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Prevalence of Scapular Dyskinesias in Novice Cricket Players

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ABSTRACT

Background*:* Although cricket is a noncontact sport, overuse and impact injuries are common since players engage in a wide range of physical activities, including running, throwing, batting, bowling, catching, and diving. Alterations in static scapular position and dynamic scapular motion is described as scapular dyskinesis and found in patients with various shoulder pathologies including impingement, instability, and labral and rotator cuff injuries.
Methodology*:* In this Observational study 30 subjects were included by using purposive sampling after obtaining ethical clearance from institutional ethical committee. Lateral Scapular Slide Test was used to assess scapular dyskinesis.
Result and Conclusion*:* Prevalence of scapular dyskinesis was present in 10% of total participants.

Keywords*:* Bowlers, batsmen, lateral scapular slide test, scapulo-humeral rhythm.

INTRODUCTION

Cricket is a national game and was started in England in the 16th century; it became the country's national sport in the 18th century [1]. It is a popular global sport which requires a combination of physical fitness, skill, and strategy. Although it is a noncontact sport, overuse and impact injuries are common since players engage in a wide range of physical activities, including running, throwing, batting, bowling, catching, and diving. A bat-and-ball game with complex rules, cricket involves physical fitness, skill, and strategy. It is played on a rectangular pitch centered on an oval field with 11 players on a team. Each side comprises batsmen, bowlers, fielders, and a wicketkeeper. After a run-up, bowlers have to deliver a hard ball toward the stumps 22 yards (20 m) away using a round-arm extended elbow action [2].

Fielders have the most upper limb injuries, possibly because of the forces involved in throwing long distances. Eccentric loading in the later phases of the throwing action can lead to rotator cuff lesions, most commonly from the mid-supraspinatus to the mid-infraspinatus [3]. Since fielding and bowling involve overhead throwing and abnormal torque across the shoulder joint, this activity is most at risk for shoulder injuries [1].

The stress of cricket is due to the repeated eccentric muscle damage resulting from the repeated decelerations that occur in batting and fielding. Substantial muscle strength is needed to reduce muscle damage arising from repeated eccentric contractions [3].

Numerous intrinsic risk factors for shoulder injury have been identified in overhead throwing athletes including amongst others, glenohumeral internal

rotation deficit (GIRD); total glenohumeral (GH) rotational range of motion (ROM) loss; scapula dyskinesis; variances in the acromiohumeral (AHD) distance. Extant cricket literature has primarily focused on the GH rotational ROM and scapula positioning alterations as a probable association with shoulder pain. The dominant shoulder of overhead throwing athletes (e.g. baseball, cricket, and tennis, volleyball, swimming) is thought to require a delicate balance between stability and mobility to achieve optimal performance. Cricketers demonstrated greater lower trapezius (LT), yet weaker serratus anterior (SA) strength. Scapula upward rotation requires the synergistic activity of primarily the middle and lower trapezius muscles, and secondarily, the SA. Scapula anterior tilting occurs as a result of PM inflexibility. Consequently, cricketers may not have sufficient strength of serratus anterior to counteract the scapula anterior tilt created by pectoralis major inflexibility. A resultant scapula position of downward rotation and anterior tilt may thus occur. Hence, this scapula position increases the risk for shoulder impingement as rotator cuff tendons are approximated towards the coracoacromial arch or glenoid lip [4].

Alterations in static scapular position and dynamic scapular motion, described as scapular dyskinesis, have been found in patients with various shoulder pathologies including impingement, instability, and labral and rotator cuff injuries. It has been thought that these alterations affect normal scapulohumeral rhythm (SHR) and shoulder arthrokinematics and therefore play a role in producing the dysfunctions [5].

Stability in the shoulder joint relies on static (capsule, ligaments, glenoid labrum) and dynamic (muscles around the joint, particularly the rotator-cuff muscles) stabilizers [6]. Muscular fatigue is identified as an inability to maintain force output, resulting in a decrease in performance. Muscular fatigue produces neuromuscular deficiencies within the muscle, thus predisposing a joint to injury and this affects the athletic performance [7].

