International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 08 Issue: 06 | June - 2024 SJIF Rating: 8.448 ISSN: 2582-3930

Prevalence of Jumpers Knee in Basketball Players

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Abstract - Jumpers knee is a painful condition caused due to small tears in the patellar tendon. it mainly occurs in sports requiring strenuous activities which results in localized pain and tenderness of patella .It is also known as patellar tendinopathy, which is an overuse injury caused due to extensor mechanism it complies of a complex structure formed by quadriceps muscle and tendon, the patella and patellar tendon and the ligaments that surround and stabilize the knee (the quadriceps muscles are connected to the inferior pole of the patella by the common quadriceps tendon through a sesamoid bone, the patella..

***Key Words*:** Jumpers knee, Overuse Injury, Knee extensor mechanism, Quaadriceps.

1.INTRODUCTION

AIM: To evaluate the prevalence of jumper's knee in basketball players in Pune region.

OBJECTIVE: To find the prevalence of jumper's knee with the help of Single leg decline squat [SLDS].

Jumper's knee is a typical functional overload injury because it affects those athletes who submit their knee extensor mechanisms to intense and repeated stress, e.g. volleyball it is an insertional tendinopathy affecting, in order of frequency, the insertion of the patellar tendon into the patella (65% of cases), attachment of the quadriceps tendon to the patella (25%) and the attachment of the patellar tendon to the tibial tuberosity (10%). The frequent occurrence of this injury in athletes led to the study of factors that may contribute to its onset and aggravation. This condition can be seen in athletes where there is high demand for speed And power of leg extensors, these activities can include movements like landing, acceleration, deceleration or jumping, this can be caused due to micro tearing of knee extensor tendons because of repetitions of the movements during one single exercise session or if there is insufficient rest between sessions. In this the most affected component is the knee extensor mechanism in the inferior pole of patellar tendon where the patella inserts the quadriceps, multiple theories have been proposed for the pathogenesis of the patellar tendinopathy which is related mechanical, vascular and impingement conditions. However, these conditions tend to be overlooked as the overload theory can be taken more in consideration due to the incidence of jumpers knee.

2. Body of Paper

This study was undertaken considering all the mentioned points and the aim of this was to evaluate the prevalence of Jumpers knee in basketball players of Pune region, A total of 270 basketball players around the age of 15-25 were approached and were told to perform SLDS test.

[SLDS] Single leg decline squat was evaluated, it is a pain provocation functional diagnostic test, it is used to monitor the loading in athletes with patellar tendinopathy. [1,2]

Single leg decline squat is produced by the Australian strength and conditioning association (ASCA).[4] The players performed the decline squat standing on their dominant leg and flexing their knee, starting from complete extension to maximal flexion.[2]

The test was undertaken by a total of 270 basketball players undertaken considering all the mentioned points and the aim of this was to evaluate the prevalence of Jumpers knee in basketball players of Pune region, A total of 170 males and 93 females participated, based on the data collection 19% of population (N=50) in which (35=males) and (15=females) players could not perform the SLDS test at all, this is due to overuse of patellar tendinopathy. Jumpers knee is a functional overload injury because it affects those athletes who submit their knee extensor mechanism to intense and repeated stress (eg: basketball, high & long jumpers).[5] 60% of population (N=160) in which (100=males) and (60=females) could only perform a partial squat due to pain. The physical demand needed to play basketball as the players need to have proper rest and position while playing, during basketball practice, players realize 50–60 changes of direction and 40 -60 jump landing activities per match, which is 2 to 4 times greater than

any other sport repetitive jumping in basketball practice imposes recurring vertical ground reaction forces of up to 4 times body weight on the weight-bearing knee joint and the multidirectional nature of basketball requires constant acceleration and deceleration, forcing athletes to change directions or activities every 2 to 3 seconds, micro tearing of tendon due to these repetitive practice sessions, distinct sport-specific demands in basketball, including more frequent jumping and both single and double-leg landings and frontal plane movements can affect health and quality of life by limiting sports and activity participation for recreational athletes and can be career-ending for professional athletes, and these continuous practice sessions can cause micro tearing of tendon due to the repetitive practice sessions.[3,4,] 18% population (N=50) could not perform the test at all, 22% of population (N=60) in which (42=males) and (18= females) could perform the test without pain this could be due to proper rest between the practice sessions and due to maintaining proper posture while playing.[5]

