THE PREVALENCE OF PRE-PATELLAR TENDONITIS AMONG UNIVERSITY COLLEGIATE ATHLETES

K.JEEVANATHAN¹, G.SWETHA², D. MALARVIZHI³

SRM COLLEGE OF PHYSIOTHERAPY, SRM IST

ABSTRACT

BACKGROUND: The pre-patellar tendonitis is a pain in the inferior pole of patella. There is inflammation in the patellar tendon. Athletes and other sports players are commonly prone to this condition during in the training activity.

OBJECTIVES: The prevalence of pre-patellar tendonitis among the university collegiate athletes.

METHODOLOGY: Non-experimental, cohort study, convenient sampling, sample size was 60 subjects. Subjects are 18 to 25 years, players with pain in training are included in the study. Subjects with previous surgical history in knee are excluded.

OUTCOME MEASURES: VISA-P score (VICTORIAN INSTITUTE OF SPORTS ASSESSMENT score) questionnaire.

RESULTS: In pre-patellar tendonitis, lowering of VISA-P score less than 60 score is symptomatic in players n=39 and in percentage (65%).

CONCLUSION: Increase the demand of speed in sports activity and reduction in functional activity.

Keywords: Pre-patellar tendonitis, tenderness, athletes.

INTRODUCTION

The patellar tendonitis are most common cause of pain in the inferior pole of patellar region and is commonly present in the athletes and sports players because of frequent jumping and kicking movement. The frequent jumping movement in the sports training activity produce stress, strain and overloading of weight in the infra or supra patellar pole. The frequent overloading of weight over the bottom of patella or knee cap cause patellar tendonitis (or) tendinopathy and otherwise it is known as "JUMPERS KNEE" or "RUNNERS KNEE". This is involved in the jumping sports such as volleyball, basketball, football, jumping athletics events, hockey which is require repetitive loading of patellar tendon. The overloading will cause inflammation over the tendon.

The patellar tendon arises from the anterior and distal surface of patella and inserts into tibial tuberosity of tibia. It plays a role in the function of transferring the weight from upper limb or trunk to the lower limb. During extension, the contraction of the quadriceps muscle pulls the patella towards the thigh and tibia also pulls through patellar ligament to extend the knee.¹

At sports training or practicing the loading of the body over the patella aggravates the pain and increase the demand of knee extension. The patellar tendon acts as the pulley system along with the force generated from tendon of quadriceps for knee extension. The pain occurs during instant loading.²

In athletes, the force and the magnitude of load induces thickening and tenderness of tendon.³ Exercise training of various sports activity produce stiffness of knee extension after the training of landing by vertical jump on volleyball or basketball.⁴The pain will be increased during when load is released. During the action of jumping, running, walking, and kicking the inflammation occurs in the patellar tendon. The rupture or tear of patellar ligament may result in jumping or falling due to stress. Partial tear may result in pain and irritation and complete tear results in dislocating of patella towards the thigh.⁹

In patellar tendonitis, there is increase the demand on speed and power of sports activities and exercise period because of the pain induced by the pain occurring activity. It is more common in the athletes; during the pain that they stop their training and sports competition. Due to pain, the athletes may not participate in competition or not involve in training, which increase the high load in patella.

Unilateral or bilateral limb may be involved.⁵There may be hypersensitivity in the patellar region. The players are not able to perform the squat, lunges, single leg hop movements, stair climbing and other weight bearing exercise due to pain.⁴ Atrophy and reduction of quadriceps muscles strength create a demand in balance.

The patellar tendon is helps in positioning the biggest sessamoid bone and it is known as patella. In normal persons and sports players, the tear or rupture of tendon which is caused by sudden falling down on the ground or slip from the steps. And in sports players it is caused by sudden slipped down during playing as the activity of jumping or kicking.

