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ANALYSING IMMEDIATE AND CARRY OVER EFFECTS OF PRIMAL REFLEX RELEASE TECHNIQUE ON ILIOTIBIAL BAND TIGHTNESS IN KNEE PAIN PATIENTS

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ABSTRACT **Background/Purpose:** This study aims to investigate the effectiveness of PRRT treatment in treating knee pain patients with ITB tightness, focusing on significant changes in ITB length. **Methodology:** A sample size of 30 subjects were selected for the study based on inclusion and exclusion criteria. The participants were randomly divided into experimental and control groups. The patients in the experimental group were given PRRT treatment whereas in control group, conventional treatment was given. The outcome measures used were VAS, Ober's test, Muscle length testing of ITB with inch tape and SI joint mobility test. **Results:** On comparing between groups, experimental group was better that the control group which was statistically significant ($p<0.005$). **Conclusion:** The use of PRRT resulted in decreasing pain, improving muscle length of ITB and SIJ dysfunction. The PRRT concluded to be very useful in decreasing symptoms as an immediate effect.

KEYWORDS : Knee pain, Iliotibial band tightness, Sacroiliac joint dysfunction, Primal reflex release technique.

INTRODUCTION

Knee pain affects 25% of adults worldwide, affecting movability, function, and quality of life. Factors include age, BMI, injury, knee alignment, and structural involvement like iliotibial band involvement. [1,2]

Knee pain can be caused by iliotibial band tightness or friction syndrome, a fascial condition involving the iliotibial band, which extends from Tensor fascia lata to Gluteus Maximus.[3]

Iliotibial band syndrome is a typical injury that occurs in runners, cyclists, dancers, and tennis players, is a chronic compression of underling tissue, often resulting in lateral knee pain.[4,5]

ITB tightness is a clinical issue resulting from various musculoskeletal conditions, including arthritis, femoral retroversion, internal tibial torsion, excessive foot pronation, hip abductors weakness, and muscle imbalance.[6]

Studies indicate that lower extremity complaints often indicate SI joint and lumbar spine mechanical dysfunction, either symptomatic or asymptomatic, because of the illum, sacrum, and lower back's fascial connections.[7]

Research indicates Regional Interdependence, a seemingly unrelated impairment in a remote anatomical region, is crucial in assessing SI joints in knee pain patients. [8,9]

The lumbodorsal fascia, gluteal fascia, fascia lata, and anterolateral knee are among the structures that the iliotibial band attaches to, suggesting a coordinated effort by the lumbar spine, hip, femur, and knee. [7]

The treatment for Iliotibial bands involves stretching, strengthening hip musculatures, and manual therapy like myofascial release with a foam roller to facilitate lengthening and reduce tension.[10,11,12]

In contrast a newer therapy approach called PRRT therapy aims to reset ITB tension and length by resetting muscle imbalances between vastus lateralis and medialis muscle groups, improving SI joint mobility.[13]

SI joint and IT band stiffen and hypomobile to protect hip and knee joints, mediated by hyperactive protective reflexes in spinal cord and brain stem. PRRT focuses on relaxation and normal musculoskeletal function.[13,14]

PRRT is a treatment method that uses reciprocal inhibition to target and reset reflexes, aiming to reduce pain and muscle spasm.[13]

PRRT enhances afferent activity from mechanoreceptors in agonist and antagonist muscles, leading to neurological downregulation of muscles.[15]

PRRT treatment uses 12 seconds of light, swift deep tendon reflexes to stimulate the skin, tendons, and muscles to inhibit painful areas, typically performed lightly and repeatedly.[14,15]