Any alterations in the scapular positions can affect normal scapulohumeral rhythm and shoulder arthrokinematics and therefore it can produce dysfunctions. This can affect the performance of the player. Hence, there is a need to study prevalence of scapular dyskinesis in cricket players.

METHODOLOGY

Ethical clearance was obtained from concerned college committee, College of Physiotherapy, TMV, Pune. A visit was arranged to cricket academy in Pune. Permission was granted to conduct the study by the academy manager. The aim of the study was explained to the participants. Consent forms were given to those who wished to participate in this study. All the participant cricketers were screened for inclusion and exclusion criteria. Then entire procedure was explained to the participants. First test for scapular dyskinesis which is LSST was performed. And later test for shoulder proprioception was carried out which was LP-ART.

1] Scapular dyskinesis (Lateral Scapular Slide Test)

Patient position: Standing
Therapist position: Behind the patient
Procedure: This test is done by evaluating scapular symmetry as varying loads are placed on the supporting musculature. 3 positions of the upper extremity are proposed;

Position 1: the subject's arm is relaxed at the side (0° of humeral elevation)

Position 2: the subject places his hand on the lateral iliac crest.

Position 3: it corresponds to an internally rotated and abducted arm to 90°.

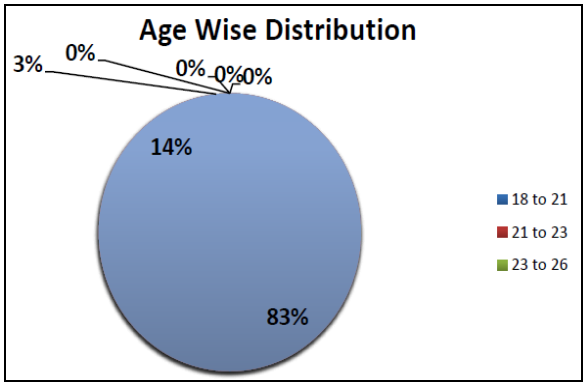
Two measurements are performed using a tape in each position in order to allow calculation of an average value. The measurements are taken between the inferior angle of scapula and the closest spinous process. This test describes patterns of abnormal motion in scapular dyskinesis based on simple bilateral visual observation of scapular position with the patients arm at rest, at the side and during elevation and lowering in the scapular plane.

RESULTS

Result No. 01 Age wise Distribution

Table no. 1

Age Group	No. of Individuals
18-21	25
21-23	4
23-26	1
Total	**30**



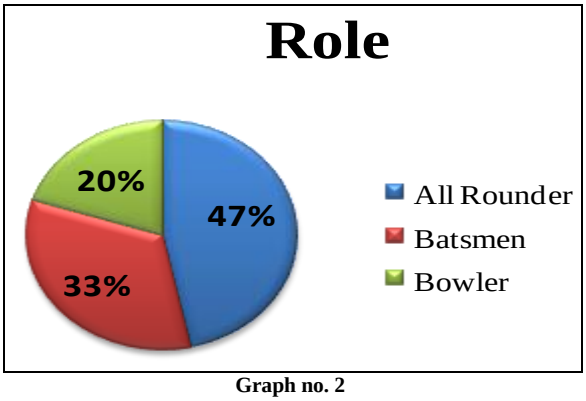
Graph no. 1

Interpretation: Graph no.1 shows that, 83% population belongs to the age group 18-21 years, 14% belongs to 21-23 years age group and remaining 3% belong to 23-26 years age group

Result No.02: Distribution of Role of Cricketers

Table no .2

Role	No. of Individuals
All Rounder	14
Batsmen	10
Bowler	6



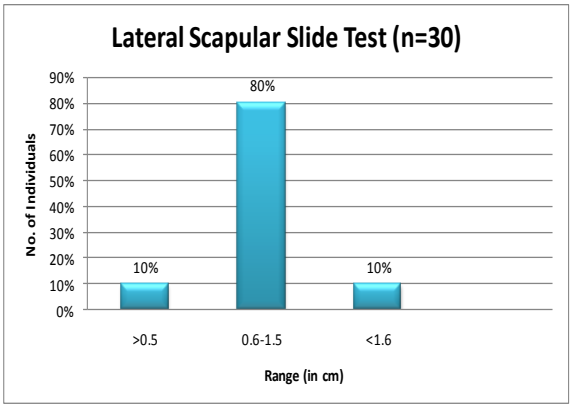
Graph no. 2

Interpretation: According to Graph no.2 47% participants belong to all-rounder category, 33% participants are batsmen and 20% participants are bowlers.

