch is good because you can do it anywhere at home, the office, or the gym before working out, you can lean on a wall for balance if it is easier.

Technique:
Stand upright. Cross the involved leg BEHIND the opposite leg. Lean to the uninvolved side (away from the sore side) until you feel a stretch across the affected Iliotibial band. Hold for 30 seconds. Uncross your legs and stand up straight again. Repeat four more times. Some people feel a stretch in the area of their hip where the ITB arises, while others feel a tightness at their knee during this stretch.

Seated Spinal Twist:
This stretch relieves tightness in your spine, hips, and outer thighs. It opens your shoulders and chest, allowing for improved posture and stability.

Technique:
From a seated position on the floor, bend your left leg and place your left foot on the outside of your right hip. Bend your right leg and place your right foot flat on the floor on the outside of your left thigh. Exhale as you twist your lower body to the right Place your left fingertips on the floor, bending your hips. Wrap your elbow around your knee, or place your elbow to the outside of your knee with your palm facing forward. Gaze over your back shoulder.

Cryotherapy:

Duration: 5 - 10 minutes

Group B - Passive Stretching Exercises:

Patient Position:
Place the patient in a side - lying position with the hip to be stretched uppermost. Flex the bottom hip and knee to stabilize the patient

Hand Placement and Procedure:
Stabilize the pelvis at the iliac crest with your proximal hand. With the knee flexed, extend the patient's hip to neutral or into slight hyperextension, if possible. Moving the hip into a small amount of flexion and abduction prior to extending it may help Orient the IT Band for the stretch. Let the patient's hip adduct with gravity and apply an additional stretch force with your other hand to the lateral aspect of the distal femur to further adduct the hip.

Cryotherapy:

Duration: 5 - 10 minutes

Statistical Methodology:

t - Test: Two - Sample Assuming Equal Variances		
	A_VAS_Right_Diff	*B_VAS_Right_Diff*
Mean	**-4.73**	**-5.13**
SD	**0.46**	**0.74**
Observations	15	15
t Stat	**1.77**	
P (T<=t) two - tail	**0.087**	

t - Test: Two - Sample Assuming Equal Variances		
	A_VAS_Left_Diff	***B_VAS_Left_Diff***
Mean	**- 4.73**	**- 5.13**
SD	**0.46**	**0.74**
Observations	15.00	15.00
t Stat	**1.77**	
P (T<=t) two - tail	**0.087**	

t - Test: Two - Sample Assuming Equal Variances		
	A_BBS_Right_Diff	*B_BBS_Right_Diff*
Mean	**8.87**	**13.53**
SD	**2.95**	**3.42**
Observations	15.00	15.00
t Stat	**- 4.00**	
P (T<=t) two - tail	**0.000**	

t - Test: Two - Sample Assuming Equal Variances		
	A_BBS_Left_Diff	*B_BBS_Left_Diff*
Mean	8.8	13.53
SD	2.83	3.42
Observations	15	15
t Stat	-4.13	
P (T<=t) two - tail	0	

4. Discussion

Muscular flexibility is an important aspect of normal human function. It is generally Defined as range of motion around a joint or group of a joints and reflex the ability of the muscle tendon to elongate. It has long been recognized as an important component of physical fitness and rehabilitation and is widely conjectured the benefits of good Flexibility include reduction and prevention of injury risk and enhanced sports Performance.

Group A: To find out Active stretching exercises with cryotherapy:
The baseline mean difference of VAS for Active stretching exercises with cryotherapy was 36.33. After the end of three weeks the mean value of A VAS has decreased from 6.67 to 1.93., he paired t test done in comparison of pre and Post - test means scored showed that: t = 40.05, p=0.000<0.05).