In patellar tendonitis, there is crunchy or popping sound will be present during the knee flexion and extension. Commonly the pain of patellar tendonitis is present in the anterior of knee. The pain was reduced in the players after the training by complete rest. Most of the athletes and other players are discontinued their sports because of the direct trauma or the overuse of patellar tendon in training.¹¹ They cannot attempt their normal life activity after the training and unable to sit down on the floor and also have difficult to climb down on the stairs after the few steps because of weight bearing on knee extension.

The university players or athletes are most commonly having the patellar tendonitis due to the frequently heaving sports training for their competition. The crepitus is present in the knee joint which produce the crunchy or popping sound while moving the limb. This condition is present in unilateral or bilateral patellar tendon.

Patellar tendonitis is associated on lesser amount of material and mechanical properties of tendon in elite athletes due to the increase volume of jumping activities.⁶A dorsiflexion of ankle is reduced in the dominant leg of the football players because loading amount is highly response.⁷

Persons with patellar tendonitis have difficult to climb down from the steps because of knee extension with full active weight bearing over affected side and it produce severe.

During frequent playing and training of the sports it cause micro-tear and the damage will produce dysfunction of movement and pain over inferior pole of patella.⁸ Error in the training, high in body weight, weight training and poor flexibility are the factors of tendinopathy and frequent jumping in concrete floor or the hard surface cause pain in volleyball players.¹⁰ The inflammation, tenderness, swelling are occurs in tendinopathy condition.

Athletes are present with or without the abnormalities in patellar tendon was identified by performance of single-leg decline squat movement with pain history of young athletes.¹²There is ankle joint dynamic movement and is related to patellar tendinopathy which is associated with the ankle and knee joint movement in large vertical jump of ground reaction force and it produces an increase in the amount of overuse of knee extensors.¹³

The players are both symptomatic and asymptomatic, accordingly palpate over the tendon in symptomatic players have tenderness with moderate sensitivity and in asymptomatic players there is very mild tenderness over the tendon and it is considered as normal.¹⁴

Mainly, the players or athletes have the strength in their quadriceps, ankle and knee which will reduce the tendinopathy. And mostly prone to the pre-patellar tendonitis are decreases in flexibility in hip extensors and ankle dorsiflexors.¹⁵

METHODOLOGY

The study design was non-experimental and the study type was observational. 60 subjects were choosen based on their convenience. The study setting was SRM SPORTS COMPLEX, SRM Institute Of Science And Technology. Age group of 18-25 years, both males and females, severe anterior knee pain over patellar tendon, pain increased in sports activities eg. JUMPING are included in the study. Recent patellar fracture, previous surgical history are excluded in the study.

PROCEDURE

The participants were selected according to the inclusion and exclusion criteria. The whole procedure is explained to the samples and written informed consent form was taken from the samples. **VISA score** (**VICTORIAN INSTITUTE OF SPORTS ASSESSMNT score**) questionnaire is given to the samples to fill the questions according to the severity of pain they having. And the palpation technique is performed in the patellar tendon to investigate about the tendonitis.

PALPATION TECHNIQUE IN PATELLAR TENDONITIS:

The palpation technique is performed to assess the patellar tendonitis in athletes and players. This technique is easy to assess the patellar tendon because the origin of tendon is most superficial. The position of subject was supine lying and the knee should be extended. The affected side is palpated first and then the contra lateral side is assessed. The one hand of the examiner should grasp the apex of the patella and pressure of other hand finger is helps to palpate the tenderness of patellar tendon in inferior pole of patella. And the condition is assessed unilaterally and bilaterally.

DATA ANALYSIS

The data obtained from the players were tabulated and entered in MS-Excel spread sheet. The data was analysed using descriptive statistics and average value of VISA-P score questionnaire was used to find the prevalence.

