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"COMMON SHOULDER INJURIES IN BOXER'S

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ABSTRACT

Objective: To find out overall, gender specific, site specific and type of injury specific prevalence rate of musculoskeletal injuries in boxing players.

Methodology: Study Design: Cross sectional, survey study, retrospective model.

Sample size: 105 boxing players (73 males and 32 females).

Method: Injury data was collected from each player using modified Nordic Musculoskeletal Injury Questionnaire.

Data analysis: Data was entered into MS Excel for further analysis.

Results: 48 players out of 105 was injured leading to 46% overall prevalence of injury among boxing players. Males injured slightly higher than females. Upper limb injuries were the most common area followed by lower limb. Wrist & Hand, Knee & Leg, Low back the most common sites of injury. Sprain and strain accounted more than 90% of total injuries.

Conclusion: Prevalence of musculoskeletal injuries is high among boxing players. Conditioning by coaches and early rehabilitation by physiotherapists are essential to reduce the injury rate in this population.

Keywords: Gender difference, Incidence, Soft tissue, Sprain. Strain, Injury rate

INTRODUCTION

Boxing, which is called the ''noble art'' and is historically known as pugilism, is one of the oldest combat sports across all of human culture. According to the International Boxing Association, the first proof of boxing's appearance was discovered in Egypt and dates to approximately 3000 B.C. and boxing most likely appeared in Ethiopia as early as 6000 B.C. Historically, boxing first appeared as an Olympic sport at the ancient Olympic Games in 688 B.C.The first amateur competition took place in 1860, and the Amateur Boxing Association appeared in London in 1880. Boxing consists of stand-up fist fighting and should therefore not be confused with other fighting styles such as kickboxing, Savate or French boxing, Muay-Thai or any other combat sport that allows the use of feet, elbows or knees to strike. The Amateur International Boxing Association (AIBA), which is the official world organization of amateur boxing, has 196 affiliated national federations.

The most wellknown AIBA events are the Olympic Games and the World Championship. Boxing was on the program of the Olympic Games for the first time in St. Louis in 1904, and, since 1920, boxing has been included in the program of the Olympic Games without interruption. A total of 286 boxing athletes, 36 of

whom were women (competing for the first time at the Olympics), representing 79 countries, participated in the last Olympic Games.

As a full contact combat sport, the aim of amateur boxing is to succeed in delivering a clean and correct punch to the opponent without being punched in return [5]. During an amateur boxing match, opponents are only permitted to use their fists [6], with the knuckle area of the glove towards the target area (i.e., any part of the front and sides of the head or body above the belt) on the opponent. The scoring system in boxing is a function of the following criteria, which are analyzed by five judges: number of quality blows on the target area, domination of the bout, competitiveness, technical and tactical superiority and infringement of the rules [7]. As in almost all other types of combat sport, boxers are categorized into a series of weight classes that are intended to promote fair competition by matching opponents of equal body size, strength and agility.

OBJECTIVES

1. To determine the prevalence of musculoskeletal disorders in shoulders injuries in boxers.
2. To study the relationship of the musculoskeletal disorders with the risk factors in shoulders injuries in boxers.

NEED FOR THE STUDY:

As per the literature available it has been found that common injuries among boxers are risk 29 %, Knee (), ankle and back. But the shoulder injuries are very less emphasized. During the analysis of common injuries among boxers due to least prevalence so present study is an injury to figures out the most common shoulder injuries among boxer during the game.

REVIEW OF LITERATURE

1. Roshan Gopal Adkitte, (2006), studied 209 boys physical fitness coming from the age group 9 to 12 years through AAHPERD physical fitness test. Their timely physical fitness was recorded through the test of 1 mile running or walking, pull ups, sit ups, elasticity and skinfolds. Although it was told to fill up a permanent application.

2. Nicholas J Lemme (2010) conducted a study that defines physical fitness as "the capacity to carryout reasonably well various forms of physical activities without being unduly tired and includes qualities important to the individual's health and well being."

