

Prevalence of Scapular Dyskinesia In Cricket Bowlers

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Abstract

Background

Bowling is an overhead activity which causes a ballistic motion of the body. Scapular Dyskinesia is believed to be more common in cricket bowlers due to their heavy reliance on unilateral upper extremity function. The scapula serves many roles in order for proper shoulder function to occur. Due repetitive overhead activity of cricket bowlers, there are more chances of Scapular Dyskinesia to occur in Cricket Bowlers hence the study was carried out.

Objective

The purpose of this study was to find out prevalence of Scapular Dyskinesia in Cricket Bowlers. One of the objective of this study was to find out wheather the Scapular Dyskinesia is associated with pain or not while doing throwing movement.

Methods

30 male Cricket Bowlers of age group 18 to 35 years with minimum experience of 2 years in bowling were selected to inclusion and exclusion criteria. Consent had taken from Cricket Bowlers prior to study. Scapular Dyskinesia had been evaluated by Scapular Dyskinesia test.

Data was collected and was statistically analyzed.

Result

Out of 30 participants, 3 participants were tested positive for Scapular Dyskinesia.

Conclusion

The study concludes that the Prevalence of scapular dyskinesia was found in 10% of total participants.

Key words

Scapular Dyskinesia, Lateral Scapular Slide Test, Cricket Bowlers.

INTRODUCTION

Visible alterations in scapular position and motion patterns have been termed as scapular dyskinesia and are believed to occur as a result of changes in activation of the scapular stabilizing muscles.⁵

The proper functioning of the shoulder is dependent on the many roles that the scapula plays, which include facilitating the smooth rotation of the scapula and humerus, providing a stable base for the rotator cuff, and serving as a link in the kinetic chain. These functions rely on uncompromised anatomy around the shoulder. However, the presence of bony or soft tissue injuries, muscle weakness, or inflexibility can impact the roles of the scapula, leading to changes in its resting position or dynamic motion. This altered scapular position can lead to 'Scapular Dyskinesia'. Although it occurs in a large number of shoulder injuries, it appears that Scapular Dyskinesia is a non-specific response to a painful condition in the shoulder rather than a specific.

The muscles mainly involved in Scapular Dyskinesia are upper and lower trapezius in addition to serratus anterior muscle. These muscles are the greater contributors of scapular stability and mobility. Cricket bowlers like other throwing sports involve repeated forceful ballistic arm actions which will put a great deal of eccentric load on the shoulder rotator cuff muscles.

Shoulder injuries are common among cricketers more particularly during throwing and bowling than fielding and batting. Throwing is an overhead activity which causes a ballistic motion of the body. Scapular Dyskinesia is believed to be more common in cricket bowlers due to their heavy reliance on unilateral upper extremity function. During bowling, the glenohumeral and scapular joint experience increased stress. Throwing motion occurs at above 90 degrees of abduction. The deltoid elevates the humerus and the rotator cuff adjusts the humeral head in the glenoid cavity. The pitching motion generates and transfers energy from the body to the arm to the hand and then the ball. Each part starts moving once the adjacent joint as reached the top speed with the top speed of the most distal segment. The scapula plays an important role in transferring this energy distally to the hand.⁸

Alterations in this transfer of power lead to increased stress on the glenohumeral and scapular-thoracic joints, thus increasing the the risk of injury.

The presence or absence of Scapular Dyskinesia needs to be determined during the clinical examination. An examination consisting of visual inspection of the scapular position at rest and during dynamic humeral movements, along with the performance of objective posture measurements and scapular corrective maneuvers, will help the clinician ascertain the extent to which the scapula is involved in the shoulder injury.

To find out the prevalence of Scapular Dyskinesia in selected Cricket Bowlers. 'Lateral Scapular Slide Test' is being used in this project. In Lateral Scapular Slide Test. A participant is positioned in arm abducted at 0,45, and 90 degrees in coronal plane and measurement taken from inferior angle of scapula to the closest spinous processes. The test is positive when there is difference of more than 1.5 cm in bilateral measurements of same participant.¹⁰

It remains uncertain whether Scapular Dyskinesia is the root cause or a consequence of shoulder injuries. This condition affects shoulder function and has been identified as a potential risk factor for developing clinical shoulder injuries. The literature on this topic is divided on whether it indicates a cause or manifestation of shoulder diseases, but there is a general consensus that it increases the risk of subsequent injury. Clinical identification of Scapular Dyskinesia is difficult and relies primarily on visual observation.

NEED FOR STUDY

Cricket is the most popular game in India. The bat and ball game with complex rules, involves physical fitness. Bowling is the high intensity activity that consist of various dynamic postures.

Bowling involves repetitive twisting, extension and rotation in short period and hours of repetitious practice produce a gradual deterioration in functional capacity of the body.

Due to variety of dynamic postures involved in bowling action. The scapula is more prone to Scapular Dyskinesia. The purpose of study is to evaluate the prevalence of scapular dyskinesia. So that it could be easy to early diagnose and will help in treatment strategy, modified exercises etc.

Hence this study is conducted to find out Prevalence of Scapular Dyskinesia in Cricket Bowlers.