Result no. 3: Lateral Scapular Slide Test

Table no. 3

Range	Average
>0.5	10%
0.6-1.5	80%
<1.6	10%



Graph no. 3

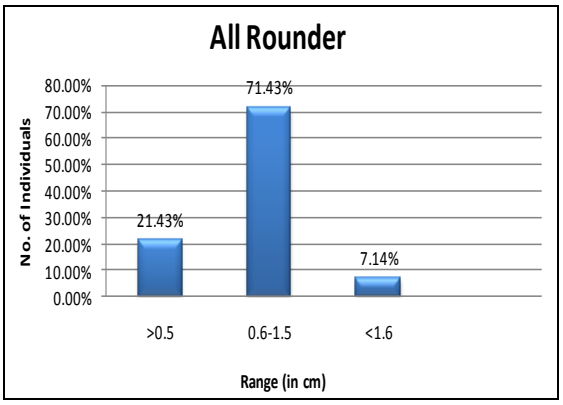
Interpretation: According to graph no.3 in lateral scapular side test 10% of cricketers' measurement was more than 0.5 cm, 80% of cricketers were in range 0.6-1.5 and 10%

were in the range <1.6 i.e. 10% of participants tested positive for LLST.

Result no. 4: Lateral Scapular Slide Test in All Rounder's

Table no. 4

Range	Average
>0.5	21.43%
0.6-1.5	71.43%
<1.6	7.14%



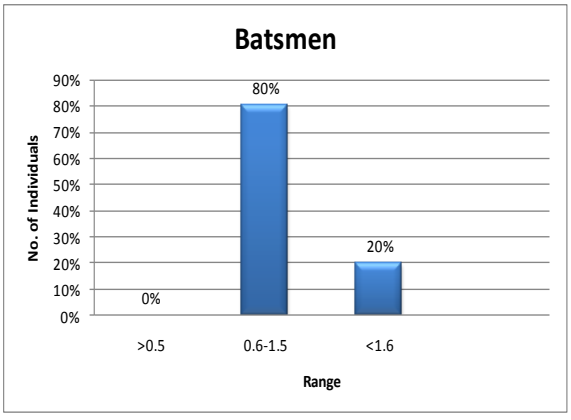
Graph no. 4

Interpretation: According to Graph no.4 in lateral scapular side test 21.43% of all-rounder participants measurement was more than 0.5cm, 71.43% were in the range 0.6-1.5cm and 7.14% were in range <1.6cm.i.e. 7.14% of all-rounder tested positive for LSST.

Result no. 5: Lateral Scapular Slide Test in Batsmen

Table no. 5

Range	Average
>0.5	0%
0.6-1.5	80%
<1.6	20%



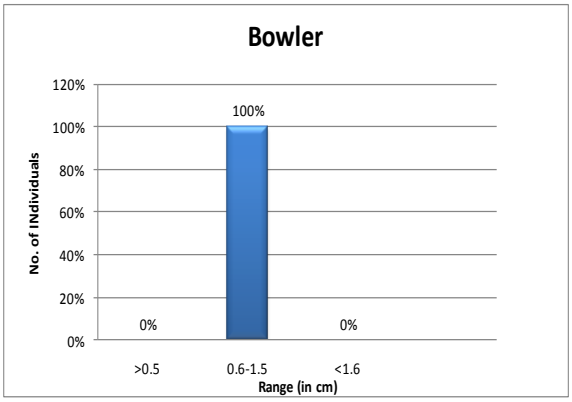
Graph no. 5

Interpretation: Graph no.5 shows that in lateral scapular side test 0% of batsmen measured >0.5cm, 80% of batsmen were in range 0.6-1.5cm and 20% were in range <1.6.i.e. 20% of batsmen tested positive for LSST.