3. Hardayal Singh (2015) : conducted a study that speed is the ability to execute motor actions, under given conditions, in minimum possible time. Speed ability is highly movement specific. Moreover, speed unlike the other two conditional abilities ,(strength and endurance) depends much upon the nervous system and as a result is of more complex nature and is comparatively less trainable. He further states that speed appears are: reaction ability, movement speed, acceleration ability, locomotors ability and speed endurance. It is very interesting to note that these different types of speed abilities are relatively independent of each other, i.e. they do not correlate with each other. Speed of each type and of each body type is specific.

4. Reza.Md.Nasim (2000) conducted a study to compare the physical fitness between adolescent boys of Bangladesh and India. 80 adolescent school boys in India as well as Bangladesh were chosen at random for the present study. The age of the subjects ranged from 14 years to 16 years, as per their school records. Here AAHPERD youth fitness test was chosen by the investigator. In this study the following variables were the criterion to measure physical fitness i) arm and shoulder strength was measured by pull-ups, ii) abdominal strength and endurance were measured by sit-ups, iii) speed and agility were measured by shuttle run, iv) endurance was measured by standing long jump, v) speed was measured by 50 yard dash vi) endurance was measured by 600 yard run walk. In the relation of physical fitness the main difference was computed by employing statistical techinuque of 't' ratio. From the test result it was found that in respect of physical fitness, adolescence of Bangladesh and India stood as per there was no significant difference as obtained from the results. Reza.Md nasim.

5. James F. Sallis (2000). Understanding the factors that influence physical activity can aid the design of more effective interventions. Previous reviews of correlates of youth physical activity have produced conflicting results. A comprehensive review of correlates of physical activity was conducted, and semi-quantitative results were summarized separately for children (ages 3-12) and adolescents (ages 13-18). The 108 studies evaluated 40 variables for children and 48 variables for adolescents. About 60% of all reported associations with physical activity were statistically significant. These consistently related variables should be confirmed in prospective studies, and interventions to improve the modifiable variables should be developed and evaluated.

6. Bod Davis et al.,(2000): wrote in their book that the concept of physical fitness, in general athletic terms, means the capability of the individual to meet the varied physical and psychological demands made by a sports activity, without reducing the person to an excessively fatigued state. Such a state would be one in which he/she can no longer perform the skills of the activity accurately and successfully.

7. Richard S. Strauss (2001). Understanding the determinants of physical activity in children is critical for the treatment and prevention of childhood obesity. Social- cognitive theory has been used to understand behavioral patterns in children.

METHODOLOGY

The investigator contacted coaches who gave the permission to take the data from the players about the injury rate. Each player gave verbal consent to participate in the present study. After getting consent, following information were collected: Name, age, sex, height, weight, BMI and other questions related to inclusion and exclusion criteria. Data was collected using Modified Nordic musculoskeletal questionnaire.

The present study was a cross sectional survey study with retrospective model, where athletes were asked to report injuries sustained in last one year. Total of 105 boxing players, 73 males and 32 females, were selected according to convenience of investigator. Main inclusion criteria were age between 13 to 28 years; both males and females; playing experience was at least one year; have a regular play and played in at least at the district level. Athletes with following characteristics were excluded from the present study: Use of steroids and other performance enhancing drugs; known hypertension, diabetes.

Source of data :

Common shoulders Injuries in boxers were included in the study taking into consideration the inclusion and exclusion criteria.

Inclusion and Exclusion Criteria:

Inclusion Criteria:

1. Study Duration 3 month
2. Acute cases
3. Terms shows and injury prevalence.
4. Age group 13-28
5. Male and female
6. At least 1 year experience

Exclusion Criteria:

1. Any Traumatic Injuries
2. Fracture
3. Doping
4. Chronic injuries

Questionnaire:

Modified Nordic musculoskeletal questionnaire contains one full body diagram in order to be understood by illiterate players. Injury information was collected as: Anatomical site of injury (Head, neck, shoulder and arm, elbow and forearm, wrist and hand, back, hip and thigh, knee and leg, ankle and foot) and type of injury (Sprain, strain, fracture, dislocation and other injuries); whether player contacted physician or physiotherapist for treatment.

