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RESEARCH ARTICLE

Proximal to Distal Posture Correction Protocol For IT Band Friction Syndrome in Female Amateur Runners

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Abstract
Iliotibial band friction syndrome is an overuse knee injury that is more common in runners. In IT band syndrome, pain, and tenderness are present over the lateral aspect of the knee. It is more common in females because of physiological and anatomical factors. The objective of this research was to determine and compare the effect of proximal to distal postural correction protocol with conventional physiotherapy program for IT band friction syndrome in female amateur runners. This study included 150 female amateur runners with IT band friction syndrome based on inclusion and exclusion criteria. Then the subjects were randomly allocated into group A and group B by simple random sampling method. Group A was given proximal to distal postural correction protocol and for group B conventional physiotherapy exercise program was given. Outcome measures used were a visual analog scale, postural assessment, tenderness assessment by palpation and Ober's test. Pre and post-assessment of the above measures was taken to conform the results. The results showed a statistically significant effect of the proximal to distal postural correction protocol as compared to a conventional exercise program for IT band friction syndrome in female amateur runners. There was a significant reduction in pain (<0.0001) in individuals in group A than the group B. Postural abnormalities in IT band friction syndrome were also significantly (<0.0001) resolved and the Ober's test came as 76% negative out of 100%positive patients. Based on results, it was concluded that the proximal to distal postural correction protocol is effective in female amateur runners.

Keywords
Iliotibial Band Syndrome, Posture Correction Of Lower Limb, Physical Therapy, Running Injury.

INTRODUCTION

In the last 30 years, running has become a popular sport and participation in this sport has also increased because of which the incidence of running injuries is also increased (van der Worp and van der Horst, 2012). Running is one of the most common form of exercise and it comes with many physical and mental health benefits but can also cause injuries. In the aerobic exercises, running is associated with higher risk of overuse injury than the other forms such as swimming, walking and cycling (Francis and Whatman, 2019). As running is a weight bearing exercise, it works against gravity repetitively which leads to injuries.

The common cause of running injury is runners do "too much too soon". Iliotibial band syndrome has a 22.2% incidence of all lower extremity injuries in runners (Corey Beals and David Flanigan, 2013). It was first found in 1975 in US Marine Corp recruits during their training (Nurfadhilah and Yudhistira, 2023). Iliotibial band syndrome has a prevalence between 16% to 50% in females (van der Worp and van der Horst,

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2012).

The Iliotibial band is the distal fascial continuation of the tensor fasciae latae, gluteus medius, and gluteal maximus and inserts on the Gerdy tubercle of the lateral tibial plateau and partially to the supracondylar ridge of the lateral femur (Nurfadhilah and Yudhistira, 2023). Iliotibial band functions as a knee extensor when the knee is in less than 30 degrees of flexion and it becomes a knee flexor after exceeding 30 degrees offlexion. IT band and lateral epicondyle come in contact at the foot strike, when the knee is 30 degrees offlexion (Nurfadhilah and Yudhistira, 2023). IT band syndrome is an overuse injury caused by repetitive friction of the Iliotibial band and lateral epicondyle during knee flexion and extension that leads to inflammation of the contact area of IT band (Nurfadhilah and Yudhistira, 2023 and van der Worp and van der Horst, 2012). It is also called as 'runners knee' (Friede and Innerhofer, 2021). ITBS is also found in cyclists, soccer players, field hockey players, basketball players, and rowers. ITBS can limit simple daily living activities such as squatting, walking down stairs, and driving which can reduce a person's occupational and physical activity (Balachandar and Hampton, 2019). This leads to decrease in their performance in sports (Shamus and Shamus, 2015). Running may give rise to knee, ankle, and foot injuries and it affects up to 83 % of amateur or competitive runners (de Araujo and Baeza, 2015). In this study, we tend to focus on ITBS in female amateur runners. Amateur runners are people who are non-professional runners or those who are insufficiently skillful. Iliotibial band friction syndrome is the most common running injury in the lateral side of the knee (Barnier and Isabelle, 2019). Although the pathophysiological mechanism is well-defined, etiologies are poorly documented and management is uncertain (Barnier and Isabelle, 2019).