AIM AND OBJECTIVES

AIM:

To find out the Prevalence of Scapular Dyskinesia in Cricket Bowlers.

OBJECTIVES:

- 1) To find out Prevalence of Scapular Dyskinesia in Cricket Bowlers using Lateral Scapular Slide Test.
- 2) To find out whether the Scapular Dyskinesia is associated with pain or not

MATERIALS AND METHODOLOGY

METHODOLOGY:

- Study design : Survey based
- Sampling method : Convenient sampling
- Study population : Cricket bowlers
- Sample size : 30
- Study setup : Sports clubs in city

MATERIALS :

- Pen
- Paper
- Measuring tape

INCLUSION CRITERIA:

- Cricket Bowlers.
- Participants between age group 18-35 years.
- Bowlers must be in sports since 2 years.

EXCLUSION CRITERIA:

- Individuals involved in any other sports.
- Bowlers with any recent surgery.
- Individuals not willing to participate.

OUTCOME MEASURES:

Lateral Scapular Slide Test:

Reliability: 0.77-0.85

Specificity: 26.8%

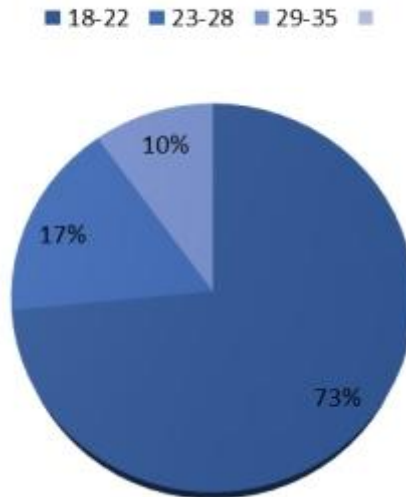
RESULT AND DATA ANALYSIS

The present study was conducted to study the prevalence of Scapular Dyskinesia in cricket bowlers. In the study 30 participants. The average age is (21.8, SD=5.12).

The data was analyzed using percentage.

Table 1 : Distribution of participants according to age

Age group	Number of participants	Percentage
18 to 22	22	73.6%
23 to 28	5	16.6%
29 to 35	3	10%

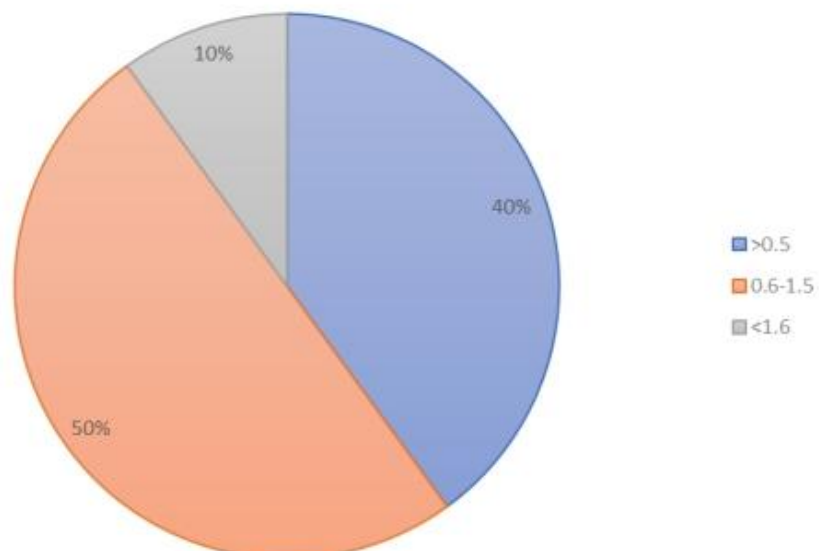


Graph 1 : Distribution of Total Participants According to Age Group

Interpretation : Graph 1 represents 73.6% of participants belongs to age group of 18 to 22, 16.6% of participants belongs to 23 to 28, and 10% belongs to age group of 29 to 35

Table 2 : Percentage of participants with respective readings (in cm)

Compared bilateral readings (in cm)	Average
>0.5 cm	40%
0.6 to 1.5 cm	50%
<1.6 cm	10%

