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RESEARCH ARTICLE

UPPER EXTREMITY MUSCULOSKELETAL OVERUSE INJURIES AMONG LAWN TENNIS PLAYERS
OF GWALIOR REGION: A SURVEY STUDY

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ABSTRACT

The objective of the study was to investigate the occurrence of upper extremity musculoskeletal overuse injuries among professional lawn tennis players belonging Gwalior region. The total of 86 professional tennis players (N=86) having at least 3 years of competitive experience were purposely selected for the study. The data was collected through interview method. The overuse injuries selected for this study were associated with Wrist, Elbow and Shoulder joint. The percentage analysis statistical technique was employed to analyse the data. Results of percentage analysis showed that maximum number of cases reported by players were injuries (overuse) associated with elbow joint (total 37% of sample population) whereas, injuries related to shoulder and wrist joint, female players have reported more cases of overuse injuries associated with wrist joint (female 30% and male 16%) and comparison to shoulder joint whereas, male have reported more case of shoulder injuries (mostly Rotator Cuff Tendinitis) in comparison to wrist joint (male 26% and female 10%).

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INTRODUCTION

Sports injuries are common in all range of competitive sport athletes. Now training has become streamlined as they focus their attention on their primary sports as a result, athletes are likely to over train some body parts while neglecting others. Professional sports players spend hours and hours for their training and practicing certain movements and actions every day resulting along with their development of skills they also undergo some common overuse injuries in sport. However, Mohan Lalit has suggested in his study in 2008 that the occurrence of injuries in games and sports may be caused by lack of physical fitness, overuse, and lack of proper equipments while some other reason of occurrence sports injuries may be due to improper training, lack of supply of energy and lack of understanding of the movement from biomechanical aspects. Sports injury are injuries that occurs to athletes while performing physical movement, no matter how tough or simple those movement are. Matthew J. Matva has

mentioned in his article about two types of basic injuries: acute injuries and overuse injuries. Acute injuries are usually the result of a single, traumatic event (macro trauma) and Overuse injuries are cumulative trauma disorders resulting damage to tissues, tendons, bones and joints usually occur over the course of time.

Robert & Ellenbecker in 1998 described in his book about tennis as a sport in which players have to respond skilfully to a continuous series of emergencies, such as sprinting to the ball, reaching, jumping, lunging, changing directions, stopping and starting. The overhead or serve, forehand and the backhand are three basic strokes used in tennis (Perry, 1983) and most of the tennis players keep on practicing frequently these basic strokes during their training schedule over the course of many years to develop their skill that leads to high level of performance (Ellenbecker, 1989). Ericsson done a study on tennis players and reported that it is estimated that players or athletes take about 10 years or 10,000 hours of training to attain the high performance skills of their particular sports as well as an event (Ericsson 1993; Ellenbecker, 1991). The continuous use of the upper extremities in producing force and direction to the ground strokes leads to repetitive overuse and high levels of

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mechanical and physiological stress on muscles, tendons and joints that often result in injury (Ellenbecker, 1991). Previous research has found that in case of professional tennis players as well as the recreational players, the most and major common injuries were associated with their elbow and the ratio was more than 30 % of the population (Priest, 1974, 1980). It is also found by the other researcher that the different types of racquet sports are characterized by different sizes and shapes of area, hurdle, missile and racquet (Lees, 2003) that can also one of the causes the injuries to the players.

So, the aim of the present study was to determine the occurrence of upper extremity musculoskeletal overuse injuries among professional lawn tennis players belonging Gwalior region but the different in measurement of courts, relative weight of racquet and ball along with playing techniques might be expected to produce differences in the injuries sustained by the tennis players.

MATERIALS AND METHODS

Selection of the subjects: A total of 86 professional tennis players (male 59 and female 27) from the population of Gwalior region were purposely assigned for the study. The assigned players were from various institutes/universities (LN.I.P.E., Jiwaji university, IIITM and MITS) and four professional lawn tennis clubs situated in Gwalior. All selected tennis players (male and female) above 16 years and had at least 3 years competitive experience of lawn tennis. Among them, total 62 tennis players (45 male and 17 female) were found, those were suffering from any kind of overuse injuries and among them, total 48 tennis players (38 male and 10 female) having selected upper extremity musculoskeletal overuse injuries i.e. shoulder injuries, elbow injuries and wrist injuries. The mean age of purposely selected tennis players (male and female together, N= 48) were (Mean±SD; 23.48± 2.30). The sampling procedure applied for the purpose of present study is given below in Figure 1:



Figure 1. Illustration of employed sampling procedure for selecting subjects

Statistical Analysis: A survey was conducted to determine the present status of upper extremity musculoskeletal overuse injuries of the lawn tennis players at Gwalior region. The collected data (in frequencies) was converted later in percentage form by using percentage analysis and presented through pie diagram.

RESULTS

The percentage of the selected overuse injuries in lawn tennis players (male and female) at Gwalior region are showed by using pie diagram, which is given below in Figure 2.

