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Research Article

Effect of Gait Retraining in Runners with Iliotibial Band Syndrome

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Abstract

Iliotibial band syndrome (ITBS) is an inflammatory, non traumatic, knee overuse tendon injury of the iliotibial band in athletes. Friction in the band develops in the activities involving repetitive knee flexion. Gait retraining is vital in patients with iliotibial band syndrome in reducing its symptoms. Current researches reveal that cadence manipulation influences on both running mechanics and impacting forces. 30 athletes who fulfilled the predetermined selection criteria were selected and divided into two groups. Group A- Received gait retraining along with hip abductor strengthening and ultrasound therapy for thrice a week for 6 weeks. Group B-Received only hip abductor strengthening exercises and ultrasound therapy for thrice a week for 6 weeks. The pre test and post test data were analyzed using Paired and unpaired t test were used as statistical tools and the results showed the group A in which the athletes received gait retraining along with the hip abductor strengthening and ultrasound therapy showed significant improvement. Thus inclusion of gait retraining in the treatment protocol of iliotibial band syndrome will be effective in improving the performance of the athletes and early recovery.

Keywords: Iliotibial band Syndrome; Runners; Gait Retraining; Lower Extremity Functional Scale; Hip Abductor Strengthening; Ultrasound therapy

Abbreviations

ITBS: Iliotibial Band Syndrome; LEFS: Lower Extremity Functional Scale

Introduction

Iliotibial band syndrome (ITBS) is an inflammatory, non traumatic, knee overuse tendon injury of the iliotibial band in athletes. Characterized by pain on the outer aspect of the knee in close relation to the lateral femoral condyle and aggravated by repetitive motion of the knee. One third of the condition is the routine running injury of the lateral knee, with an incidence between 1.6 and 12% [1]. Friction in the band develops with the activities of repeated knee flexion. The iliotibial band shifts forward and backward over the lateral femoral condyle, causing friction and resulting in inflammation [2]. This friction is greatest at 20-30 degrees of knee flexion that occurs at the early portion of

stance phase of running. Athletes with it have significantly greater hip adduction and knee internal rotation. These motions create high strain to band as it attempts to decelerate hip adduction and knee internal rotation causing compression of its distal aspect against the lateral femoral condyle [3]. Gait retraining is vital in athletes with iliotibial band syndrome in reducing its symptoms. Current researches reveal that cadence manipulation influences on both running mechanics and impacting forces. The components of running mechanics were improved including decreased heel strike, decreased braking impulse, decreased step length and decreased vertical excursion [13]. This also significantly reduces the impact forces when comparing a runner's preferred step rate to 5% or 10% slower than preferred. Several physical therapy modalities have been utilized for treatment of iliotibial band syndrome. But ultrasound therapy reduces pain over the inflamed area. Therapeutic ultrasound enhances circulation to the injured area thereby reducing the inflammation, increasing the flow of nutrients and growth factors that promotes early tissue healing [4]. As there are no researches found to our knowledge that includes the gait retraining along with hip abductor strengthening and ultrasound therapy in the treatment of iliotibial band syndrome in runners there is a need to fulfill it. Thus the study aimed to find the effect of gait retraining in runners with ilitotibial band syndrome.

Materials and Methods

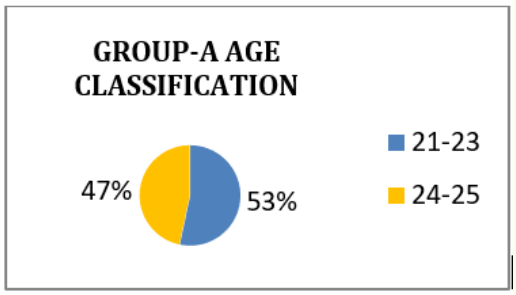
All Athletes with iliotibial band syndrome who visited outpatient department of physiotherapy, KG physiotherapy and Rehabilitation centre were selected for this study. Out of which 30 athletes who fulfilled the inclusion criteria of the following: athletes diagnosed with iliotibial band syndrome, Only male athletes were selected, age group in between 20-25 years, athletes who participated in college athletic events and exclusion criteria include athletes with unaffected side lateral knee pain, postural deformities in knee, recent iliotibial band injury of 4^{th} and 5^{th} grade were not selected. They were divided into two groups. A clear explanation was given to every athlete about the procedures and return consent was obtained. Pre test on functional ability of knee is taken using lower extremity functional scale. Group A- Received gait retraining along with hip abductor strengthening and ultrasound therapy for thrice a week for 6 weeks. Group B-Received only hip abductor strengthening exercises and ultrasound therapy for thrice a week for 6 weeks. The gait retraining program includes running gait retraining with step rate manipulation. Physical evaluation of the subjects revealed palpation tenderness at the distal iliotibial band of the lateral knee. The athletes were instructed to run at a self selected pace of 6.5 mph. The athletes continued to run for several minutes and verbalized when a comfortable pace with typical form is reached. Digital video was then taken from the rear side by the evaluating physical therapist. Cadence was then assessed by counting each time the right foot hit the ground for 30 seconds and this number was then multiplied to calculate the total steps per minute at 168. The video was then viewed with the athletes at both regular and slow motion speeds. Primary instruction was given to increase the step rate during running at the same pace of 6.5 mph. The athletes were trained on treadmill for several times to increase the step rate. Along with hip abductor strengthening exercises were given using TheraBand at ankles. Instructions were given for practicing this running form at home with a goal of achieving increased steps. Now, the subjects then proceeded to run at the 6.5 mph pace.