The aetiology of iliotibial band syndrome is multifactorial which involves both intrinsic and extrinsic factors (van der Worp and van der Horst, 2012). The modifiable causes of iliotibial band syndrome are Uphill running, running on a tilted surface, training error, and running in one direction. The anatomical factors are internal tibial torsion, hip abductor weakness, excessive foot pronation, increased medial weight bearing on the knee and genu varum. These factors can increase the tension of the ITB and lead to iliotibial bandsyndrome (Nurfadhilah and Yudhistira, 2023). Anatomical and physiological variations between males and females can be considered as a risk factor for lower limb pathologies. Many studies have been published to determine the extent to which females are more prone to certain injuries than males. According to some studies, a narrow femoral notch, higher body mass, more laxity and increased Q-angle in females lead to higher lateral force on the patella which results in increased retropatellar pressure between the lateral facet of the patella and femoral condyle (Beynnon and Shultz, 2008; Hewett and Myer, 2005). This can cause a gradual degeneration of the joint cartilage in the patella and can lead to pain and discomfort on the lateral side of the knee (Hewett and Myer, 2005).

Also, a study carried out in the year 2011, "The effect of gluteus medius training on hip kinematics in a runner with iliotibial band syndrome" revealed the support for the theory that hip control in the frontal plane may also be a contributing factor in ITBS. Hence, clinicians are encouraged to monitor hip control as well as ITBS symptoms when they utilize the gluteus medius protocol (Schreiber and Louw, 2011).

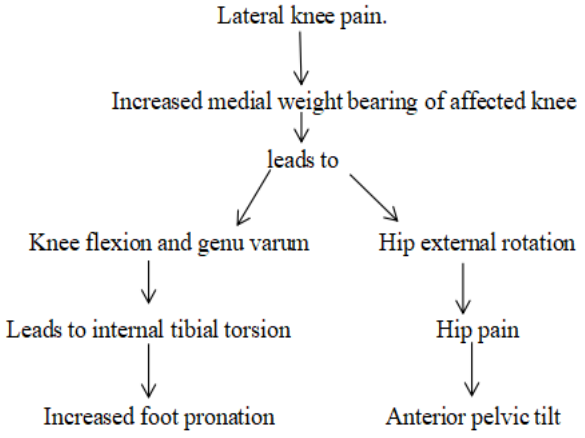
Individuals with Iliotibial band syndrome typically complain of a sharp or burning pain over the lateral joint line of the affected knee. In some cases, pain may radiate proximally or distally (Beals and Flanigan, 2013). Pain will increase with activity and in less severe cases, pain may subside upon cessation of activity. Some patients will experience a popping sound on the lateral side of the knee during activities (Beals and Flanigan, 2013). Some biomechanical researches have been conducted to know about the aetiology. Iliotibial band has both femoral and tibial attachments so it is possible that atypical hip and foot mechanics can lead to ITBS (Ferber and Noehren, 2010).

IT band friction syndrome

This flow chart depicts effect of IT band on posture. According to this, postural correction is important in IT band syndrome but most of the articles have focused on IT band stretching and abductor strengthening, and Postural correction part is neglected. Postural correction exercises and maintenance are needed for early recovery and for prevention of re-occurrence.

ITBS is diagnosed on the basis of history and physical examination. It is a clinically diagnosed and additional diagnostic studies are

not required (Beals and Flanigan, 2013). It was first diagnosed by Colson and Armour andlater by Renne (van der Worp and van der Horst, 2012). Ober's test is often used to assessIT band tightness (Corey Beals and David Flanigan, 2013). Pain assessment with the VAS, posture examination, and palpation to assess the tenderness, these techniques are used to assess the IT band syndrome (Graph 1)



Graph 1. IT band friction syndrome

In ITBS both conservative and surgical treatment options are viable.But the majority of cases are relieved with conservative management and the cases that needsurgical treatment are chronic in nature (Beals and Flanigan, 2013). This studyaims to see the effect of proximal to distal posture correction on ITBS to gain insight about the treatment ofiliotibial band syndrome in female amateur runners, in order to promoteevidence based management of ITBS.