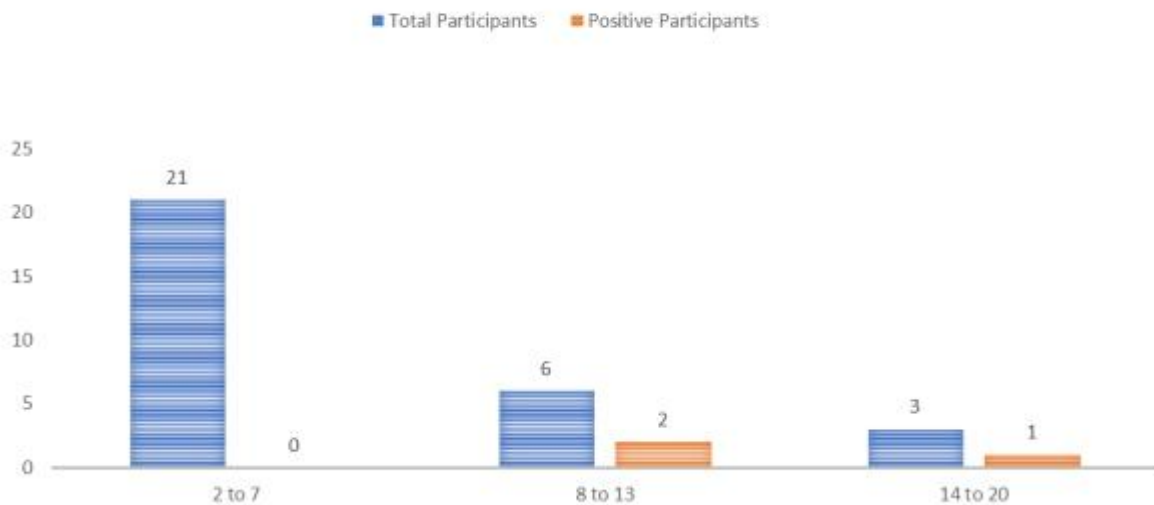


Graph 2 : Percentage of Participants According to Compared Difference Obtained from Bilateral Evaluation

Interpretation : According to Lateral Scapular Slide Test, 10% of participants shows positive test for Scapular Dyskinesia

Table 3 : Number of positive participants according to their experience in years in Cricket

Experience in years	Number of total participants	Number of Positive participants	Percentage of positive participants
2 to 7	22	0	0%
8 to 13	6	2	33%
14 to 20	3	1	33%



Graph 3 : Number of positive participants according to their experience in years

Interpretation : Graph 3 shows 0% positive result for Lateral Scapular Slide Test (LSST) in 2 to 7 years of experience among 21 participants, 33% positive result for LSST showing 2 participants positive among 6 participants of 8 to 13 years of experience and in 14 to 20 years of experience 1 participant tested positive among 3 showing 33% positivity for LSST

DISCUSSION

The study was aimed to find out Prevalence of Scapular Dyskinesia in Cricket Bowlers between age group of 18 to 35 years. A survey based study was performed among 30 participants using Lateral Scapular Slide Test as outcome measure. The Lateral Scapular Slide Test measures the amount of

scapular protraction in 3 positions of shoulder joint abduction, by measuring the distance from inferior angle of scapula to the closest spinous process.

Scapular Dyskinesia is the improper movement of the scapula during shoulder movement. The condition is thought to be a non-specific response to a painful condition in the shoulder and not a specific response to any particular glenohumeral pathology. It has been observed that Scapular Dyskinesia can negatively impact athletic performance. Therefore, a study must be conducted to assess Scapular Dyskinesia.

The study was carried out at cricket clubs from Pune and Mumbai cities. The total of 30 participants were examined based on the inclusion criteria. The test was explained to all participants and their consent on the consent form was taken. A study done by Siddhi S Tendulkar (2020) in Incidence of alteration of scapula position in bowlers involves the age group of 18 to 25 years, including both male and female participants. Melbourne Instability Shoulder Score (MISS) questionnaire has been used as outcome measure with mean result of 95.27 which was characterized as excellent. In the same study done by Siddhi S Tendulkar Lennie's test was performed as another outcome measure. The Lennie's test showed there is alteration of scapula position at both the points that is the spine of scapula and inferior angle in all the 50 participants on dominant side as compared to non dominant side⁸.

In present study shows that from the total population of 30 participants, 73.6% of Population belongs to age group of 18-22, 16.6% of population belonged to 23-28, and 10% of population belonged to 29-35. In Lateral Scapular Slide Test (LSST) 10% of participants tested positive for the test that had measurement of more than 1.6cm which means that Scapular Dyskinesia was present in 10% of total players who participated. 50% were measured in the range 0.6-1.5 and 40% were below 0.5cm. This shows that 90% of total participants tested negative for LSST. According to experience in years of participants in respective sport it represents in 2-7 years of experience 21 participants were there with 0 positive participants. In 8-13 years of experience 6 participants were there with 2 positive and in 14-20 years of experience 3 participants were there with 1 positive participant.

In shoulder function scapula plays an effective role. Healthy athlete's shoulders show adaptive patterns, particularly in the shape of significantly increased upward rotation combined with retraction of scapula. This is one rationale for why 90% of the inexperienced cricket players received a negative result in the examination. Even though the players assessed had no history of any upper limb injuries there were significant positive results for Scapular Dyskinesia. A recommendation from this study is that a proper warm up and cool down session along with proper stretching is advisable for the players. Along with that to prevent Scapular Dyskinesia 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

The study concludes that the Prevalence of Scapular Dyskinesia was found in 10% of total participants. The Scapular Dyskinesia is not associated with pain during movement in selected

population of present study. It's also concludes that the prevalence of Scapular Dyskinesia was more in more experienced Cricket Bowlers as compared to Cricket Bowlers with less experience.

LIMITATIONS

- Limited sample size
- High experience participants were less
- Only particular group of players were included

FUTURE SCOPE

- Comparison of Scapular Dyskinesia can be done with different sports
- Study can be done with different age groups
- Study can be done with different geographical locations

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