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Research Article

ANALYSIS OF ROTATOR CUFF INJURY IN TENNIS PLAYERS USING LONG RACKET VS SHORT RACKET

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Abstract:

Background: Tennis is a famous sport worldwide but it involves sudden special moves that may cause severe musculoskeletal injuries to the player. Most common musculoskeletal injuries in tennis are overuse injuries of wrist and elbow. But certain other factors may also put stress on other body parts for instance, shoulder and calf region.

Objective: The purpose of this research is to find association of rotator cuff injury with length of rackets in Tennis Players.

Method and materials: An analytical association study method was used. The inclusive criteria are fulfilled by tennis players from different clubs and universities. Data will be collected after taking informed consent. A self-made questionnaire was used for the assessment of rotator cuff injury and pain in which Hawkin-kenedy test is applied.

Result: The result showed that P value of association of rotator cuff injury and length of rackets used by lawn tennis players was 0.488. P value .05 \leq was considered no significant difference.

Conclusion: There is no significant association between rotator cuff injury with the length of long and short rackets in Tennis Players. The probability of injury may depend on the body mechanics of the player.

Key Words: Pain, Rotator cuff injury, Sports, Tennis, Wrist Joint.

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INTRODUCTION:

Tennis is one to the most famous sports worldwide as it involves a remarkable amalgamation of aerobic and anaerobic moves making it an enticing game for the youth. Yet at the stage of competition, tennis encounters athletes towards a dynamic series of strokes and serves surging him towards an unusual profile of musculoskeletal injuries. So, we can say that to meet the physical demands of this sport, athletes put themselves at the venture of several musculoskeletal injuries. Hence, we can conclude that more than 50% of athlete departures from tennis can be ascribed to injuries. This highly increased prevalence of injuries has shifted the attention of many researchers towards the mechanics of playing tennis.(1).

Most common injuries resulting from tennis may be caused by overuse syndromes, presenting mostly as pain and inflammation. These overuse injuries can be created because of the disappointment of body to strike back to monotonous and microtraumatic occasions of over-burden. These injuries are most prevalent in lower extremity and also affect upper extremity and low back in the same ratio. These injuries are plantar fasciitis, Achilles strain, calf strain, hamstring strain, jumper's knee, tennis elbow, low back pain etc.(2) Hence, this study aims to compare the effects of long handle and short handle rackets on rotator cuff injuries in tennis players. From the recent studies, it has been known that much literature is available on the injuries of lower extremity and elbow but very few researches are available on shoulder injuries specifically rotator cuff injuries. So this research will investigate the frequency of rotator cuff injuries in tennis players. Additionally, this research will also compare the injury frequency of rotator cuff in players using long handles verses short handles.

Rotator cuff is a multiplex of four muscles: subscapularis in front, supraspinatus up word, infraspinatus and teres minor on back. When the arm is abducted overhead, rotator cuff muscles impinge between the acromion process and greater tuberosity of humerus. Due to this impingement, vascularity of supraspinatus may be compromised. This chronic irritation may ultimately lead to tendinitis. This inflammation can thicken the rotator cuff thus, hampering the functional activity of rotator cuff muscles.(3) Due to this, tennis players frequently encounters exaggerated external rotation at glenohumeral joint due to the weakness of internal rotators in the dominant shoulder. This pathology exhibits the existence of internal impingement following with rotator cuff tears in repetitive overhead motions. If not treated properly, it can lead to shoulder instability or even biceps tendinitis.(4) Another review explains that the glenohumeral insecurity can be because of the loss of

quality in outside rotators and scapular stabilizers took after by the loss of adaptability in inward rotators.(2).

OBJECTIVES OF THE STUDY:

To determine the association between rotator cuff injury and the length of rackets in Tennis players.

MATERIAL AND METHODS:

This study was analytical (associational) study. This study was completed in estimated period of 3 months after the approval from ANMC research committee. The data was collected through convenient non probability sampling technique. Data was collected from different tennis clubs and approachable universities.

- Lahore defense club.
- PHS club Saman Abad.
- Punjab University, Lahore
- University of Lahore.
- Fort Club, Multan Cantt.

Inclusion criteria

- Data was collected from the tennis clubs and from players of different universities.
- The players had experience of at least 1 year.
- Players practicing and playing for at least 25 hours a week in off and on seasons.

Exclusion criteria

- Players having any systemic and musculoskeletal disease and any recent trauma

Tool of Data Collection

- Hawkins- Kennedy test was used to assess the rotator cuff tendinitis.