MATERIALS AND METHODS

This comparative study has been carried out in Karad and Satara after receiving approval from the Institutional Ethical Committee. Female Amateur runners of age 18 to 30 years with normal BMI were included in the study. Other knee pathologies, Runners with orthopedic conditions, neurological condition, Surgery or trauma of lower limb in last 6 months, Overweight and underweight females were excluded.Total 168 subjects fulfilled the inclusion criteria, out of which 7 subjects did not agree to participate while other 11 terminated the treatment.Theremaining 150 individuals participated actively in the study. Then, the 150 participants were randomly allocated in two groups, namely Group A and Group B by simple random sampling.

Procedure

Participants were selected on the basis of inclusion and exclusion criteria. All the patients were explained about the study procedure intervention and the benefits of the current research work along with written consent and verbal informed consent that were taken from all the patients before including in this study. The approval of the Institutional Ethics Committee of Kırishna Institute of medical sciences "Deemed to be University Karadwas obtained for the study and helsinki declaration was complied with.

Demographic data of the patients including the name, age, gender and any history of systemic disease and medications were precisely documented before initiating the study. Assessment of the patients was done with the help of an Orthopaedician and also included pain assessment with visual analog scale, postural assessment as well as tenderness by palpation method and Ober's test.

According to the assessment, diagnosis wasconfirmed and treatment was given. The postural correction protocol was given for 4 weeks and after 4 weeks, advise on maintenance and prevention of re-injury was given. Statistical analysis and data collection was done.

Problem list

- Lateral Knee pain
- Anterior pelvic tilt
- Hip external rotation
- Hip pain (at greater trochanter of femur)
- Increased medial weight bearing of knee
- Slight knee flexion
- Weak hip abductors
- Excessive genu varum
- Internal tibial torsion
- Pronation of foot

Exercise Protocol

Following exercise program (Table 1) was given for a span of 4 weeks to the participants (Bhore and Shinde, 2023; McKay and Maffulli, 2020; Beers and Ryan, 2008; Fredericson and Wolf, 2005, Friede and Innerhofer, 2021).

After 4 weeks

Maintenance and prevent re- injury

- Warm-up - 15 min and cool down 10 min
- Stretching -10 minutes
- Use high medial wedge
- Change the direction of running to reduce load

Table 1. Exercise protocol

Duration	Exercises	Repetitions	Sets
	Cryotherapy x 15 mins		
	IT band stretch	15-30 seconds hold	3 sets
	Quadriceps stretch	15-30 seconds hold	3 sets
Week 1	Lunges	15-30 seconds hold	3 sets
	Hamstring stretch	15-30 seconds hold	3 sets
	Seated floor stretch Hamstring stretch	15-30 seconds hold	3 sets
	Calf Stretch	15-30 seconds hold	3 sets
	SLR	10 repetitions	1 set
	It band stretch, hamstrings stretch & quadriceps stretch	30 -40 sec hold	3 sets
	SLR + weights	10 reps	3 sets
	Abductors stretch	20-30 seconds hold	3 sets
	Prone extension hangs	10 repetition	3 set
Week 2	Knee extension with resistance band in seating	15 repetition	3 sets
	Single leg standing	10 sec hold and 10 repetition	
	Squats	10 repetition	3 sets
	Kneeling leg lift	10 sec hold , 10 repetitions	3 sets
	Clamshell exercise	10 sec hold , 10 repetitions	3 sets
	Seated calf muscle stretch	20-30 sec hold	5 sets
	IT band stretch	20-30 sec hold	5 sets
	Quadriceps stretch	20-30 sec hold	5 sets
	Abductor stretch	20-30 sec hold	5 sets
	Single leg standing	20-30 sec hold	5 sets
Week 3	Single leg squats	15 repetitions	5 sets
	Crunches	15 repetitions	3 sets
	Trunk rotation	15 repetitions	3 sets
	Bridging	15 repetitions	3 sets
	Planks	15 repetitions	3 sets
	IT band stretch	20-30 sec hold	5 sets
	Calf muscle stretch	-20-30 sec hold	5 sets
	Core strengthening	15 repetitions	5 sets
	Abductors strengthening	15 repetitions	5 sets
	Trunk rotation	15 repetitions and	5 sets
Week 4	Rolling of feet -	10 sec hold , 10 repetitions	2 sets
	Ball exercise of foot	5 repetition	5 sets
	Start running with medial wedge shoes		
	Line walking		
	Toe walking , Small quick steps on the spot -20 repetitions and 3 sets		