The baseline mean difference of BBS for Active stretching exercises with cryotherapy was 4.53. After the end of three weeks the mean value of BBS has increased from 36.60 to 45.47. The paired t test done in comparison of pre and Post - test means scored showed that: t = - 11.65, p = 0.000 < 0.005)

According to Vijay Kage et al International journal of physiotherapy Research has Conclude that single intervention of ART and Mulligan BLR technique is effective in Improving Popliteal angle and Sit and reach flexibility measurements but ART has Shown better improvement in hamstring flexibility and ROM than Mulligan BLR.

According to James w George, Andrew C Tunstall, Rodgere Tepe, et al Journal of Manipulative and physiological therapeutics Our results suggest that a single session Of ART may increase IT band flexibility in asymptomatic male participants. Future Research should compare ART with previously studied interventions such as stretching, and massage.

Group B To find out the Passive stretching exercises with cryotherapy:
The baseline mean difference of VAS for Passive Stretching exercises with cryotherapy was 6.67, After the end of three weeks the Mean value of VAS has decreased from 6.67 to 1.93. The paired Test done in comparison of pre and post - test means scored showed that: t= 40.05, p = 0.000<0.05)

The baseline mean difference of BBS for Passive Stretching exercises with cryotherapy was 4.23 After the end of three weeks the Mean value of BBS has increased from 36.60 to 45.40 The paired t test done in comparison of pre and post - test means scored showed that: t = - 12.03, p = 0.000<0.05.

According to Yuichi Nishikawa, Junya aizawa, et al Journal of physical therapy Science This study reveals that there is a significant improvement in the IT Band Flexibilities of the active and passive stretching groups compared with the control Group.

According to D Scott Davis, Paul E Ashby et al has concluded that significant Interactions of stretching technique and duration of stretch. Post Hoc analysis showed That all three stretching technique increased IT Band length from the baseline value During a 6 week training programed.

Comparing the Values of Group - A and Group - B:
On comparison between the two group of A and B based on influence from table 7 and 8, the P value was found to be statistically significant for Treatment Group B than treatment Group A in terms of VAS & BBS.

There is significant difference between two treatments [A (8.93) and B (7)] in terms of average improvement in Active Release Technique (t = 1.77,) Where the P value is (p = 0.087 > 0.05).) In addition, the mean Improvement in the value of VAS by Treatment B is greater than that of Treatment A.

There is significant difference between two treatments [A (2.9) and B (2.27)] in terms of average improvement in Active Release Technique (t = - 4.13,) Where the P value is (p = 0.000<0.05).) In addition, the mean Improvement in the value of BBS by Treatment B is greater Than that of Treatment A.

According to Gopi Mistry, Neeta J Vyas et al has concluded Active stretching exercises with cryotherapy Technique improves IT Band flexibility and reduce pain and Diability over time.

According to Sharddha Kothawale, Keerthi Rao et al has concluded Active stretching exercises with cryotherapy Technique can be used as an effective physiotherapeutic Intervention in reducing IT Band tightness instantly

5. Conclusion

The intra - group analysis showed that both Treatment A and Treatment B are significantly effective in reducing the values of VAS (Right and Left) and increasing the values of BBS (Right and Left). However, the inter - group analysis compared the two treatment groups in terms of changes in all the four outcome measures and the corresponding result showed that Treatment B is significantly effective than Treatment A in terms of mean increase in BERG BALANCE SCALE (BBS), while there is no significant difference between two treatment group in terms of mean reduction in VAS (right and left).

Hence, we conclude that Treatment B (PASSIVE STRETCHING EXERCISES WITH CRYOTHERAPY) is effective than Treatment A (ACTIVE STRETCHING EXERCISES WITH CRYOTHERAPY) in terms of improvement in BBS score (right and left) in ITBAND FRICTION SYNDROME with adults.

6. Limitations and Recommendations

Limitations: Sample size is small, Shorter duration of the study and no long term follow up of the patients.

Recommendations: A large sample size can be taken. A study can be done with comparing other technique and also using control group. Longer study durations and follow up can be done to assess long term benefits. In future studies, different technique can be used to improve the muscle flexibility. Different age group can be included.

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