DATA COLLECTION PROCEDURE:

Azra Naheed medical college and its ethical committee clearance was obtained before the formal conduction of research. The participants was informed about the cause of this research. Subjects of this study were tennis athletes playing in Lahore. The selected sample size was 138 athletes. The sample population will be selected on the basis of convenient sampling and the data was collected individually from the tennis clubs of Lahore and universities. The questionnaires were filled by the participants themselves except the ones having any language barrier. A written consent was taken by the authorities of registered players from clubs. It was obtained from the subjects as well. Privacy of collected data was ensured.

ETHICAL CONSIDERATION:

It was analytical (associational) study. Data was taken only after informed consent by the athletes. The researcher followed all rules and ethics and respected

athletes' values and morality. All medical ethics were considered.

STATISTICAL PROCEDURES:

All collected data were entered in computer program SPSS version 20 and analyzed through this software. For categorical variable, frequency or percentage were used and for discrete variables, mean and standard deviation were used. Chi-square test was used to determine the association between rotator cuff tendinitis and lengths of rackets used by tennis players. P-value of 0.05 will be considered significant.

RESULTS:

The mean age in years of the athletes using long rackets was 35.36 ± 6.26 . The mean age in years of the athletes using short rackets was 26.66 ± 4.40

Table-1: Descriptive statistics for age:

Types of Rackets	N	Mean \pm SD*	P-Value
Age			
Long Short	50	35.36 \pm 6.26	0.000
	50	26.66 \pm 4.40	

*SD= Standard deviation

Table-2: Descriptive statistics for experience:

Types of Rackets	N	Mean \pm SD	P-Value
Experience			
Long	50	7.40 \pm 2.82	0.000
Short	50	4.66 \pm 2.34	

The mean experience in years of the athletes using long rackets was 7.40 ± 2.82 . The mean experience in years of the athletes using short rackets was 4.66 ± 2.34 . Chi-square test of independence showed no association between rotator cuff injury and length of rackets used by tennis players. i.e. $\chi^2(1, N=138)=0.488, p>.05$.

Table-3: chi-square test of association between Rotator cuff injury and lengths of rackets.

Type of Handle	Test		Total	P-Value
	positive	negative		
Long	14	36	50	0.488
Short	11	39	50	
Total	25	75	100	

DISCUSSION:

As before mentioned, this research comprehensively elaborated the rotator cuff damage associated

particularly with the length of rackets in Tennis Players. Specifically, this study investigated the extent to which the injury of rotator cuff muscles could occur due to usage of variable lengths available in tennis rackets. Beyond this fact, it was the only study to measure any significant relationship between the occurrences of rotator cuff injury associated with the use of short length and long length of tennis rackets individually in recent few years. Hence, the generalized results revealed by chi-square analysis were that there was no significant relationship between rotator cuff injury and length of rackets used by tennis players. Additionally, there were no specific evidences reported with the use of short rackets and long rackets on the player's rotator cuff muscles. So, consequently the use of short length and long length tennis rackets would not produce any strain on player's rotator cuff muscles. And he can use his desired racket length while playing without any fear of having shoulder injury.

This research study compared equal participants who happened to use long rackets and shorter rackets. Eventually, most of the participants using long rackets produced a negative Hawkins Kennedy test (n=35) compared to the majority of those using shorter rackets also produced a negative status (n=39). So this result draws our attention towards the fact that overuse injuries of the wrist and elbow are more prevalent in tennis players rather than any other musculoskeletal injury. Furthermore, it identifies that the variable length of rackets does not put any strain on shoulder joint. Instead the altered biomechanics of the player's body can produce strains of shoulder joint, but this is out of scope of this research.

Therefore, the current study validates the past studies of tennis rackets carried out on tennis players. A study was recently conducted on tennis players in France, showing a positive comparison of asymmetrical injury frequency in dominant axial side and non-dominant axial side. The results were suggestive that players with a history of injury at the upper limb present altered dominant upper limb mechanics, and such asymmetrical proportions would be specific to the injury location. (10).

CONCLUSION:

There is no association between rotator cuff injury and the lengths of rackets. Thus, the null hypothesis is accepted. The result showed no significant association between rotator cuff injury and lengths of rackets used by tennis players because P-value(0.488) is greater than an alpha value(0.05).

LIMITATIONS:

The population of this study is limited to Metropolitan cities Punjab. Time Duration of the study was not enough to do it properly. Some official

authorities were not responsive towards the request for cooperation in study.

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