GRAPH-1



TABLE-1

	NO. OF PLAYERS WITH SYMPTOMATIC AND ASYMPTOMATIC				
VISA – P score	VOLLEYBALL	BASKETBALL	FOOTBALL	ATHLETICS	
25-35 %	4	5	3	3	
35- 45%	7	2	2	4	
45- 55%	3	2		2	
55- 65%	1	0	0	0	
65- 95%	8	4	3	6	

This table and the graph show that no. of players with symptomatic and asymptomatic of pre-patellar tendonitis among university collegiate athletes in the value of VISA-P score by percentage (%).

RESULTS

GRAPH-1 and TABLE-1 shows the number of subjects that falls under each percentage of scores are 25-35% (15 subjects), 35-45% (15 subjects), 45-55% (8 subjects), 55-65% (1 subject) and 65-95% (21 subjects).

The result of the study is pre-patellar tendonitis presents in the athletes or players with lower the score of VISA-P score questionnaire and below the score of 60% (n=39) are symptomatic in pre-patellar tendonitis.

The prevalence of current symptoms was highest in volleyball (n=15), in athletics (n=9), in basketball (n=9), and in football (n=6).

The percentage (%) of symptomatic is 65% (n=39) and asymptomatic is 35% (n=21).

DISCUSSION

The study was to find out the pre-patellar tendonitis in university collegiate athletes.

In the study, 60 samples from various sports which include volleyball, basketball, football, and athletics were taken on the basis of inclusion and exclusion criteria. They were observed on pre-patellar tendonitis through VISA-P score.

The result of the study is shows that there is statically measure of the Victorian Institute of Sports Assessment Patellar Tendinopathy Questionnaire.

Normally, the players are suffered from the symptoms of reducing in steps climbing, reduced Sin functional activities. In sports, the symptoms are limitation of time for playing, decreases in concentration of playing the sports activity and daily functions and performance reduce in game.

Pre-patellar tendonitis condition is found while it is proved in reduction of activities in pre and post matches. During match sessions, the paining in patellar tendon which produced discomfort and reduce power in playing activities.

As we found that number of players are injured due to the improper training method. Players are suffered with the pre-patellar tendonitis. The players do not know about the awareness of pre-patellar tendonitis due to the bio-mechanically and posture turning method.

Hence, this study revealed and given idea and certain knowledge about the pre-patellar tendonitis among university collegiate athletes. In future, the team coach and players must know about the knowledge and impact about this condition to prevent further damage.

The pre-patellar tendonitis is controlled by the strengthening and stretching technique of quadriceps or reducing the pain by using modalities.

Sorenson sc (2010) says volleyball players, in jumping the knee extensors commonly focuses on the absorption of mechanical energy and it reduces the work of joint and power of joint in sagittal plane.¹⁶

Zwerver J (2011) patellar tendonitis is higher in the volleyball players than in football players where the loading amount is larger in the knee extensors of younger age due to stature of body is tall and in higher on the body of weight it is associated with risk factors.¹⁷

Luciana de Michelis Mendonca (2016) investigate a clinical test to identify PTAs, the combined use of the tests had greater accuracy to is identify the individuals without PTAs.¹²

Hence, the strengthening and stretching of the quadriceps in the training or playing periods will reduce the pre-patellar tendonitis and increase the endurance of sports activity in the athletes or players with highly in jumping activities.

CONCLUSION

The study concludes that pre-patellar tendonitis overall symptomatic percentage is 65% (n=39).During the loading activity of volleyball, basketball, athletes and football players. Whether the more amount of load transmitted to the patellar tendon reduce the activity of playing performance, highly demand on speed in sports activity and decrease the functional activity.

REFERENCES

[1] Lian OB, Engebrestsen L, Bahr R. Prevalence of Jumper's knee among elite Athletes from different sports. Am J Sports Med.2005; 33:561-7.

[2] Malliaras P, Cook J, Purdam C, Rio E. Patellar Tendinopathy: Clinical Diagnosis, Load Management, and Advice for Challenging Case Presentations. The Journal of orthopaedic and sports physical therapy.2015 Sep:1-33.