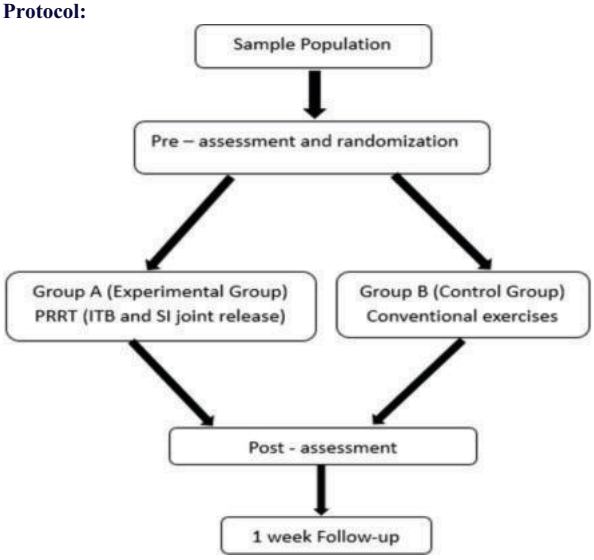
This research attempts to investigate the efficiency of PRRT treatment in treating knee pain patients with ITB tightness, focusing on significant changes in ITB length.

METHODS

Study Design, Settings, And Participants

The experimental study conducted in Physiotherapy OPD of Himalayan Institute Hospital Trust, Jolly grant, Dehradun.The study included a total of 30 subjects, selected based on inclusion and exclusion criteria. The inclusion criteria included both the genders aged between 20-50 years which were having knee pain and positive ober's test. Subjects who had a history of recent fracture, Tumors,undergone any lower extremity surgery, and those with any lower extremity neurological condition were not included in the study.The outcomes measures used in this study were VAS score,Ober's test, Muscle length testing (with inch tape).

Protocol:



Procedure

Individuals were chosen based on inclusion and exclusion standards. Pre – assessment was taken. Therapist assessed the IT band by palpating the tautness and tenderness over the course of IT band and by performing Ober's test.

The therapist also assessed SI joint yielding by providing P-A mobilization on affected side.

Ober's Test
The afflicted side was facing up while the patients lay sideways.

The lumbar curve was flattened by flexing the bottom knee and hip.

The patient's pelvis was securely stabilized by the therapist, who stood behind them to stop any further movement.

The patient's upper leg is then passively extended and abducted by the therapist while the patient's knee remains straight.

If a contracture existed, the leg stayed abducted and did not fall to the table as the examiner carefully lowered the lower limb.

The examiner then measured the muscle length (ITB) by using Inch tape, Subjects were in same position as in Ober's test and the distance between the medial border of patella and the support surface was measured.

Sacroiliac Joint Spring Test
The therapist also assessed SI joint mobility by providing P-A mobilization on both SI joint to compare mobility of both sides.

The patient was in a supine position with both knees bent at a 90-degree angle. The therapist applied P-A mobilization while maintaining the tips of her fingers over both SI joints. A scale from zero to six was employed.
0 = Ankylosing or not observable movement
1 = significant mobility limitations
2 =Mild mobility restriction
3 =Normal
4 = A tiny bit more mobility
5= A noticeable rise in mobility
6 = Unstable

Patients meeting the inclusion and exclusion criteria were explained of the treatment interventions following which the consent was taken;Through random sampling, patients were split into two groups: group A was the experimental group and group B was the control group.

Patient of interventional group (Group A) were given PRRT treatment and control group (Group B) were given conventional treatment.

(Group A) Prrt Technique (ITB Release)
Patient lied supine on the treatment table.
Therapist stood on affected side and placed 2 fingers over the knee joint and asked the patient to isometrically initiate quadriceps contraction. (10% of total force).

As the patient contracts, the therapist started tapping over the fingers at 45 degree angle for 12 sec.

Therapist performed this technique 3 times and then again checked for ITB tightness or tenderness.

Release of Ipsilateral SI Joint
Patient lied supine on the treatment table
Patient placed the affected limb out of the couch and hooked the ankle in with the treatment table
Patient then asked to produce a slight isometric contraction by adducting the affected leg
Therapist then stimulated the medial side by tapping above and below knee joint at same time for 12 sec
Therapist performs 3 sets of the technique for 12 seconds.

Control Group (group B) Received Conventional Treatment;
Which included Ultrasound with a dosage of 1MHz in frequency continuous mode and 0.8W/cm2 of intensity for 7 min.

Isometric exercises of quadriceps and hamstring and Iliotibial band stretching. Every exercise was repeated 10 times in 3 sets.

