

ASSOCIATION OF MUSCULO-SKELETON INJURIES WITH ANATOMICAL SITES AMONG PLAYERS OF SELECTED SPORTS

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Abstract

The epidemiological study was undertaken to give an overview of relative frequency of musculoskeletal sports injuries documented by survey on randomly chosen inter-university level sportsmen pertaining to selected sport. Inter university level players (21 ± 2.5 years) from different sport (i.e. football, hockey, volleyball, basketball, athletics) completed a systematically prepared injury report questionnaire. According to the criteria marked by the researcher, the participants who had to keep away from the practice sessions for more than one week due to reported injury were considered as injured. The self report injury questionnaire included various parameters to be enquired such as: type of sport, age, type of injury and anatomical site of injury etc. The data was analyzed using chi square and descriptive statistics. The results of the study suggested that the sports such as football and basketball which include cutting and turning maneuvers are prone to lower limb injuries (i.e. knee and ankle). Badminton players sustain injuries on almost all the major anatomical sites. The results showed that track & field athletes mostly suffer with hamstring (37%), ankle (23%) and knee injuries (21%). Weight lifters were much prone to Back (47%) and knee (27%) injuries. Chi square test revealed a significant association i.e. p value ($.000 < 0.05$) among different anatomical sites of injuries and selected sport.

Keywords: Musculo-Skeleton, Injuries and Anatomical Sites

Introduction

Competitive sports make a tremendous demand on the physical condition, vitality, endurance and mental powers of participants. Only athletes in the finest condition can withstand the wear and tear of the competitive sessions. Only finest of them can play to the best of their ability (Jain, 2005). Participation in sporting activities is growing on an annual basis, with rising levels of achievement in sports, redefining athletic performance boundaries. A substantial number of sports and exercise participants suffer injuries each year, and it is widely believed that sports injuries are becoming more and more prevalent.

Injuries may also occur depending upon the nature of sport. As each sport, like team or individual, contact or non contact, has got unique biomechanical and associated physiologic stress/demands placed upon the musculoskeletal system (Lawrence M., 2005). To tackle these demands basically

aroused due to the nature of sport, training and competition stress is given. The training stress in various form such tactics, technique, or exercises has an ability to injure or disturb the normal functioning of the body. Sometimes due to the over enthusiasm, higher aspirations or negligence, athletes ignore minor injuries and in stretched time period fall prey of irreversible chronic injuries. For instance, Stress fractures in runners common. The causes are similar to those leading to the repetitive stress problem of soft tissue and base. Injuries may also take place due sudden involuntary and uncontrolled impact of external or internal force, commonly known as acute injuries. Injuries to the hamstring muscles and tendons are common to the variety of running sports. (Robert and David, 1989). Injury patterns are common to specific sports. Understanding which injuries occur with these sports allows the examiner to diagnose and treat the athlete easily. (Plancher, 1996). It is essential for every athlete to know about major injuries which can occur during participation in sports and recreational activities. In fact, the increase in incidences of injuries in sports and recreational activities has created the need. Treating sports injuries is often difficult, expensive and time consuming, and thus, preventive strategies and activities are justified on medical as well as economic grounds. With an estimated cost for these injuries of almost a billion dollars per year, the ability to identify risk factors and develop prevention strategies has widespread health and fiscal importance (Letha Y.Griffin, 2000)

Method

For the purpose of study (203) inter-university level players from different sports (i.e. football, hockey, badminton, volleyball, basketball, and athletics) completed a injury report questionnaire. The subjects with a mean age of 21 ± 2.5 years were randomly chosen. According to the criteria marked by the researcher, the participants who had to keep away from the practice sessions for more than one week due to reported injury were considered as injured. The self report injury questionnaire was prepared by the researcher on the basis of review of literature and expert's consultation. The questionnaire had undergone two stages of pilot run and finally shaped on the basis of conclusions extracted out of the responses from pilot run. The participants were also assured for the confidentiality. To assess the prevalence of the sports specific injuries in selected sports, four sites in body namely

ankle, knee, back, and shoulder were selected. The standard case record included the following parameters: type of sport, age, anatomical site of injury. The data obtained from

standard case records were analyzed in a computer database. Statistical analysis was carried out using Chi-square test and descriptive statistics was also presented. P-values less than 0.05 were considered to be statistically significant.

Results

TABLE 1
NAME OF SPORT SITE OF INJURY CROSS TABULATION

| Name of Sport | Site of injury | | | | | | |
|----------------|----------------|------|-------|-----------|------|----------|-------|
| | | Knee | Ankle | Hamstring | Back | Shoulder | Total |
| Football | Count | 12 | 15 | 4 | 5 | 2 | 38 |
| | Expected Count | 11.0 | 9.2 | 5.7 | 7.2 | 4.8 | 38.0 |
| Athletics | Count | 10 | 9 | 16 | 5 | 3 | 43 |
| | Expected Count | 12.4 | 10.4 | 6.5 | 8.2 | 5.5 | 43.0 |
| Weight lifting | Count | 6 | 1 | 2 | 9 | 4 | 22 |
| | Expected Count | 6.4 | 5.3 | 3.3 | 4.2 | 2.8 | 22.0 |
| Badminton | Count | 4 | 6 | 4 | 7 | 7 | 28 |
| | Expected Count | 8.1 | 6.8 | 4.2 | 5.3 | 3.6 | 28.0 |
| Volleyball | Count | 8 | 4 | 0 | 3 | 4 | 19 |
| | Expected Count | 5.5 | 4.6 | 2.9 | 3.6 | 2.4 | 19.0 |
| Basketball | Count | 10 | 7 | 0 | 4 | 2 | 23 |
| | Expected Count | 6.6 | 5.6 | 3.5 | 4.4 | 2.9 | 23.0 |
| Total | Count | 50 | 42 | 26 | 33 | 22 | 173 |
| | Expected Count | 50.0 | 42.0 | 26.0 | 33.0 | 22.0 | 173.0 |

From table 1 it is evident that the number of injuries at different anatomical sites is different in counts. Knee injuries (10) and ankle injuries (15) has highest count in football, hamstring injuries (16) in athletics, back injuries has most frequent occurring in sport of weight lifting and shoulder injuries (7) have most frequently occurred among badminton players.