Result no. 6: Lateral Scapular Slide Test in Bowlers

Table no. 6

Range	Average
>0.5	0%
0.6-1.5	100%
<1.6	0%



Graph no. 6

Interpretation: Graph no.6 shows that in lateral scapular side test 0% of bowlers measured >0.5cm, 100% of bowlers were in range 0.6-1.5 and 0% of bowlers were in range <1.6cm.i.e. 0% of bowlers tested positive for LSST.

DISCUSSION

Cricket is a global sport traditionally popular in the commonwealth nations. Since fielding and bowling involve overhead throwing and abnormal torque across shoulder joint, this activity is most at risk for shoulder injuries [1]. Alterations in static scapular position and dynamic scapular motion, described as scapular dyskinesis have been found in patients with various shoulder pathologies [5]. This can affect the athletic performance. Therefore, study for assessing scapular dyskinesis must be carried out.

Ethical clearance was obtained from concerned college committee and a visit was arranged to cricket club. The players were explained regarding the tests and consent was taken. Then the players were screened for inclusion and exclusion criteria. Males of Age group of 18-35 who've been playing

cricket since 3 years for minimum 2-3 days/week were elected for this study.

One test was performed to assess scapular dyskinesis which was lateral scapular side test (LSST) which had an intertester reliability between 0.77 and 0.85 [8] whereas specificity of this test was 26.8% [9].

According to Graph no.1 from the total of 30 participants 83% of population belonged to the age group 18-21, 14% belonged to age group of 21-23 and 3% belonged to the age group 23-26. The average value for age group was 19.5 with SD of ±2.012. Graph no.2 shows that from all the 30 participants 47% of players were all-rounders, 33% were batsmen and 20% participants were bowlers.

Graph no.3 shows that in lateral scapular side test (LSST) 10% of participants tested positive for the test that had measurement of more than 1.6cm which means that scapular dyskinesis was present in 10% of total players who participated. 80% were measured in the range 0.6-1.5 and 10% were below 0.5cm. This shows that 90% of total participants tested negative for LSST.

The scapula plays an important role in shoulder function. Healthy athlete's shoulders show adaptive patterns, particularly in the shape of significantly increased upward rotation combined with retraction of scapula. This is one of the reasons why 90% of the novice cricketers tested negative for this test. In one of the study Scapular dyskinesis was seen in both dominant and non-dominant side as the cricketers are involved in many activities like bowling, throwing, fielding, and batting. So it has been shown that they tend to use their non-dominant side as well for overhead activities [10].

In this study we also differentiated the statistical data for scapular dyskinesis according to the role in which the cricketers played such as all-rounder, bowler and batsmen. So the results were as follows.

As we can see in graph no.4 7.14% of all-rounder's tested positive for lateral scapular slide test. Whereas graph no. 5 shows that 20% of batsmen showed positive results in this test. And only 20% of bowlers were assessed in the entire research and entire population of bowlers tested negative for the lateral scapular slide test. Australian injury surveillance data from 1995 to 2001 revealed that shoulder injury prevalence among batsmen, fast bowlers, and spin bowlers was 0.3%, 0.9%, and 1.1%, respectively [11]. This might be one of the reasons behind such results.

Even though the players assessed were novice and had no history of any upper limb injuries there were significant positive results for scapular dyskinesis. A recommendation from this study is that a proper warm up and cools down session along with proper stretching is advisable for the players. Along with that to prevent scapular dyskinesis and to maintain proper scapular stability different exercise regimen for various muscle groups supporting the scapula should be initiated by the players. And even to improve joint integrity various weight bearing and strength training must be practiced. All these can help prevent injuries and improve overall performance of the player. Furthermore, coaches also need to be educated about the correct techniques to practice these exercises and to assist players in the same.

CONCLUSION

Prevalence of scapular dyskinesias was present in 10% of total participants.

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Conflict of Interest: The authors declare that there is no conflict of interest

Source of Funding: No funding was required for the study.

Ethical Approval: Approved

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