Data Analysis
In this study, descriptive statistical analysis has been performed.Intra and inter group analysis was done among the groups. Graphical presentation of variables are shown to understand the result clearly. A significance threshold of $p<0.05$ was applied. A hypothesis is considered statistically significant if the significance level is less than 0.05, and statistically insignificant if the level is more than 0.05.

Statistical test: Normality was checked by shaipro wilk test. Mann whitney U test was used to find out significance differences among variables in between intra-inter groups. Paired t-test was use to find out significance differences of VAS variable within the groups. Wilcoxson signed rank test was used to find out significance differences of muscle length (ITB) variable within the groups.

Result
Comparison Of Variables Within The Group A
Table 1: Comparison Of Pre-post Treatment Variables Within Group A

Variables	Pre	Post	P- value
VAS	6.53±1.246	4.07±1.486	.001
Muscle length	7.967±2.0219	4.200±3.2831	.001

In Group A, the mean and standard deviation of pre VAS was 6.53±1.246 which was reduced to post VAS score of 4.07±1.486 (Statistically significant, P value <.001) the mean and standard deviation of pre muscle length was 7.967±2.0219 which was changed to 4.200±3.2831 (Statistically significant, P value <.001).

Table 2: Comparison of post- carry over effects of variables within Group A

Variables	Post	Carry over	P-value
VAS	4.07±1.486	3.47±1.685	.095
Muscle length	4.200±3.2831	3.900±3.0776	.024

In Group A, the mean and standard deviation of post VAS was 4.07±1.486 which was further reduced after 1 week follow up, the score was 3.47±1.685 (Statistically significant, P value <.095) the mean and standard deviation of post muscle length was 4.200±3.2831 which was further changed to 3.900±3.0776 after 1 week follow up (Statistically significant, P value <.024).

Comparison Of Variables Within The Group B
Table 3: Comparison Of Pre-post Treatment Variables Within Group B

Variables	Pre	Post	P- value
VAS	6.87±1.125	6.53±1.246	.025
Muscle length	8.600±2.2297	8.400±2.3238	.334

In Group B, the mean and standard deviation of pre VAS was 6.87±1.125 which was reduced to post VAS score of 6.53±1.246 (Statistically significant, P value <.025) The mean and standard deviation of pre muscle length was 8.600±2.2297 which was changed to 8.400±2.3238 (Statistically insignificant, P value >.334).

Table 4 : Comparison of post- carry over effects of variables within Group B

Variables	Post	Carry over	P-value
VAS	6.53±1.246	6.67±1.291	.414
Muscle length	8.400±2.3238	8.533±1.9952	.582

In Group B, the mean and standard deviation of post VAS was 6.53±1.246 which was further increased after 1 week follow up, the score was 6.67±1.291 (Statistically insignificant, P value >.414). The mean and standard deviation of post muscle length was 8.400±2.3238 which was further slightly changed to 8.533±1.9952 after 1 week follow up (Statistically insignificant, P value >.582)

Comparison Of Variables In Between Group A And Group B
Table 5 : Comparison Of Pre-treatment Variables In Between Group A & B

Variables	Group A	Group B	Man Whitney U test/T test	P-value
VAS	6.53±1.246	6.87±1.125	92.500	.412
Muscle length	7.967±2.0219	8.600±2.2297	94.000	.461

In comparison of Pre treatment variables between Group A and Group B, The mean and Standard deviation of pre VAS in group A was 6.53±1.246 and the mean and standard deviation of pre VAS in group B was 6.87±1.125 which was statistically insignificant (P> .412). Whereas the mean and Standard deviation of pre muscle length in group A was 7.967±2.0219 and the mean and standard deviation of pre muscle length in group B was 8.600±2.2297 which was statistically insignificant (P> .461)

Table 6 : Comparison of post-treatment variables in between group A & B

Variables	Group A	Group B	Man Whitney U test/ T test	P-value
VAS	4.07±1.486	6.53±1.246	-4.926	0.001
Muscle length	4.200±3.2831	8.400±2.3238	32.500	0.001

Comparing Group A with Group B's post-treatment factors, Group A's post-VAS mean and standard deviation was 4.07±1.486, while group B's post-VAS mean and standard deviation was 6.53±1.246. These results were statistically significant (P<0.001). On the other hand, the post-muscle length in group A had a mean and standard deviation of 4.200±3.2831, while group B had a mean and standard deviation of 8.400±2.3238. These values were statistically significant (P>0.001).

