

[ORIGINAL ARTICLE]**Prevalence of Trunk Side Strain Injury in Cricket Fast Bowlers****Ms. Samiksha Lunkad¹, Dr. Mahendra Shende (PT)², Dr. Neha Ghugare (PT)³, Dr. Divya Jethwani (PT)⁴**¹Intern, ²Principal, ³Assistant Professor, ⁴Associate Professor, College of Physiotherapy, Tilak Maharashtra Vidyapeeth, Pune**ABSTRACT :**

Trunk side strain injury is reported most in cricket fast bowlers. This study was done with an aim to find the prevalence of trunk side strain injury in cricket fast bowlers and to find the factors associated with this injury. The factors taken into consideration were age, volume of cricket played, bowling arm, players standing and trunk height, active trunk lateral flexion ROM, active trunk lateral flexion range of motion ratio and side bridge endurance. First, to find the prevalence of trunk side strain injury in cricket fast bowlers, the sample population of 30 players was divided in 15 club and 15 state (or national) level players and second, to find factors associated with the injury they were divided into injured and uninjured players where 12 were injured and 18 uninjured. It was found that the injury was more prevalent in state level players as compared to club level players.

Keywords : Trunk Lateral Flexion Range of Motion, Side Bridge Endurance, Active Trunk Lateral Flexion Range of Motion Ratio

Introduction :

In India, cricketers join academies and start practicing. There are under 14, under 16, under 19, under 23 and open categories. BCCI and the State level cricket association conduct state level selection camps where they conduct different matches and tests in order to select players and send them for state level matches. The BCCI is in charge of organizing important domestic competitions.⁽²⁾ These competitions include the Ranji Trophy (first-class), the Duleep Trophy, the Inter-Zonal Twenty20 and one day tournaments, the Vijay Hazare Trophy (domestic one-day competition), the Irani Trophy (domestic three-day competition) and the Deodhar Trophy (domestic four-day tournament). Fast bowlers experience pain at the costochondral junction of the fifth and seventh costal cartilages, a condition known as "side strain."⁽³⁾ An injury to the intercostal muscles or tendons that pass behind these cartilages is referred to as a 'side strain.' Tenderness in this area is consistent with the concept that side strain injuries occur here.⁽⁴⁾ Majority of these injuries occur when the front foot contacts the ground and the front arm pushes the body through the bowling phase.⁽⁵⁾ The

front arm is pulled from an elevated position at this point, and the trunk is normally bent and/or turned to the opposite side. This puts the internal oblique under extreme stress while stretching it to its maximum length - ideal conditions for a muscle tear. Rest and rehabilitation are part of the treatment plan, with the goal of pain reduction, increased mobility and strength, and a change in bowling technique. With this research one can understand the frequency of injury and work towards preventing the injury by various ways like changing the bowling posture or strengthening the trunk muscles.⁽⁶⁾

Materials and Methods :

It was Cross Sectional, conducted at Cricket Academies in Pune. The study Population included State and Club Level players. Convenient sampling with Sample Size – 30 was used for the study. The inclusion criteria was Age – 18 to 30 years, gender – male, practicing fast bowling for at least 1 year, bowlers who have played state or club level Subjects with History of any recent surgery and current ongoing treatment for side strain were excluded from the study.

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Procedure :

This study was conducted based on the guidelines from "The Declaration of Helsinki". hence ethical approval was not required. Different cricket centers were approached and permission was obtained prior to the study. Assessment procedure was explained to the patient. Only those patients willing to give consent to participate in the study were included in the study. Participants in the study are fast male bowlers. Total 30 participants were recruited randomly using convenience sampling method for the research. Aim and objectives of the study were explained to the participants.

The number of bowlers with a history of side strain and their average age were recorded. Each limiting symptom's proportion was calculated. The normality of all continuous data was checked, and means (SD) or medians (IQR) were determined. Contingency tables were used to store categorical data. Between the injured and uninjured groups, at test was performed to compare mean age, standing and trunk height, active trunk lateral flexion ROM, lateral flexion ROM ratio, and side bridge endurance time. The x2 test was used to determine the relationship between bowling arm and first-class volume, as well as the risk of side strain injury in the past. P 0.05 was used as the significance level.

