

Research Article

Prevalence of Patellar Tendinopathy in Recreational Fast Bowlers

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A B S T R A C T

Background: Cricket is one of the most popular sports in India. It requires great teamwork from every player. A fast bowler has an important role in the team. The bowling of fast bowlers involves complex actions of the upper limbs, lower limbs, and trunk, due to which they are more prone to injuries. Patellar tendinopathy is a condition characterised by anterior knee pain localised to the inferior pole of the patella. Fast bowling requires a bounce or jump in bowling action which enables the bowler to switch from the run-up phase to the position of back-foot contact. Repetitive high bounce can lead to increasing loading activity and hence can cause damage to the patellar tendon, thereby affecting the performance of the bowler. Therefore, it is necessary to rule out the prevalence of patellar tendinopathy in recreational fast bowlers.

Methodology: The study group consisted of 92 male recreational fast bowlers belonging to the age group of 15-30 years. The VISA-P questionnaire was employed as a measurement instrument for the intensity of pain. The questionnaire was given to each subject. They were further assessed based on their score.

Results: The statistical research revealed a highly significant correlation between patellar tendinopathy and recreational fast bowling with p value < 0.0001. A significant relationship between age and patellar tendon pain was also found.

Conclusion: The research revealed that patellar tendinopathy has a considerable prevalence among recreational fast bowlers.

Keywords: Recreational Fast Bowlers, Anterior Knee Pain, Tendinopathy

Introduction

Cricket is the most played sport in India. Fast bowlers are crucial team players who occasionally stand alone and bring their side to victory. They are the ones in a team who are most prone to injuries.¹ When bowling quickly, bowlers

make complicated movements with their upper bodies, lower bodies and trunk in an effort to create the fastest possible ball velocity.²

Run up → Pre-delivery stride → Mid-bounce → Back-foot contact → Front-foot contact → Ball release → Follow

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through: these are the sections of fast bowling. Fast bowlers endure vertical ground response forces of up to three times their body weight at rear foot contact during the last delivery step.³

Pain at the inferior pole of the patella and anterior knee discomfort are the defining features of patellar tendinopathy. Muscle loading and increased demand on knee extensor muscles, notably activities that both store and release energy can aggravate the pain.⁴ It is a common condition among young athletes, most often males of the age group of 15-30 years.⁵

A bowler can move from the run-up phase to the back-foot contact position by bounding or bouncing. Little transition is required in the case of chest-on bowlers, as many of them have short and narrow bounds. Contrarily, side-on bowlers must rotate their bodies through 90°, therefore their bound tends to be longer and they have a higher bounce. A high bounce may cause the rear leg's knee to collapse, losing momentum. An increase in the loading activity of the knee extensor musculature can lead to pathological changes at the patellar tendon which further may lead to pain at the lower pole of the patella. During the phase of front-foot contact, the knee joint goes into full extension. If the knee joint goes into hyperextension, it may increase the chances of patellar tendinopathy.

The main diagnostic manoeuvre for patellar tendinopathy is pain on palpation. Tenderness is present when evaluating patients with this condition. The clinical manifestations are localised pain to the inferior angle of patella, an increase in pain with loading of knee extensor muscles, and pain when using the patellar tendon to store and release energy. Additional symptoms and indicators could include discomfort when standing or sitting for an extended period of time. The pain in the patellar tendon increases during muscular loading and almost always subsides when the load is released.

The Victorian Institute of Sports Assessment- Patella (VISA-P) is a standardised questionnaire for the condition's pain and function outcome measure.⁶ It is a 100 points scale, in which a high score represents better function and less pain.⁷ The questionnaire consists of 8 questions, through which the severity of the pain can be evaluated for various activities after completing the sports activity. The severity of pain is graded from 0 to 10. A question which can evaluate the physical activity of the individual is also included in it. Evaluation of prevalence is done with the help of the VISA-P questionnaire.

Repeated jumping, hopping, and landings are the major risk factors for patellar tendinopathy in recreational fast bowlers. These actions lead to the loading of patellar tendon, which can cause damage to it. An increase in

loading activity can cause pain at the inferior angle of patella, which may lead to patellar tendinopathy. Bowlers experience pain at the knee; specifically at the inferior pole of patella. Sometimes the pain is to such an extent that the bowler is not able to perform any physical activity. Evaluation of symptoms of knee pain can help to rule out the tendinopathy of the patellar tendon.