[3] Kountouris A, Cook J. Rehabilitation of Achilles and patellar tendinopathies. Best practice & research clinical rheumatology.2007 Apr 30; 21(2):295-316.

[4] Bisseling RW, Hof AL, Bredeweg SW, Zwerver J, Mulder T. Relationship between landing strategy and patellar tendinopathy in volleyball. British journal of sports medicine. 2007 jul 1; 41(7):8.

[5] Gaida JE, Cook JL, Bass SL, Austen S, Kiss ZS. Are unilateral and bilateral patellar tendinopathy distinguished by differences in anthropometry, body composition, or muscle strength in elite female basketball players? Br J Sports Med. 2004; 38:581-5.

[6] Helland C, Bojsen-Moller J, Raastad T, Seynnes OR, Moltubakk MM, Jakobsen V, Visnes H, Bahr R. Mechanical properties of patellar tendon in elite volleyball players with and without patellar tendinopathy. Br J Sports Med. 2013 Sep; 47(13):862-6.

[7] AlirezaEsmaeili, Andrew M. Stewart, William G. Hopkins, George P. Elias and Robert J. Aughey. Effects of training load and leg dominance on Achilles and patellar tendon structure. International Journal of Sports Physiology and Performance. 2017 April; p.S2-122-S2-126.

[8] Jayantjoshi, prakashkotwal. Essential of orthopaedics and applied physiotherapy 2nd edition. Elsevier 2011 p.562.

[9] PieroVolpi, Emanuele Prospero, Antonio Orgiani, Alessandro Quaglia. Muscle and Tendon Injuries May 2017 pp.289-294.

[10] Lian O, Refsnes PE, Engebretsen L, Bahr R. Performance characteristics of volleyball players with patellar tendionopathy. Am J Sports Med. 2003; 31:408-413. [11] Garau G, Rittweger J, Mallarias P, Longo UG, Maffulli N. Traumatic patellar tendinopathy. Disabil rehabilitation. 2008; 30(20-22):1616-20.

[12] Luciana de MichelisMendonca, Juliana MeloOcarino, Natalia Franco NettoBittencourt, Ludmila Maria Oliveira Fernandes, Evert Verhagen and Sergio Teixeira Fonseca. The accuracy of the VISA-P questionnaire, single-leg decline squat, and tendon pain history to identify patellar tendon abnormalities in adult athletes, Journal of Orthopaedics & Sports Physical Therapy, Aug 2016, p.673-680.

[13] Richards DP, Ajemian SV, Wiley JP, Brunet JA, Zernicke RF. Relations between ankle joint dynamics and patellar tendinopathy in elite volleyball players. Clinical J Sport Med. 2002 Sep; 12(5):266-72.

[14] Cook JL, Khan KM, Kiss ZS, Purdam CR, Griffiths L. Reproducibility and clinical utility of tendon palpation to detect patellar tendinopathy in young basketball players. Victorian Institute of Sport tendon study group. Br J Sports Med. 2001 Feb; 35(1):65-9.

[15] Rodrigo ScattoneSliva, Therasa H. Nakagawa, Ana Luisa G. Ferreria, Luccas C. Garcia, Jose E.M. Santos, Fabio V. Serrao. Lower limb strength and flexibility in athletes with and without patellar tendinopathy, Physical Therapy in Sport,2016, 20, 19.

[16] Sorenson SC, Arya S, Souza RB, Pollard CD, salem GJ, Kulig K. knee extensor dynamics in the volleyball approach jump: the influence of patellar tendinopathy. J Orthop sports PhysTher. 2010 Sep; 40(9):568-76.

[17] Zwerver J, Bredeweg SW, Van den Akker-Scheek I. Prevalence of Jumper's knee among non-elite athletes from different sports: a cross-sectional survey. Am J Sports Med. 2011 Sep; 39(9):1984-8.