While performing SLDS the pain was seen more in Male population than the female population. The single leg decline squat is performed with leg elevated and back straight, it has been described as a method to maximally load the knee extensors in an eccentric manner. This functional test is considered as a useful clinical assessment tool for patients with patellar tendinopathy, Furthermore it is used as an easy and effective rehabilitation exercise for patients with patellar tendinopathy. [5,6]

Standing in the decline position reduces the contribution of the calf to the squat, in this way the knee extensors and patellar tendon are maximally loaded, while performing SLDS the angles of the ankle and hip change significantly, so most of the studies have assumed that the less flexed ankle and hip joint during the decline squat displaces the body's center of mass further behind the knee joint, increasing the knee extensor movement and thereby the load on patellar tendon. The tears are caused due to accumulated stress on the patellar tendon which later results in Jumpers knee.[6,7]

It is a clinical representation of localized pain and discomfort on proximal tendon attachment to bone with high-level tendon loading, such as jumping and changing direction, these intense functional demands while playing basketball cause high load on the structures of the knee making it painful for the player to continue playing.[8]

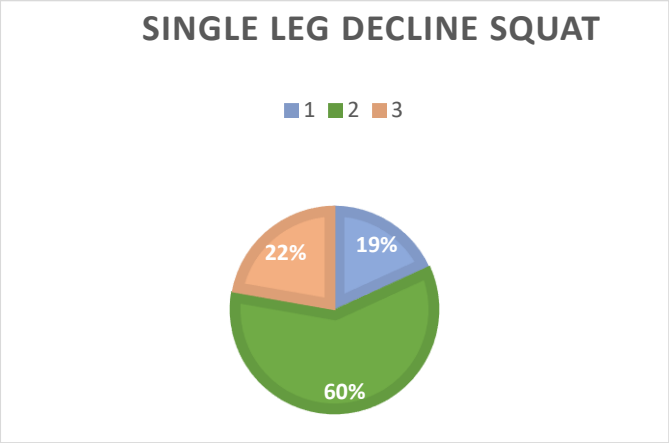
While playing if a basketball player needs to score a 3 point basket it is to be performed from outside the arc it is 23feet and 9inches from the basket, due to this the athletes generate greater amount of force to reach target, this produces force on the knee and lower leg muscles, thighs, glutes, calve and foot tendons, for this the player needs to have proper training and practice before playing the actual game, basketball matches have a time of 40 mins, which consist of 4 quarters that last for 10mins each and after 20mins they have their half time break, so during each quarter a player atleast changes 50-60 directions and makes40-60 jumps, which is why Jumpers knee can be seen in athletes where there is high demand for speed And power of leg extensors, these activities can include movements like landing, acceleration, deceleration or jumping, this can be caused due to micro tearing of knee extensor tendons because of repetitions of the movements during one single exercise session or if there is insufficient rest between sessions.[9,10]

Table -1:

SLDS	Percentage	right dominance	left dominance
COULD ONLY PERFORM PARTIAL SQUAT	60%	62%	38%
COULD PERFORM SQUAT	22%	75%	25%
COULD NOT PERFORM SQUAT AT ALL	19	40%	60%

Fig -1: Figure

Graph:



Based on the data collection 19% of population (N=50) could not perform the squat at all. 60% of population (N=160) could only perform the squat partially due to pain. 22% of population (N=60) could perform the squat properly without pain

3. CONCLUSIONS

This study has increased our understanding of patellar tendinopathy & pathology however, it concludes that players who participated were categorized based on SLDS [single leg decline squat] 60 % of players could only perform partial squat due to pain and 22% players could not perform the squat at all due to pain which concludes that most of players who participated were reported positive for SLDS as well.

This study led us to conclude that the prevalence of the jumper's knee in basketball players is (82%) and the players diagnosed are unaware and uneducated about this condition. The most important factor in the players will be to educate them on jumper's knee and to manage the it accordingly.

ACKNOWLEDGEMENT

It is my pleasure to express my gratitude to my college principal Dr.Albin Jerome(PT),for granting me permission to carry out this project.I acknowledge the constant support, valuable input and tireless effort of Dr. Amruta Khilwani (PT) who has reviewed my project constantly and extended her unconditional support, encouragement and guidance towards the timely completion of my project. I am indebted to my subjects for allowing me to assess them for my study and I would like to thank all the participants who gave their consent to be a part of this study.Last but not the least I extend my gratitude towards my parents and colleagues for motivating me in completion of project

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