Group 2: ***Conventional physiotherapy***

- Rest
- Ice
- Stretching of IT band and Tensor Fascia Latae (TFL)
- Strengthening of adductors

Statistical analysis:

The data was collected and statistically analyzed. Assessment of pain and tenderness was done by using paired t-test. The postural examination in anterior, posterior and lateral view was analyzed by Chi-square test. Ober's test were analyzed by percentage. Statistical significance was accepted if the p values is $p < 0.05$.

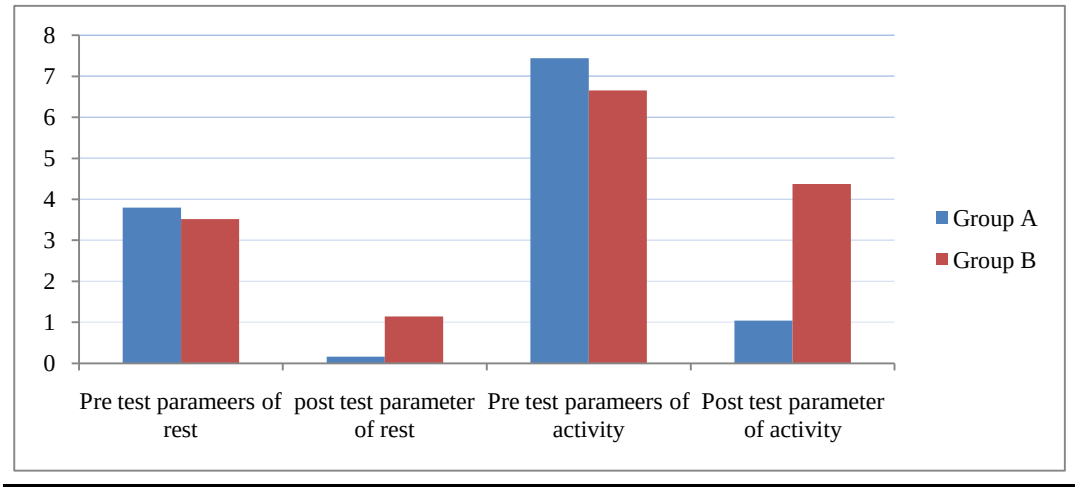
RESULTS

This study was carried out among 150 female amateur runners with IT band friction syndrome. According to statistical analysis the effect of posture correction exercise program was significantly effective for IT band friction syndrome in female amateur runners as compared to conventional exercise program. There was a significant reduction in pain ($p<0.0001$) in Group A than the group B. Postural abnormalities in IT band friction syndrome were also significantly ($p<0.0001$) resolved and the Ober's test came as 76% negative out of 100% positive patients.

Table 2. Pain assessment

VAS at rest							
Group	**Pre-test**		**Post -test**		**Paired t test**	**P value**	**Result**
	Mean	**SD**	**Mean**	**SD**			
Group A	3.800	1.685	0.1600	0.628	19.140	<0.0001	Extremely significant
Group B	3.520	0.963	1.146	1.322	14.458	<0.0001	Extremely significant
VAS on activity							
Group A	7.440	1.222	1.040	1.976	28.297	<0.0001	Extremely significant
Group B	6.653	1.133	4.347	2.474	9.460	<0.0001	Extremely significant