At 6 weeks after the initial evaluation the athletes reported compliance with all recommendations and had been successful running upto 3.5 miles without knee pain. At that time running mechanics were re assessed with video of cadence was assessed at 176 steps per minute. These improved running mechanics of decreased impact forces present with running. Hip abductor strengthening include: forward and backward walking and side lying abduction with blue colour thera band. Ultrasound therapy is given to the lateral aspect of knee at the pain region. Position of patient: Side lying with affected knee supported on pillow. Mode: Continuous mode Intensity: 1.2 w/cm. Frequency: 1 mhz Duration:8 minutes. Post test was taken and assessed.

Results and Discussion

Table 1,2 shows the age classification of group A and group B

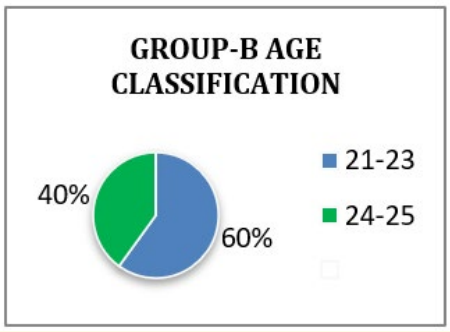
The unpaired t test analysis for the post test variables of both groups on functional ability using LEFS scale is shown in table. There was a significant difference shown between the groups. Subjects in Group A show superior mean difference than Group B. The t value for the post test variables for both groups is 17.2952.



Graph 1: Group A- Age Classification.

Age	No of persons
21-23	8
24-25	7

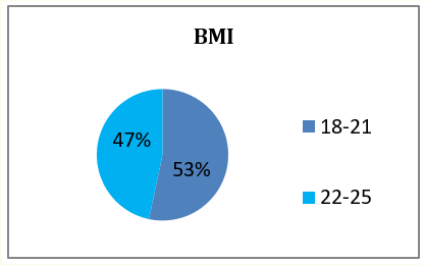
Table 1: Group A-Age Classification.



Graph 2: Group B -Age classification.

Age	No of persons
21-23	9
24-25	6

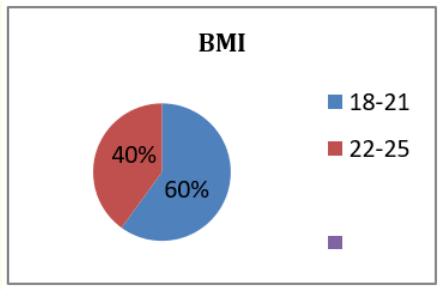
Table 2: Group B -Age Classification.



Graph 3: BMI – Group A.

BMI	No of persons
18-21	8
22-25	7

Table 3: BMI OF Group A.



Graph 4: BMI of group B.

BMI	No of persons
21-23	9
24-25	6

Table 4: BMI of group B.

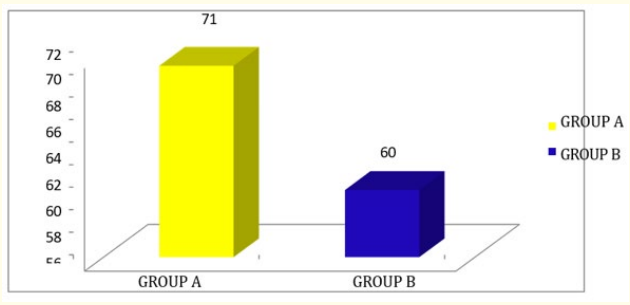
The comparative mean values, mean difference, standard deviation and unpaired t values of Group A and Group B.

S. no	Group	Mean	Mean difference	Standard deviation	T' value
1	Group A	71.083	11.0833	3.805	2.9129
2	Group B	60.0			

Table 5

The table 3 shows analysis of LEFS scale on unpaired t test. The post test values of Group A and Group B was 2.9129 at 0.05% level of significance, which was greater than the tabulated t value 2.048. The results shows that there was marked difference between Group A and Group B.

Iliotibial band syndrome (ITBS) is a non traumatic, knee overuse tendon injury in athletes characterised by pain on the



Graph 5

outer aspect of the knee in close relation to the lateral femoral epicondyle that is poorly localised and aggrevated by repetitive motions typically in runners, cyclists or other athletes by running long distance. Studies have demonstrated that weakness of lateral gluteus muscle is a causative factor in this injury. There is a decreased ability to stabilize the pelvis and eccentrically control femoral abduction. As, a result the other muscles must compensate, often leading to excessive soft tissue tightness and myofascial restriction. Gait retraining plays a major role with recent research revealing that, when assessing the effects of cadence manipulation on both running mechanics and impact forces by increasing step rate above a runners preferred by 5% and 10%, the components of running mechanics were improved including decreased heel strike, decreased braking impulse, decreased step length and decreased vertical excursion. There was also a significant reduction in impact forces when comparing runners preferred step rate to step rates 5% or 10% slower than preferred.

Several physical therapy modalities have been utilized for treatment of iliotibial band syndrome. But ultrasound therapy reduces pain, enhances circulation to the injured area and reduce the inflammation. This increases the flow of nutrients and growth factors and promotes tissue healing and regeneration.[4] Hip abductor strengthening exercises plays a role in correcting the adduction torque of the lower extremity that improves the mobility of the band and reducing it friction with lateral femoral condyle iliotibial band syndrome [5-19]. Thus the group A athletes received gait retraining along with hip abductor strengthening exercises and ultrasound therapy in our study showed significant improvement than the Group B athletes received only hip abductor strengthening exercises and ultrasound therapy.

Conclusion

Based on the statistical analysis the result of the study shows that the gait retraining has shown significant improvement in the functional ability in runners with iliotibial band syndrome.

Conflict of Interest

I Declare no financial interest or any conflict of interest.

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