Materials and Methodology

In this study, the incidence of patellar tendinopathy in recreational fast bowlers was determined. The study was conducted at Krishna College of Physiotherapy, Karad. This observational research was carried out for six months from May 2022 to October 2022. People were contacted, and those who met the requirements for inclusion were chosen. Each participant signed a consent form after being informed of the study's goals and its execution. 92 individuals were selected. The following formula was used to calculate the sample size for the study.

$$N = 4pq/l^2$$

where N: sample size,

p: prevalence (from previous studies) = 36,

q = 100-p = 64,

l: allowable error (10) = 100

Thus, N = 92

The inclusion criteria were recreational male fast bowlers in the age range of 15 to 30 years who played cricket at least thrice a week. The exclusion criteria were female gender, individuals with recent fractures, patellar tendon injuries, recent knee injuries, and professional fast bowlers.

Victorian Institute of Sports Assessment - Patella (VISA-P) questionnaire was used as a primary outcome measure. It was administered to the respondents to assess symptoms and their impact on physical activity. There were eight questions in the questionnaire divided into three categories: pain, functional status, and activity status. Questions 1-3 were related to pain. Questions 4-6 were related to function. Question 8 contained 3 sub-questions; individuals had to attempt only 1 of them. The first 7 questions were scored out of 10 and question 8 had a maximum score of 30. The maximum score was 100, which corresponds to a subject who is completely asymptomatic. The lowest score indicated the most symptoms and the greatest limitation of physical activity.

The purpose of the study was explained to the individuals. All the participants were well-educated and fluent in English. If they didn't understand any word or term in the questionnaire, it was explained to them. Each participant was given a questionnaire to complete, and their scores were calculated. For each individual, statistical analysis and

interpretation were performed to determine the prevalence of patellar tendinopathy in recreational fast bowlers.

Ethical Clearance

Ethical clearance was taken from the Institutional Ethics Committee of Krishna Institute of Medical Sciences, Deemed to be University, Karad.

Statistical Analysis

We used unpaired t-test for analysis. Instat software was used to perform statistical analysis on the recorded data.

Results

As shown in Table 1, there is a significant relationship between age and patellar tendon pain in recreational fast bowlers.

Table 1. Distribution of Participants as per their Age

Age Group (Years)	Pain		Unpaired t Test	p Value
	Mean	Standard Deviation		
15-20	95.44	2.9	4.59	< 0.0001
21-25	91.5	2.5	5.55	< 0.0001
26-30	96.1	3.2	6.07	< 0.0001

Table 2. Distribution of Participants as per their Pain Level

Score	Level of Pain at Patellar Tendon	Number of Players	Percentage of Respondents
100	None	44	48
90-99	Mild	31	33
80-89	Moderate	13	14
< 80	Severe	4	4

Table 3. Mean and Standard Deviation Values of Pain among the Participants

Total No. of Bowlers	Pain		One Sample t Test	p Value
	Mean	Standard deviation		
92	93.41	7.32	122.37	< 0.0001

As shown in Table 2, 48% of bowlers reported no discomfort following the match, 33% reported mild pain, 14% reported moderate pain, and 4% reported severe pain after the match.

As shown in Table 3, there is a significant association between recreational fast bowling and patellar tendon pain.

After analysing the data in this study, it was observed that there is a prevalence of patellar tendinopathy in recreational fast bowlers. There were 44 bowlers with no pain after the

game or they were asymptomatic. 31 bowlers had mild pain after the game, 13 had moderate pain, and 4 had severe pain after the game. The prevalence of patellar tendinopathy was 52% in this study. The relationship between pain and age was found to be significant.

Discussion

The goal of the study was to determine the prevalence of patellar tendinopathy in recreational fast bowlers. The objectives were to assess the severity of the pain and symptoms at patellar tendon in recreational fast bowlers, after a game, according to the VISA-P questionnaire. Many studies have been conducted on knee and tendon injuries in professional fast bowlers, however, very few studies have been conducted on the clinical severity of patellar tendinopathy in recreational fast bowlers.

Our study showed that 31% of fast bowlers had mild pain, 14% had moderate pain and 4% had severe pain. The observed results were statistically significant ($p \leq 0.0001$). Professional fast bowlers receive more advanced preparation for matches and as a result, their tendon adapts more quickly to such high-intensity training than recreational bowlers. A biomechanical analytic study by Thiagarajan et al. showed a significant difference between professional and recreational fast bowlers. Alteration in the biomechanics of fast bowlers can change the bowling line-up, thereby leading to an increased risk of injury.⁸ Excessive knee extension or alteration in the intensity of the bounce during the mid-bounce phase will increase the risk of patellar tendon pain in recreational fast bowlers.