Operational definition:

Injury was defined as "Any pain that prevents the player to stop playing/practicing, prevent them to practice or play games in subsequent days (at least 3 days); It may also lead the players to contact physician or physiotherapists for getting treatment for that pain".

Statistical Analysis:

All results were analyzed manually using MS Office 2011 (Microsoft excel) and were expressed as prevalence rate of injury, type of injury and role of players.

RESULT

This is retrospective type of survey in which total boxing players were 105 (males are 73, females are 32) participated. The sample anthropometric measurements are given in table 1.

Table 1: Anthropometric characteristic male of field hockey and cricket players.

Gender	Anthropometric character	Range (minimum-maximum)	Mean ± SD
	Age (in years)	13.0 to 31.0	16.26±3.13
Male	**Height (in cm)**	140.0 to 184.0	164.58±11.90
(n= 73)	**Weight (in Kg)**	38.0 to 89.5	56.05±9.93
	BMI	16.61 to 27.02	20.65±2.46

Table 2: Anthropometric characteristic female of field hockey and cricket players.

Gender	Anthropometric character	Range (minimum-maximum)	Mean ± SD
	Age (in years)	13.0 to 31.0	18.38±4.69
Female	**Height (in cm)**	152.0 to 176.0	159.81±7.24
(n = 32)	**Weight (in Kg)**	45.0 to 82.0	56.91±9.40
	BMI	16.79 to 34.15	22.47±4.62

Table 3: Site specific one year prevalence rate of injuries in field boxing (n=48)

Joints	Prevalence of 12 month injury	Consultation By physiotherapist Or physician
Head	2 (4.16%)	2(100%)
Neck	0 (0%)	0 (0%)
Shoulder	3 (6.25%)	3(100%)
Upper Back	0(0%)	(0%)
Elbow	3 (6.25%)	1 (33%)
Wrist / Hand	18 (37.5%)	10(55%)
Lower Back	6 (12.5%)	6 (100%)
Hips/ Thigh	2 (4.16%)	1 (50%)
Knee/ Leg	8 (16.66%)	4 (50%)
Ankle / Feet	6 (12.5%)	5 (83%)

Table 4: Prevalence of type of injury among boxing players (n=48)

Type of injury	**Number of player**
Sprain	19(40%)
Strain	25(52%)
Fracture / Dislocation	2(4%)
Other Injuries	2(4%)

Among different type of injury, strain is the most common (52%), followed by sprain (40%) as shown in table 3. Table 4 shows gender specific injury prevalence along with site specific injury prevalence rate. Males injured slightly higher than that of females. Lower limb injuries are more common in males and upper limb

injuries are more common in females. Wrist and shoulder injuries are more common in females. Back, ankle and knee injuries are more common in males.

Table 5: Gender specific, gender on site specific prevalence of injuries in boxing

Joints	Male (73)	Female (32)
Overall	34 (46.57%)	14 (43.75%)
Head	2 (5.88%)	0
Neck	0 (0%)	0
Shoulder	1 (2.94%)	2(14.28%)
Elbow	2 (5.88%)	1(7.14%)
Wrist	10(29.41%)	8(57.14%)
Back	5(14.70%)	1(7.14%)
Hip	2 (5.88%)	0

Knee	6(19.35%)	2(14.28%)
Ankle	6(19.35%)	0

Table 6: Gender difference in type of injury among boxing players

Type of Injury	Male (34)	Female (14)
Sprain	13(38.23%)	6(42.85%)
Strain	17(50%)	8(57.14%)
Fracture / dislocation	2(5.88%)	0
Others	2(5.88%)	0

DISCUSSION

The primary objective of the present study was to see the overall, site specific and type of injury specific prevalence of musculoskeletal injuries during training in boxing players. The results showed overall prevalence is 46%. Wrist and hand is most common site (37.5%), followed by knee and leg (16.7%), ankle and foot (12.5%) in boxing training. Strain accounted for more than 50% of total injuries, followed by sprain (40%).