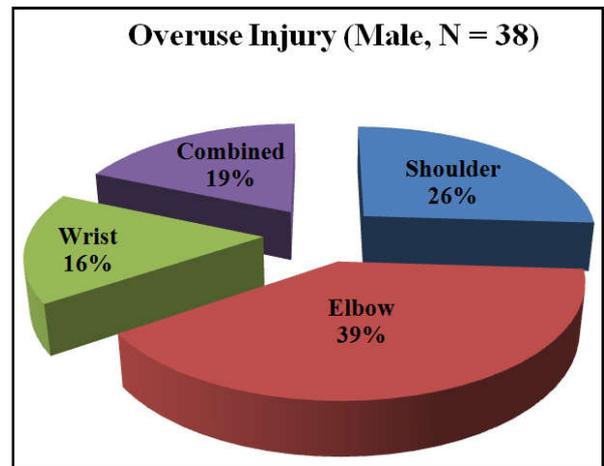


Figure 2. Overview of selected overuse injuries found in professional lawn tennis players (Male)

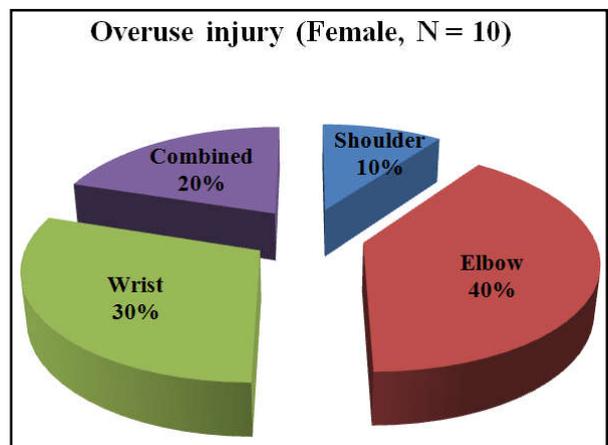


Figure 3. Overview of selected overuse injuries found in professional lawn tennis players (Female)

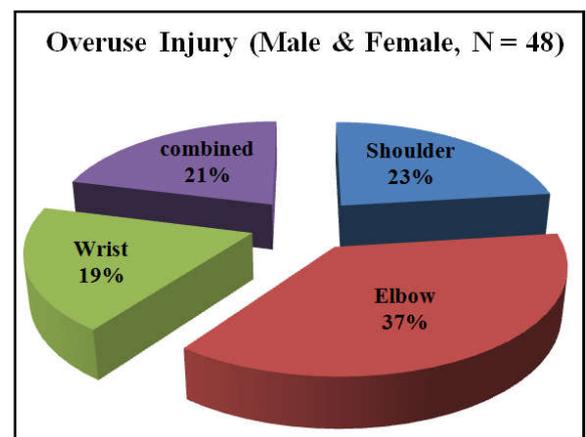


Figure 4. Overview of selected overuse injuries found in professional lawn tennis players (Male & Female Together)

DISCUSSION OF FINDINGS

The findings of the study relating to the survey of selected overuse sports injuries on professional lawn tennis players (male and female) revealed that much percentage of elbow

injuries (lateral tennis elbow, radial tunnel syndrome and pronator syndrome) were found in tennis players (37%) in comparison to shoulder and wrist injury. In addition, male and female has reported same percentages (male 39% and female 40%) of overuse injury related to elbow joint. However, Marx *et al.* has suggested in his study in 2001 that lateral epicondylitis is the most common cause of elbow syndrome. In addition, the various study has found that the more than 90 percent of tennis elbow (overuse injury) results from improper movements of the tennis single-handed backhand drive (Hang & Peng 1984; Ellenbecker, 1995)

In case of overuse injuries associated with shoulder joint, male players has reported more cases of shoulder injuries (26%) in comparison to female players (10%). Marx *et al.* in 2001 has suggested, the common overuse injuries associated with shoulder are frozen shoulder, aching shoulder, Rotator Cuff Tendinitis, SLAP Tear, sabacromial impingement, glenohumeral instability, internal impingement, mostly caused by lack of strength in rotator cuff tendons. Likewise, in case of wrist injuries (overuse), the female players has reported more case of wrist injuries (30%) in comparison to male players(16%) where as male and female both has reports total 19% of overuse injuries which was associated with wrist joint. The reason of reporting more case of wrist injuries (overuse) of the female players may be use of faulty playing techniques i.e. using wrist joint rather than using shoulder joint to produce more force in the ground shots as well as service (Elliott, 2006). DeQuervain's tenosynovitis, extensor carpi ulnaris tendinitis, Wrist tendinopathy, Intersection Syndrome, Wrist Flexor Tenosynovitis, Impingement syndromes, Distal radioulnar joint instability are some common overuse injuries associated with wrist joint while playing racquet games Marx *et al.*, 2001; Posner, 1977) . Although, most wrist injuries are secondary to overuse, direct trauma or an acute rotational episode can lead to wrist pain in tennis players, therefore it is important to ascertain the exact mechanism of injury, if appropriate, as well as how long the symptoms have been presented and whether they have progressed.

Conclusion

Based on the survey on professional tennis players at Gwalior region and within the limitation of present study following conclusion were drawn:

1. Among all related upper extremity musculoskeletal overuse injuries associated with selected joints (shoulder, elbow and wrist) the majority of players were having overuse injuries (mostly lateral tennis elbow) associated with elbow joint (total 37% of sample population).
2. Male and female both have reported same percentage (male 39% and female 40%) of elbow injuries (overuse).

3. In case of overuse injuries associated with shoulder and wrist joint, female players have reported more cases of overuse injuries associated with wrist joint (female 30% and male 16%) and comparison to shoulder joint whereas, male have reported more case of shoulder injuries(mostly Rotator Cuff Tendinitis) in comparison to wrist joint (male 26% and female 10%).

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