Graph 2. Pain assessment



Interpretation

The above table and graph interpret that intensity of the pain of group A was decreased as comparedto group B. The Group A had a mean at rest which was 3.800±1.685on pre test and was reduced to 0.1600±1.628 post test while group B had a mean of 3.520±0.963 on pre test which was reduced to 1.146±1.322 post test. The mean of group A on activitywas 7.440±1.222 decreased to 1.040±1.976 on post test while the group B had a mean of 6.653±1.133 on pre test which was reduced to 4.347±2.474 post test. The paired t-test showed a value of 19.140 and a p-value <0.0001 which was extremely significant at rest. On activity, the p-value was <0.0001 and paired t test value was 28.297 for group A while for group B it was 14.458 on rest and on activity it was 9.460. P value for group B was <0.0001 on activity and at rest as well (Table 2).

Table 3. Postural assessment of anterior view

Anterior view					
Group		**Pre test**	**Post test**	**P value**	**Result**
Group A	**Normal knee**	1	61	<0.0001	Significant
	Knee varus	74	14		
	Normal tibia	34	68	<0.0001	Significant
	Internal tibial torsion	41	7		
Group B	**Normal knee**	5	19	0.0038	Significant
	Knee varus	70	56		
	Normal tibia	26	36	0.1356	Not Significant
	Internal tibial torsion	49	39		

Interpretation

Table 3. Chi- test was used to obtained the results for postural assessment for anterior, lateral and posterior view. This table shows that the knee and tibial abnormalities are decreased in post test in group A. For group A, p value was <0.0001 which was significant, but for group B it was 0.1356 for tibia which was not significant and for knee,0.0038 which was significant.

Table 4. Postural Assessment inlateral view

Lateral view					
Group		**Pre test**	**Post test**	**P value**	**Result**
Group A	**Normal knee**	1	61	<0.0001	Significant
	Knee varus	74	14		
	Normal pelvis	26	73	<0.0001	Significant
	Anterior pelvic tilt	49	2		
	Normal foot	6	60	<0.0001	Significant
	Foot pronation	69	15		
Group B	**Normal knee**	5	19	0.0038	Significant
	Knee varus	70	56		
	Normal pelvis	10	20	0.0662	Not Significant
	Anterior pelvic tilt	65	55		
	Normal foot	7	16	0.0698	Not Significant
	Foot pronation	68	59		

Interpretation

Table 4. This table depicts of postural assessment in lateral view, in which group A showed significant results for knee, foot and pelvis. The p value of group A was <0.0001. The group B was having P value of 0.0038 for knee which was significant, p value for foot and pelvis was 0.0698 and 0.0662 which was not significant.

Table 5: Postural Assessment in posterior view

Posterior view					
Group		**Pre test**	**Post test**	**P value**	**Result**
Group A	**Normal knee**	1	61	<0.0001	Significant
	Knee varus	74	14		
	Normal pelvis	26	73	<0.0001	Significant
	Anterior pelvic tilt	49	2		
Group B	**Normal knee**	5	19	0.0038	Significant
	Knee varus	70	56		
	Normal pelvis	10	20	0.0662	Not Significant
	Anterior pelvic tilt	65	55		