Table 7: Comparison of carry over effects in between group A & B

Variables	Group A	Group B	Man Whitney U test/ T test	P-value
VAS	3.47±1.685	6.67±1.291	-5.926	0.001
Muscle length	3.900±3.0776	8.533±1.9952	22.00	0.001

When Group A and Group B's carryover effects were compared, the mean and standard deviation of the VAS in Group A was 3.47±1.685 and in Group B it was 6.67±1.291, both of which were statistically significant (P<0.001). In group A, the mean and standard deviation of muscle length were 3.900±3.0776, while in group B, they were 8.533±1.9952, both of which were statistically significant (P> 0.001).

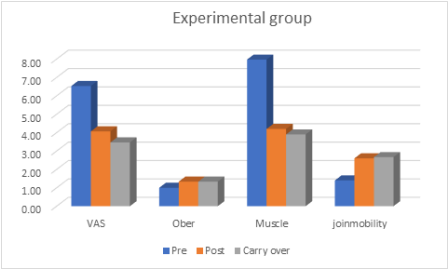


Fig 1: Pre, Post and Carry over data of Outcome measures in Experimental group.

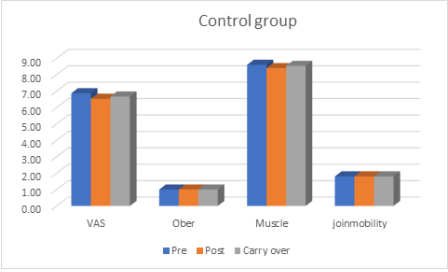


Fig 2: Pre, Post and Carry over data of Outcome measures in control group.

DISCUSSION

The current research was performed to evaluate the immediate and carryover effect of Primal reflex release technique on Iliotibial band tightness and knee pain. The results of this study showed that the experimental group (Group A) had a statistically significant improvement in both the VAS score and the muscle length of ITB, while the control group (Group B) also had a statistically significant improvement in the VAS score but not in the ITB muscle length variable.

The other variable was Ober's test, there were no change in Ober's test in control group but in experimental group, Out of 15 participants the Ober's test came negative in 5 participants whereas the muscle length of ITB were statistically improved in every participants involved in experimental group and was maintained after 1 week follow-up.

30 people were involved in this study, Out of which 22 people had an involvement of sacroiliac joint that came with the complaint of knee pain. This is similar to what Daniel W. Vaughn et al concluded in their study they describe the elimination of knee pain in a runner following manual therapy interventions for the sacroiliac region and symphysis pubis, showed the concept of regional interdependence.

In this study, we found that in those 22 people who had an involvement of SI joint usually had a hypomobile SI joint which was released using PRRT technique. The experimental group exhibited a statistically significant improvement in sacroiliac joint mobility as compared to the control group.

The present study is supported by Bethany L. Hansberger et al who aimed to find out the effects of PRRT on patients with Plantar Fasciitis. When compared to usual treatment, they discovered that the use of PRRT resulted in improvements in reported pain and dysfunction as well as a quicker time to resolution.

The application of PRRT in this trial reduced knee discomfort, enhanced ITB muscle length, and alleviated SJD. Although the long-term consequences of the Primal Reflex Release Technique are still unknown, it may be helpful in temporarily relieving symptoms.

Limitations

In the present study only one time intervention was introduced.

Future Study

It is necessary to conduct more studies on how PRRT affects pain and function over longer time periods.

CONCLUSION

In this study, we can conclude that the use of PRRT has both immediate and carry over effects in improving VAS score, muscle length of ITB and SI joint mobility in patients having knee pain.

However, on comparing the control and experimental group, we found that experimental group was more effective in improving VAS score, muscle length of ITB and SI joint mobility in patients having knee pain which was statistically proven.

Disclosures

a) **Conflict of interest-** No conflict of interest.
b) **Funding and financial support-** No funding provided.

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