

Risk factors and impairments in iliotibial band friction syndrome among basketball players

ABSTRACT

Background: Iliotibial band friction syndrome (ITBFS) is commonly seen in sport players overloading knee joint in adolescents as knee is engaged in almost all sports activities. Basketball involves activities such as running and jumping where there are repetitive knee flexion and extension, iliotibial band repetitively shifts forward and backward which causes friction and inflammation of the iliotibial band.

Aim and Objectives: The aim of this study is to study risk factors and impairment in ITBFS among basketball players.

Methodology: Out of 60, 12 basketball players were medically diagnosed with ITBFS within age group of 12–23 years, including both males and females who practiced at least 30 min a day without any recent surgery or fracture of lower limb. The consent form was taken, and the procedure was explained. Each player was subjected to therapist administered questionnaire with details of risk factors namely; age, gender, body mass index, hours and years of practice, training sessions followed by special test for knee related to iliotibial band syndrome. The lower extremity functional scale (LEFS) was filled to assess the level of difficulty in activities due to knee pain.

Results: In this study, ITBFS in basketball players was 16.66% with LEFS score of mean 62 indicating mild to moderate disability.

Conclusion: Training errors such as irregular stretching, warm up and cool down, change in intensity of training, running on concrete surface are some of the risk factors of ITBFS. Mild to moderate disability was found on LEFS due to ITBFS.

Keywords: Basketball players, iliotibial band friction syndrome, lower extremity functional scale, noble compression test, obers test

عوامل الخطر والإعاقات في متلازمة احتكاك عصبي البلغم بين لاعبي كرة السلة
خلفية البحث: عادة ما تلاحظ متلازمة احتكاك عصابة Iliotibial (ITBFS) في اللاعبين الرياضيين الذين يفرطون في استعمال مفصل الركبة لدى المراهقين حيث تشارك الركبة في جميع الأنشطة الرياضية تقريباً. وتتضمن كرة السلة حركات مثل الجري والقفز حيث يصاحبها ثنيا ومدا متكررا للركبة، حيث يتغير بالإضافة الى الحراك للأمام والخلف مما يسبب الاحتكاك والالتهاب في عصابة (ITBFS) Iliotibial
الهدف والأهداف: الهدف من هذه الدراسة هو دراسة عوامل الخطر وضعف في ITBFS بين لاعبي كرة السلة.
منهجية الدراسة: من أصل 60، تم تشخيص 12 من لاعبي كرة السلة طبيياً مع ITBFS في المجموعة العمرية 12-23 سنة، بما في ذلك الذكور والإناث الذين مارسوا 30 دقيقة على الأقل في اليوم دون إجراء أي عملية جراحية حديثة أو كسر في الأطراف السفلية. تم أخذ استمارة الموافقة، وتم توضيح الإجراء. واضح لكل لاعب محتويات الاستبيان مع تفاصيل عوامل الخطر وهي: العمر والجنس ومؤشر كتلة الجسم وساعات وسنوات ممارسة الرياضة، وجلسات التدريب تليها اختبار خاص للركبة المتعلقة بمتلازمة الفرقة Iliotibial. وتم ملء المقياس الوظيفي الأدنى (LEFS)

لتقييم مستوى الصعوبة في الأنشطة بسبب ألم الركبة.
النتائج: في هذه الدراسة، كان انتشار ITBFS بين لاعبي كرة السلة 16.66٪ مع درجة LEFS من المتوسط 62 مما يشير إلى إعاقة خفيفة إلى معتدلة.
الخلاصة: أخطاء التدريب مثل التمدد غير المنتظم، الاحماء و التهدئة، تغير شدة التدريب الجري على سطح خرساني هي بعض عوامل اخطار ITBFS. وتم العثور على إعاقة خفيفة إلى معتدلة على LEFS بسبب ITBFS.