TABLE 2
CHI-SQUARE TESTS

| | Value | df | Asymp. Sig. (2-sided) |
|------------------------------|---------------------|----|-----------------------|
| Pearson Chi-Square | 50.844 ^a | 20 | .000 |
| Likelihood Ratio | 53.155 | 20 | .000 |
| Linear-by-Linear Association | .258 | 1 | .611 |
| N of Valid Cases | 173 | | |

Table 2 shows the value of chi square as 50.844, which is significant at 1% level as p value is .000. Thus, we may reject null hypothesis and conclude that there is a significance association between selected sports and different sites of injury. In other words it may be concluded that pattern of occurrence of injuries at different sites is different in various sports.

Discussion of findings

Ankle injuries were found to be most frequently occurring in football (39%) and basketball (30%), closely preceding the frequency of occurrence of knee injuries. These sports are

prominently marked by explosive burst of speed in linear and non linear fashion, cutting and turning maneuvers, jumping and landing increases the risk of injuries in lower body. While

playing these sports, the movements are not pre-planned and largely influenced by the movement of opponent. Most Often, to gain the possession over the ball in critical circumstances, the players are forced to make movements which challenge the normal range of motion on ankle and knee consequently hampering the equilibrium of biomechanical forces. Hence players incur themselves with injuries like sprains, dislocation, ligament tears and a vast range of complicated injuries. These sports pose the risk of collision and other traumatic injuries as the underlying cause may be their semi contact nature. Letha y. griffin in a study also concluded that the highest incidence of the injuries related to ACL are is in individuals 15 to 25 years old, who participate in pivoting sports

Among badminton players, injuries are distributed in almost all the anatomical sites with majority in shoulder (29%), ankle (22%), and back (21%). Badminton players may suffer injuries due to a wide range of factors including improper warm up, inefficient technique, fatigue etc. although shoulder injuries were found to be significantly associated with badminton players as most overhead shots exert stress on the muscles and joints.

Ankle injuries may occur in case an athlete steps on his partner's foot and land with a plantar flexed, inverted and supinated foot with most sprains occurring on the ligaments outside the ankle joint. Shoulder injuries have also a major share with a percentage occurrence of (29%). These are very common in Badminton as this game involves a lot of overhead shots and usually caused due to problems in the rotator cuff. Knee injuries (22%) also feature frequently in the badminton players chiefly caused by a sudden twisting movement of the knee during footwork resulting in the tear of the meniscus.

The back injuries (41%) pose greatest risk to the weight lifters as they have to tackle large forces in the form of heavy external weights. The injuries occur mostly in the lumbar area of spine, since the lumbar spine is the only connecting column between the upper and lower parts of the body, all the forces must be transmitted via these structures and most common type of injuries are muscle strains, ligament sprains, lumbar vertebral fractures, disc injuries, and neural arch fractures. Working on the strengthening of abdominal muscles and flexibility of lower back may reduce the high risk of back injuries (Alexander, 1985).

Hamstring injuries are reported to be mostly associated with the track and field athletes (37%). Hamstring injuries are hazardous in nature because of relatively slow healing pace and their reoccurring nature. The condition is goaded by inadequate rehabilitation. Several etiological factors have been proposed as being related to injury of the hamstring musculotendinous unit. They include: poor flexibility, inadequate muscle strength and/or endurance, dyssynergic

muscle contraction during running, insufficient warm-up and stretching prior to exercise, awkward running style, and a return to activity before complete rehabilitation following injury

(James C. Agre). Muscle strength imbalances between the hamstring and quadriceps muscle groups may be another factor aggravating the chances of occurrence of hamstring injuries.

Volleyball is a source of direct injuries and chronic overloads of the joints, which indirectly results in traumas and permanent dysfunctions. Knee (42%) along with ankle (21%) and shoulder (21%) injuries is a major cause of concern for the volleyball players (Dworak L.B. et al). Patellar tendinosis/tendonitis is the most frequent overuse injury in volleyball. Jump rate is a major concern for the volleyball players which contribute to majority of injuries. Athletes who generate greatest power during vertical jumping seem to be at great risk. Volleyball is a sport found with greatest jump rate (William W.)

D F Murphy et.al conducted systematic review of literature to identify potential risk factors associated with occurrence of injuries and categorized the risk factors into extrinsic and intrinsic risk factors. Extrinsic risk factors include level of competition, skill level, shoe type, use of ankle tape or brace and playing surface. Intrinsic risk factors include age, sex, previous injury and inadequate rehabilitation, aerobic fitness, body size, limb dominance, flexibility, limb girth, muscle strength, imbalance and reaction time, postural stability, anatomical alignment, and foot morphology

Practical implications

Although injuries are most unpredictable in nature and the association could not be restricted to particular sports. But keeping the view in mind that every sport has got specific demands in the terms of technique, motor abilities, involvement of specific musculoskeletal areas etc. in particular movement.

So, the involvement of sportsmen in an activity (either training or competition) designed for attaining competitive edge in sports may expose them to a particular category of injury including on the basis of different musculoskeletal sites. The present study may cater the need of creating a database of various aspects of injuries, based on which a greater insight may be developed which would be helpful in tackling sports injuries.

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