Results :

Data of total 30 players was collected for finding the prevalence of side strain injury in players. Informed consent was received from all 30 players.

Table 1 - Prevalence of side strain injury in club and state level players

	Club Level	State Level
Injured	3	9
Uninjured	12	6

Interpretation: 9 out of 15 players were injured in state level and 3 out of 15 in club level.

Fig.1 : Difference of prevalence of side strain injury in club level players

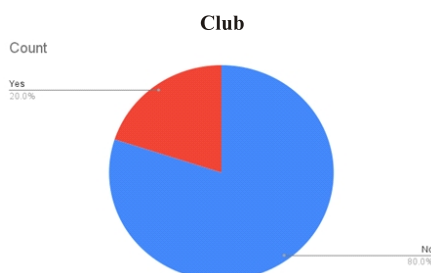
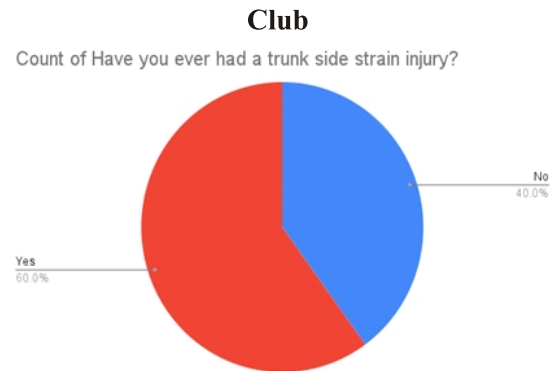


Fig. 2 : Difference of prevalence of side strain injury in state level players



Interpretation: 60% of players had trunk side strain injury in state level players and 16.67% in club level players.

Table 2 - Difference of volume of cricket played in club and state level players

Total Volume of cricket played		
	Club level	State level
5 years	1	3
Less than 5 years	11	8
More than 5 years	3	4

Interpretation: 7 players had 5 and more years of experience in state level compared to 4 in club level.

Table 3 - Time to recurrence of injury

Years to Recurrence	Number, n
0	1
1	2
2	0

Interpretation: All recurrences took place with 1 year of primary injury

Table 4 - Difference between injured and uninjured players' range of motion limiting symptom

	Range of motion limiting symptom towards and away from the injury side			
	Injured		Uninjured	
	Towards injury	Away	Towards	Away
Normal Stretch	3	8	17	17
Stretch / Pull	2	3	1	0
Jam / Squash	7	1	0	1

Interpretation: 7 out of 12 injured players had jam/squash symptom towards the strain and 11 out of 12 had normal stretch and stretch/pull away from the strain.

Table 5 - Difference of volume of cricket played in injured and uninjured players

Total Volume of cricket played		
	Uninjured	Injured
5 years	1	3
Less than 5 years	13	6
More than 5 years	4	3

Interpretation: 6 out of 12 injured players had 5 or more years of experience in professional cricket compared to 5 out of 18 players.

Discussion :

Incidence of trunk side strain injury in pre-erawas 0.6% which changed in T-20 era to 0.9%. [5] In sports, side strain usually manifests itself acutely on the side opposite the dominant arm. Prevalence was highest at younger ages in this study population. No bowler had a primary injury above the age of 25 years in this research. (7)

Over 55 percent of the muscle injuries reported by younger bowlers were lumbar and trunk ailments. Side strains were the most common - 93 percent, and the proportion of lumbar/ trunk strains from total muscle injuries decreased as the bowling groups grew older. The reason being that young bowlers lack the bone maturity required to cope with the full demands of first-class cricket and should not be expected to handle the same volume as older, more experienced bowlers.

Out of the total 30 players in this study, 12 had a history of side strain injury and 18 did not. We used the formula of prevalence, which is total number of injured players by total number of players in the study (the sample population), which came to 0.4 which is 40% of the fast bowlers had a history of side strain injury.

To differentiate the prevalence between state and club level players we had taken a sample of 15 state level and 15 club level players each.