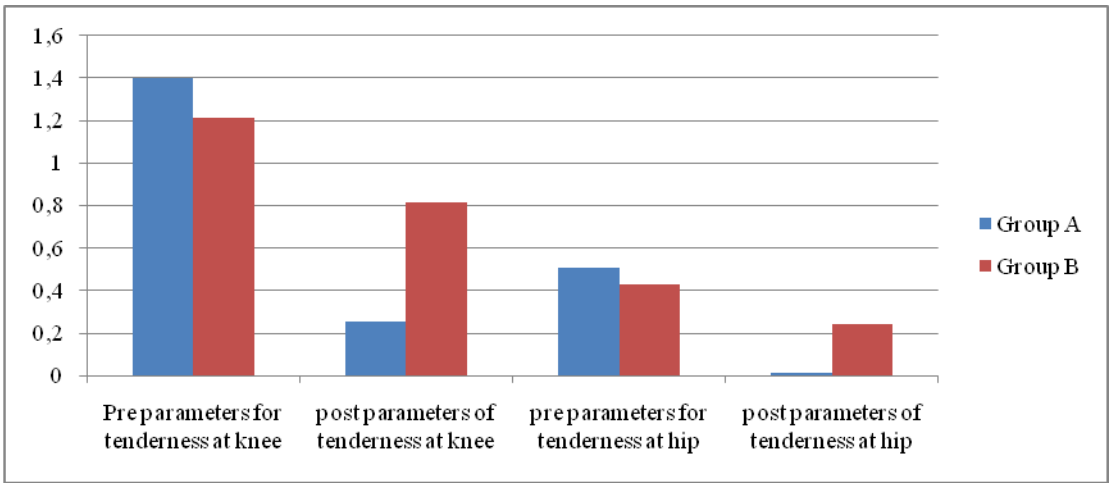
Interpretation

Table 5. This table interpreted that in the group A abnormality of knee and pelvis was decreased in post test assessment which was significant. In the group B, result was not significant for pelvis as the p value was 0.0662 and knee it was significant0.0038

Table 6. Assessment of tenderness

Group	Pre-test		Post –test		Paired t test	P value	Result
	Mean	SD	Mean	SD			
Tenderness at knee							
Group A	1.400	0.545	0.253	0.5220	15.758	<0.0001	significant
Group B	1.213	0.4124	0.8133	0.3923	6.083	<0.0001	Significant
Tenderness at hip							
Group A	0.506	0.665	0.013	0.115	6.257	<0.0001	significant
Group B	0.426	0.497	0.24	0.4300	4.121	<0.0001	Significant

Graph 3. Assessment of tenderness.



Interpretation

Table 6 and graph 3: This table and graph interpret that grade of tenderness of group A was decreased as compared with group B. The Group A had a mean of tenderness at knee which was 1.400±0.545 on pre test and was reduced to 0.253±0.5220 post test while group B had a mean of tenderness at knee was 1.213±0.497 on pre test which was reduced to 0.8133±0..3923 post test. The mean of group A at hip was 0.506±0.665 then it was decreased to 0.013±0.115 on post test while the while group B had a mean of 0.426±0.497onpre test which was reduced to 0.24±0.4300post test.

The paired t-test has a value of 15.758 and a p-value <0.0001 which was significant for tenderness at knee. At hip, the p-value was <0.0001 and paired t test value was 6.257 for group A while for group B it was 4.121at hip and at knee it was 6.083. P value for group B was <0.0001 at knee and at hip for tenderness.

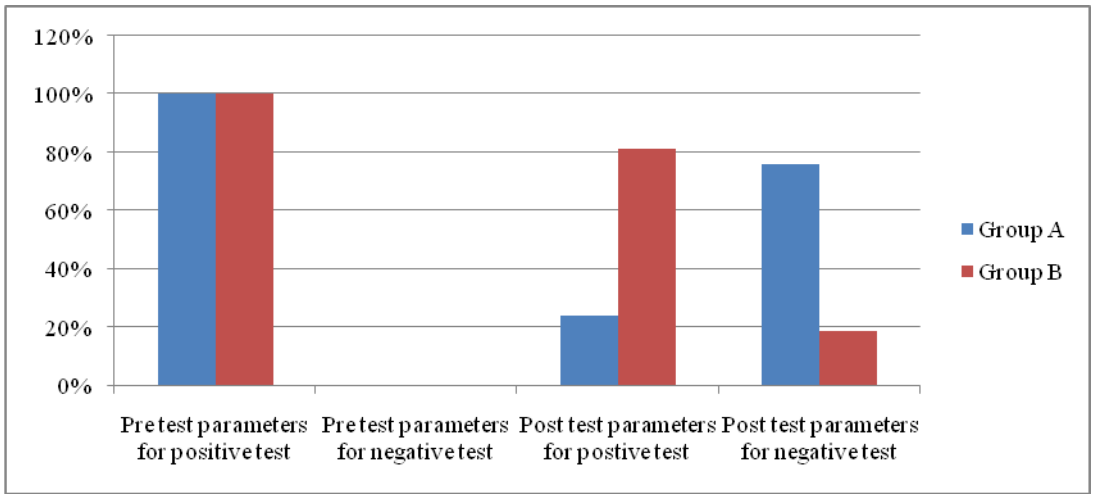
Interpretation

This table 7 and graph 4 interpret that the Ober's test was positive in 150 participants on pre test assessment. On post test assessment 76% participants were negative and 24% were positive in group A out of 100%. In group B, 18.7% were negative and 81.3% participants were positive on post test out of 100%.