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INTRODUCTION

Iliotibial band friction syndrome (ITBFS) is an overuse injury not only affects the runners but has also proved that it can lead to reduced performance in other athletes such as cyclist, soccer player's, field hockey players, basketball players, rower's, long distance runners, volleyball players, and weight lifters.^[1-3] ITBFS is commonly accepted as most common running injury of lateral side of knee, with 1.6%–12% of incidence.^[3] As high as 22.2% of the incidence of ITBFS has been documented in lower extremity injuries in runners.^[4] Tenforde found prevalence of ITBFS in (girls 7%) boys (5%).^[5]

Basketball is a game which includes activities such as running and jumping, and it also includes few special movements related to the way the game is played (e.g., basketball shots) and combined movements (e.g., dribbling on the run).^[6,7] This kind of overload syndromes are caused by microtrauma at the area due to repetitive activities, and knee joint is the joint which is most frequently affected in adolescents age group because knee joint is involved in almost all sports activities. Basketball is a contact sport which requires high physical activity and as the player spends majority of time on one of the limb this causes fatigue, and due to sudden running and stopping activities, they go off balance which increases chances of injury.^[8]

During movement of knee, in which there is repetitive knee flexion (such as running), the iliotibial band repetitively shifts forward and backward on the lateral femoral epicondyle, and this causes friction at the lateral femoral epicondyle and thus causes the inflammation of the iliotibial band.^[3]

The first complaint in patients with iliotibial band syndrome is diffuse pain which is experienced at the lateral aspect of the knee joint. As the time passes and the activity increases the initial pain on the lateral side of knee becomes more sharp painful and localized pain and they may experience discomfort over lateral femoral epicondyle. Patient may also experience pain which aggravates or increases while running down hills and as the stride increases in length.^[9]

Some causes of ITBFS can be preexisting tightness of iliotibial band, high mileage weekly, and duration of running on track.^[4] Training errors which may include a fast change in exercise routine.^[10,11] An intervention was done which shows that improving warm up and cool down techniques can be a first step which may therefore reduce the occurrence of running injuries.^[12] Type of running surface like on surfaces with excessive arch increases tension in lateral components in the knee and is associated with ITBFS. The injury is also

associated with excessive training on surfaces such as concrete having poor ability to absorb shock.^[11,13]

As compared to unaffected leg, weak hip abductors strength is found in affected leg in ITBFS.^[14] Warm up and stretching increase the elasticity of muscle their contractions become smoother and therefore prevent muscle injuries. If the warm up and cool down techniques are improper, they are also risk factors for lower extremity musculoskeletal overuse injuries in sports.^[12,15]

METHODOLOGY

The institutes with basketball players were approached. Ethical approval was obtained. Informed consent was taken, and the procedure, aim, and objectives of study were explained. A survey-based study was conducted, in which included 60 basketball players which were randomly selected among which 12 were medically diagnosed with ITBFS with age group of 12–23 years, including both males and females basketball players who practiced for 30 min in a day without any recent surgery or fracture of lower limb. Players were subjected to a thorough history including history of age, gender, body mass index, a validation of scale among experts in institute was done for assessing risk factors, namely, previous injuries, hours and years of practise, training history and then they were checked with various special test for knee including varus stress test for assessing lateral collateral ligament injury,^[16] obers test for iliotibial band tightness which has good interrater reliability,^[16,17] noble compression test for ITBFS which has moderate and acceptable interrater reliability^[16-18] and Apleys test accuracy - 80.3% for lateral meniscal injury.^[16,19] They were also asked to fill the lower extremity functional scale (LEFS) to assess the level of difficulty in the activity due to knee pain which has excellent test – retest reliability ($r = 0.94$).^[20]

RESULTS

Nearly 16.66% of basketball players were positive for ITBFS. Among the sample, 10 players were positive for noble compression test, out of which eight players were positive for obers test. They had mild to moderate disability which was interpreted using LEFS. Training errors such as irregular stretching, warm up and cool down, change in intensity of training and running, running on concrete surface are some of the risk factors of ITBFS which was found among these players.