According to a study by Lian et al., this condition has male predominance with a more common occurrence among adolescents and young adults.⁵ In our study, 92 individuals between the ages of 15 and 30 years were included. Among them, 35% of bowlers in the age group of 15-20 years showed a significant association between age and patellar tendinopathy ($p \leq 0.0001$). The probable reasons could be that in younger children, patellar tendon is attached to the growth plate of knee joint, and irritation and injury to the growth plate of children can occur because of repetitive loading activity or repetitive stress on the patellar tendon. Growth plate closure may delay up to 18 to 20 years of age.⁹

37% of bowlers in the age group of 21-25 years and 28% of bowlers in the age group of 26-30 years also showed significant associations ($p = 0.0001$). The probable reason could be many factors; both intrinsic and extrinsic variables may contribute, including muscle weakness or inflexibility as well as imbalances in strength, postural alignment, foot anatomy and ankle dorsiflexion.¹⁰

A study showed a 20% incidence of patellar tendinopathy in athletically active people.¹¹ According to another study, patellar tendon injuries are the most common among

football and basketball players with 95% of incidence rate.¹² Our study showed that the prevalence of patellar tendinopathy in recreational fast bowlers is 52% with statistical significance. The probable reasons for the prevalence could be many factors such as age, practising hours, lack of physical training, duration of warm-up and cool-down activities, and improper body mechanics during bowling. These factors play an important role in bowling. Proper training and bowling techniques may help to improve physical capacity, endurance, and body mechanics.

This study will be beneficial for recreational fast bowlers for evaluation of their symptoms to rule out the condition of patellar tendinopathy. Once the condition is evaluated then further treatment can be taken by the bowler. This can also help to improve the bowling mechanics of the bowler to enhance his performance on the field. The study's limitations included limited sample size and gender distribution. The results cannot be extrapolated to the female gender.

Conclusion

In the final analysis, it can be concluded that recreational fast bowlers exhibit a considerable prevalence of patellar tendinopathy. Their age and pain are linked in a unique way, which is significant.

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Conflict of Interest: None

References

1. Stretch RA. Cricket injuries: a longitudinal study of the nature of injuries to South African cricketers. *Br J Sports Med.* 2003;37(3):250-3. [PubMed]
2. Bartlett RM, Stockill NP, Elliott BC, Burnett AF. The biomechanics of fast bowling in men's cricket: a review. *J Sports Sci.* 1996;14(5):403-24. [PubMed] [Google Scholar]
3. Elliott BC, Hardcastle PH, Burnett AE, Foster DH. The influence of fast bowling and physical factors on radiologic features in high performance young fast bowlers. *Sports Med Train Rehabil.* 1992;3(2):113-30. [Google Scholar]
4. Ferretti A, Ippolito E, Mariani P, Puddu G. Jumper's knee. *Am J Sports Med.* 1983;11(2):58-62. [PubMed] [Google Scholar]
5. Lian OB, Engebretsen L, Bahr R. Prevalence of jumper's knee among elite athletes from different sports: a cross sectional study. *Am J Sports Med.* 2005;33(4):561-7. [PubMed] [Google Scholar]
6. Visentini PJ, Khan KM, Cook JL, Kiss ZS, Harcourt PR, Wark JD. The VISA score: an index of severity of symptoms in patients with jumper's knee (patellar tendinosis). Victorian Institute of Sports Tendon Study Group. *J Sci Med Sport.* 1998;1(1):22-8. [PubMed] [Google Scholar]
7. Hernandez-Sanchez S, Hidalgo MD, Gomez A. Responsiveness of the VISA-P scale for patellar tendinopathy in athletes. *Br J Sports Med.* 2014;48(6):453-7. [PubMed] [Google Scholar]
8. Thaigarajan KA, Parikh T, Sayed A, Gnanavel MB, Arumugam S. Cricket biomechanics analysis of skilled and amateur fast bowling techniques. *J Postgrad Med Edu Res.* 2015;49(4):173-81. [Google Scholar]
9. Anzilotti AW [Internet]. Growth plates. Nemours Kids Health; 2019 Jan [cited 2023 Feb 24]. Available from: <https://kidshealth.org/en/parents/growth-plates.html>
10. Rutland M, O'Connell D, Brismee JM, Sizer P, Apte G, O'Connell J. Evidence-supported rehabilitation of patellar tendinopathy. *N Am J Sports Phys Ther.* 2010 Sep;5(3):166-78. [PubMed] [Google Scholar]
11. Corrigan AB. Cricket injuries. *Aust Fam Physician.* 1984;13(8):558-62. [PubMed] [Google Scholar]
12. Florit D, Pedret C, Casals M, Malliaras P, Sugimoto D, Rodas G. Incidence of tendinopathy in team sports in a multidisciplinary sports club over 8 seasons. *J Sports Sci Med.* 2019;18(4):780-8. [PubMed] [Google Scholar]