Table 7. Ober's test.

Group	Pre test		Post test	
	Positive test	Negative test	Positive test	Negative test
Group A	100%	0	24%	76%
Group B	100%	0	81.3%	18.7%

Graph 4:Ober's test



DISCUSSION

The aim of this research was to study and find the effect of the proximal to distal postural exercise program for IT band syndrome in female amateur runners. According to inclusion and exclusion criteria, 168 femaleswere found with IT band friction syndrome. Out of which 7 female refused to take part in this study and 11 females terminated the treatment. Then the study was carried out with 150 females who wererandomly divided into 2 groups by simple random sampling. Then pre assessment of pain threshold, postural assessment, tenderness and Ober's test were taken. Group A included 75 participates who underwent proximal to distal postural exercise program for IT band syndrome for 4 weeks and group B followed a conventional exercise program for IT band syndrome. Then a comparison between the effectiveness of the two groups was made.

By taking all the results into consideration, we can say that the proximal to distal posture correction protocol for IT band syndrome in female amateur runners is effective. Group A subjects showed better improvement in pain threshold, muscle length, severity, and walking distance as compared to group B.

A systematic review of literature on the aetiology, diagnosis and treatment of iliotibial band syndrome inrunners was carried out in 2012 in which, adult runners below 18 years were included. This study revealed that, as the participation in this sport was increased, incidence of running related injuries also increased (van der Worp and van der Hors, 2012).

Reed Ferber et al undertook a research study with the purpose of finding out difference in running mechanics between runners who had history of ITBS and runners with no knee related running injuries. This study revealed that it is possible that atypical hip and foot mechanics could be a reason in the development of iliotibial band syndrome because ilotibial band is attached to femur and tibia. This study included 35 females with previous history of ITBS and 35 healthy females with no history of running injuries of knee. Internal movement during the stance phase of running gait was measured and comparison of hip, knee and ankle in 3 dimensional kinematics were done. The results suggested that correction of atypical lower limb kinematics may decrease IT band stress and it should be considered in the treatment of iliotibial band syndrome (Ferber and Noehren, 2010).

It is seen that due to its role in stabilizing the knee joint and with repeated flexion-extension movements of the knee, the tightness on the Iliotibial Band (ITB) increases. The tightness that occurs in the ITB, which is connected to the knee and hip joints, has also been seen to have a critical importance in the performance of the athlete and in athlete injuries. A study was carried out to investigate the relationship between Ober inclination angle (OIA), pressure pain threshold (PPT) and hip abductor muscle strength in athletes with ITB tightness which included 45 participants between 18-25 years of age. This study concluded that OIA was correlated with PPT and hip abductor muscle strength in athletes with ITB

tightness. As the OIA decreased, the hip abduction strength and
the PPT level decreased (Ünivar and Demirel, 2022).

Similarly, a study named “Effectiveness of a Conditioning Program onAmateur Female Marathon Runners” wherein 52 amateur female marathon runners, pain andexertion using pain assessment and Borg Scale was evaluated. Occurrence of incontinence wasassessed by asking a simple ‘yes’ or ‘no’ question and Delayed onset muscle soreness (DOMS) was assessed using pain pressure threshold (PPT) 24 hours post run. Then these females were administered a structured conditioning exercise program which was proven to be effective in reducing their risk of injuries and problems related to women’s healththat occur while running a marathon (Kolhatkar and Shinde, 2020)