Secondary objective of the present study was to see gender difference in overall, site specific, type of injury specific prevalence of musculoskeletal injuries in boxing. In boxing, prevalence of injuries in males is marginally higher than females (46.6% vs 43.8% for males and females respectively) with back (14.7 vs 7.1%) and ankle (19.4% vs 0.0%) injuries are more common in males whereas wrist (29.4% vs 57.1%) and shoulder (2.9% vs 14.3%) injuries are more common in females boxing players. According to type of injury, strain and sprain are two most common problems in both males and females. There is no female player reported fracture/dislocation or other injuries; whereas, 2 cases for each reported by males.

Upper limb injuries (50%) are more common area in our present study. This finding is supported by **Loosemore et al., 2015;** Purcell and LeBlanc, 2012; **Oke et al., 2012;** Pappas, 2007; **Zazryn et al., 2006; Porter and O'Brien, 1996;** Jordan et al., 1990; **Welch, 1986**. Bolder references are similar to present study results. 33% of lower limb injury in the present study is supported by Porter and O"Brien, 1996.

According to site specific injuries, present study results are in accordance to Loosemore et al., 2015; Jordan et al., 1990. There are 4.2% of head injuries in the present study; this is supported by Loosemore et al., 2015. More than 90% of total injuries in present study are either sprain or strain. Literature shows 40 -60% of sprain and strain in boxing players during training period (Oke et al., 2012; Zazryn et al., 2006; Tim et al., 1993). 4% of total injuries are fracture or dislocation in our study is supported by Siewe et al., 2015; Oke et al., 2012; Tim et al., 1993.

Most of the literature reported more incidences of head injuries especially concussion type injury in boxing players. The reason for this may be more competitive level, age, sample size and characteristics, diagnosis criteria in those studies as against safety environment received by present study sample. Minor concussions in the present study might have ignored by players, coaches during the data collection as in the present study injury acquired during training period and not at the competition period. This might have resulted in discrepancy seen in present study as compared to other literature used.

Present study has some limitations such as it lacks methodological rigor- it used convenient sampling technique where investigator selected sample according to his ease of data collection. Males, females ratio is skewed (2.5:1). Sample heterogeneity- Age, level of play, experience in training are not standardized leading to data contamination. Retrospective study like this has „recall bias"- where subject may forget minor but significant injuries. Musculoskeletal injuries were assessed at the end of year and therapist might have misdiagnosed and misclassified the type of injuries.

CONCLUSION

Within the limitations, the present study can be concluded with following points: Nearly half of the boxers reported at least one injury during training in a calendar year. Wrist/hand, knee/leg and ankle/foot are the most common sites of injury in boxing.

Understanding the epidemiology of this sport is important so that preventive strategies can be developed in the forms of protective equipment, conditioning and change in rules. The results of present study may also help the trainers and physiotherapists to decrease the incidences of injuries through proper conditioning program.

The findings from the review provide evidence on the prevalence and severity of shoulders injuries. A wide range of prevalence rates of affecting different body regions have been reported, with the highest shoulder Wrist/hand, knee/leg and ankle/foot prevalence found in the regions.

Boxers in the pre-season had normal ratios on the rotators of shoulders but were at injury risk at the UL ratios. This observation highlighted the importance of these muscles for training and performance, with the reduction of deficit arises of the neuromuscular adaptations of strength training and the importance of the evaluation of asymmetries in athletes as according to the motor each sport templates which is an adaptive necessity for better performance and the prevention of injury

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