DISCUSSION

In this study, there were 60 basketball players with 25 males and 35 females. There were about (23) 38.33% of players

in 12–14 age group, (27) 45% players in 15–17 age, (7) 11.67% in 18–20 age group, and (3) 5% in 21–23 age group. The mean age of basketball players was 15.9667.

After this evaluation, results show that the prevalence of ITBFS in basketball players is 16.66%. Among 60 basketball players, 12 players reported pain over lateral side of knee. On investigation with thorough history and examination, among 12 players, 10 players were positive for noble compression test, and medically diagnosed which indicates ITBFS. Out of which, 8 players were positive for obers test which indicates iliotibial band tightness. One player was positive for varus stress test which indicates lateral collateral ligament injury and one player was positive for Apleys test indicating lateral meniscus injury. Among players positive for ITBFS, the mean of LEFS was about 62 which indicate mild to moderate disability. In this study, the prevalence of ITBFS is 16.66% in basketball players with mild to moderate disability according to the results of LEFS.

We also found that players with ITBFS had difficulty in squatting while running on uneven road, climbing stairs up and down and while hopping as such activities cause repetitive knee flexion and extension. Training errors were found like irregular stretching, warm up, and cool down techniques which were practiced by these basketball payers. Such irregular and improper training contribute to the ITBFS and other lower extremity injuries. If these techniques are properly and regularly done, it may prove to reduce the risk of injury.^[12]

In previous studies, it was found that the incidence of ITBFS in athlete was about in range in 1.6%–22.2%.^[3,4] About 33% patients with ITBFS with varus knee alignment were found and also that there was more incidence of ITBFS than that of the previous studies, it was found that (in 1981 4.3%, in 1991 7.5% and in 2000 8.4%). In this study, there were more women than men, and he found about (62%/32%) of the prevalence of ITBFS more in women, and ITBFS was one of the five most common injuries.^[13]

Changes in footwear construction can be said as a cause of ITBFS, and they also found that ITBFS is commonly seen in women than in men.^[13,21] Change in intensity of training and running was practiced by the basketball players. These players used to run over the basketball court made up of concrete which has poor ability to absorb shock and may contribute to ITBFS, while in a study, they also found that running on surfaces such as which are very soft like running on sand is also associated with the cause of ITBFS.^[11,13]

According to a theory proposed they found that excessive internal rotation of tibia which is caused due to excessive eversion of rare foot plays an important role in the development of ITBFS. This causes excessive strain in the iliotibial band as it is attached to the Gerdy's tubercle.^[22,23] Increase in hip adduction due to hip abductors weakness can be a cause for ITBFS as it causes knee internal rotation and increases strain in the iliotibial band.^[23] It was also found that in case of 196 running injuries ITBFS ranked third most common injury of about (12%).^[4,24]

It was found that there was no hip abductor muscle weakness in other athletes such as track athletes suffering from ITBFS, therefore, hip abductor weakness does not appear as a cause of ITBFS.^[22,25]

Training errors are most common cause of overuse running injuries. If the training routine is properly progressed, it allows the supporting structures of the pelvis and knee to get adapt to increased stresses over them. If increasing the intensity, duration and frequency of the training runs inappropriately and too soon incorporating hills on the training routes, may overload the supporting structures of the knee and eventually cause to injury.^[26-28]

Future scope of study

- Studies can be done to find ITBFS in other athletes who play with repetitive knee flexion
- Study can be done with larger sample size
- Study can be done in different geographical areas
- Biomechanical analysis can be done with computerized posturography.

CONCLUSION

There is 16.66% of basketball players were medically diagnosed with ITBFS.

Mild to moderate disability of lower extremity is seen in basketball players with ITBFS.

Training errors such as irregular stretching, warm up and cool down, change in intensity of training and running, running on concrete surface are some of the risk factors of ITBFS which was found among these players.

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Conflicts of interest

There are no conflicts of interest.

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