A study carried out in the year 2021, named “Effect of lower limb proximal to distal muscle imbalance correction on functional pes planusdeformity in young adults” which included 40 participants with functional pes planus deformity and were divided into 2 groups, that received the baseline treatment for the muscle imbalance along with the intrinsic muscle strengthening exercises (experimental group) or agroup that received only intrinsic muscle strengthening exercises (control group) for a span of 6 weeks. This study further concluded that muscular imbalance corrective exercises and intrinsic muscle strengthening exercises are to be recommended to correct the deformity as well as to prevent the abnormalities in people with functional pes planus. (Sawant Janhavi and Sandeep, 2021)

Barnier et al conducted a study with an aim to find that the use of postural insoles may play a role in the recovery in runners with ITBS assuming that plantar inefficiency may promote postural and kinetic control disorder underlying ITBS. They used visual analogue scale to assess the pain, Nobel and Runner test, posture assessment as outcome measures. This study stated that use of postural insoles have therapeutic benefits in symptomatic improvement of runners with ITBS (Barnier and Isabelle, 2019).

Also , a recent study carried out in atheletes , which was about comparison of anxiety in athletes doing sports on different surfaces. The surfaces compared in this study included parquet floor, turf surface and artificial turf surface.The "Sport Injury Anxiety Scale" was used in order to determine the sports injury anxiety levels of the participants. The scale was implemented online through Google Forms.It was observed that athletes doing sports on parquet floor had higher levels of sports injury anxiety compared to those doing sports on turf and artificial turf surface. Considering that athletes who do sports on parquet floor had high levels of sports injury anxiety, it is important that these athletes should be supported in terms of coping with anxiety (Gerçek et al, 2023) Similarly, in our study the female amateur runners are prone to run on uneven as well as even surfaces. So, it is equally important for these females to also check their anxiety during performing the running activity and thereby subsequent anxiety coping strategies can be incorporated.

A study done by V. Balachandra et al regarding determining the lower limb biomechanics and conservative intervention in ITBS including the adults within the age between 18 to 50 years with ITBS., concluded that the greater hip adduction , greater knee internal rotation and greater femoral external rotation are the risk factors for ITBS. In the treatment of ITBS they used NSAID’s, ITB stretching, hip abductors strengthening which reduced the pain and prevented recurrence for up to 6 months (Balachandar et al., 2010).

On the other hand, the negligence of the iliotibial band syndrome sometimes canresult into patellofemoral pain syndrome. Patients might feel pain around and under the patella in addition to the knee and hip pain. ITBS is treatable with appropriate breaks from sports but not to give up on them and also with the help of proper treatment. Once the pain is reduced, then slow and progressive return to the regular activities is possible (Francis et al., 2019).

The prevention of Iliotibial band syndrome might be difficult if the individual is a long-distance runner but can decrease the risk by doing some techniques like: Avoid running up hill or down a hill, slow warm up and slowcool down, wearing supportive shoes which is important, avoid running on tilted surface, shift training intensity gradually, slowly speed up andavoid running in one direction for long time.

The future scope in terms of research on management of ITBS in runners should pay more attention on concealing treatment.The treatment

should include advice on coordination and style of running, choice of shoes and running surface, strengthening of hip musculature. Also, along with conservative intervention targeting bio-mechanical factors associated with ITBS are required to treat ITBS and prevent its recurrence

Conclusion

On the basis of results it can be concluded that the group A who followed proximal to distal postural exercise program showed better improvement in posture and pain intensity as compared to group B. Hence, we can conclude that proximal to distal posture exercise program is significantly effective in the treatment of IT band syndrome in female amateur runners. Similarly utilizing a multifaceted patient centered approach has been proven to be quite effective and lead to successful return to running activity.

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Conflict of interest

The authors declare no conflict of interest. No financial support was received.

Ethics Statement

The approval of the Instıtutional Ethics Committee of Kırıshna Instıtute of medical sciences "Deemed to be University Karadwas obtained for the study (Protocol number 138/2021-2022).

Author Contributions

Study Design, SBS and RB; Data Collection, NK; Statistical Analysis, SBS; Data Interpretation, RB and NK; Manuscript Preparation, SBS and RB; Literature Search, SBS, and NK. All authors have read and agreed to the published version of the manuscript.

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