The prevalence of side strain injury in state level players was 0.6 which is 60% and in club level was 0.167 which is 16.67%. This can be seen in table 1

and figures 1 and 2 given in results.

In the study done it could be seen that more the volume of cricket a player played, the more they were prone to trunk side strain injury. This can be clearly seen in the table 2 given in results.

In order to determine the factors associated with side strain injury, instead of dividing the data of total of 30 players into state and club level, we divided it into injured and uninjured players. The mean age of study population was 23.13 years (SD: 3.29, range 18-30). The mean age of injured group was (n=12) was 24.5 years compared with 22.22 years for the uninjured group (n=18).

Most injuries were on the opposite side to the bowling arm. Right side bowlers were 90% (n=27) among the total study population. Out of these bowlers, 33.33% (n=10) had sustained a side strain injury. In the same way, 66.67% (n=2) of the 3 left arm bowlers had earlier on undergone a side strain injury. Bowling arm was not associated with history of side strain injury.

Most common ages at primary injuries were 20 and 23 years, comprising 50% of primary injuries. Those aged 25 and under, represented 100% of the primary injuries. 25% (n=3) of the bowlers had suffered recurrence. Moreover, 33% of these bowlers suffered at least one more recurrence. The age at the time of each injury was used to calculate the time to the first recurrence in years as shown in table 3 in results.

There was no link between anthropometric measures of standing and trunk height and a history of side strain injury [mean standing height of injured bowlers 181.25 cm vs. 177.83 cm for uninjured bowlers] (t= 1.34 P=0.19). The mean trunk height of injured bowlers was 93.04 cm, compared to 91.36 cm for uninjured bowlers (t=0.94 P=0.36).

Active trunk lateral flexion range of motion - Injured bowlers had a 48.23 cm range of motion towards the injury side, compared to 47.81 cm for uninjured bowlers (t= 0.25, P= 0.81). The difference in mean of 0.42 cm is smaller than the minimum detectable change of 3 cm [1]. Injured bowlers had a 45.86 cm rom away from the injury side compared to 46.94 cm for uninjured bowlers (t=0.55, P=0.59).

The lateral flexion ROM ratio was defined as the ratio of amplitude of movement toward the injured side vs away from the injury side. Injured bowlers

had a mean ratio of 1.05 (SD = 0.12), while uninjured bowlers had a mean ratio of 1.01 (SD = 0.06) ($t = 1.18, P = 0.25$).

36.67 percent of bowlers ($n = 11$) attained first-class volume. In comparison to the uninjured group, a higher proportion of the injured group had reached first-class volume ($\chi^2 = 0.72, P = 0.39$). Only 16.67% of the uninjured group had achieved first-class volume. Reference – table 5 in results.

Injured bowlers had less lateral flexion range of motion toward the injury side, although this was not statistically significant. The limiting symptom of jam/squash was added because it has been reported by bowlers anecdotally, and it was also included in the reliability research. It is worth noting that neither sharp nor dull pain was reported by bowlers, even though it was included in the reliability research.

Injured bowlers were more likely than uninjured bowlers to have their lateral flexion ROM reduced by a typical stretch or stretch/pull on the injury side. This could be attributed to a loss of tissue contractility following an injury, however the link between injury recurrence and tissue contractility is unknown. It is worth noting that no bowler with lateral flexion away from the injured side reported either sharp or dull pain.

Side strain is a prevalent injury among fast bowlers who signed professional first-class cricket contracts. It is more likely to happen when they are younger, and it is linked to attaining the first-class volume playing level. Bowling arm, player height, active trunk lateral flexion ROM, and side bridge endurance were not linked to injury. Recurrence was prevalent, especially in the first year after the first injury.

Conclusion :

The prevalence of trunk side strain injury was more in state level as compared to in club level. The state level players played more volume of cricket, hence, prevalence was more common in them. Injuries were most common in early 20's. All first recurrences occurred within 1 year of primary injury. There was no association between bowling arm, player height, active trunk lateral flexion ROM, and side bridge endurance with the injury.

Conflict of Interest :

No conflict of interest is shown by authors.

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