

ONE YEAR PREVALENCE OF MUSCULOSKELETAL DISORDER AMONG FIELD HOCKEY PLAYERS IN HARYANA: A RETROSPECTIVE STUDY

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ABSTRACT

This study was carried out to find out overall, site specific, role of play specific, gender specific, level of play specific and type of injury specific prevalence rate of musculoskeletal injuries in field hockey players. To work on this a cross sectional survey study was designed. The sample of the study was 111 players (43 males and 68 females) with at least participation at district level. Injury data was collected from each player using modified Nordic Musculoskeletal Injury Questionnaire. Data was entered into MS Excel for further analysis. The finding showed that 42 players out of 111 was injured leading to 38% overall prevalence of injuries among field hockey players. Out of 42 injuries, knee (24%), ankle (19%) and low back (17%) are the first three most common injuries in field hockey players. Forward (40%) and midfielder (39%) sustained maximum injuries among different playing role. Strain (40%) and sprain (31%) are the most common type of injury in field hockey. Male players (61%) injured more than female players (38.9%). National level players had maximum injury prevalence of 59.52%. State level players show injury prevalence of 28.5% and district level players injured at the rate of 11.9%. Prevalence of musculoskeletal injuries is high among field hockey players. Conditioning by coaches and early rehabilitation by physiotherapists are essential to reduce the injury rate.

Keywords: Sprain, strain, injury rate, midfielder, forward, defender.

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1. INTRODUCTION

Field hockey is played by men and women at recreational as well as at competitive levels, in 132 countries. Field hockey is the second most popular team sport after soccer. India dominated the field hockey world upto 1960's, till then it has won all the Olympic gold medal and champion of world cups. There after it is dominated by Germany, Holland and Australia. After 1960's the enthusiasm for field hockey in India was taken over by cricket. However, it is still popular in northern India, especially in Punjab and Haryana. Currently Haryana is dominating in both males and females hockey, which is evident from their success in All India tournaments from 2011 onwards. In 35th National games 2015, Haryana has won the silver medal in women category and bronze medal in men category. In 5th Junior National championship 2015, it has won gold medal in women category (Hockey Haryana Achievement, 2015).

These achievements are possible because high number of young people is participating in field hockey from Haryana. But this has also leads to more musculoskeletal injuries in field hockey. Injuries are inevitable when one player is training and competing. There are numerous studies available at international level, but there is a lack of studies in India in field hockey. This is especially true in small state like Haryana where enthusiasm for sports participation is high but scientific monitoring of injuries either by coach/trainer or by physiotherapist/physician is low. Thus the objective of present study was to see prevalence of musculoskeletal injuries, site specific, type and injuries according to role of play in field hockey. Prevalence studies are important because it will identify the site and type of injury amongst the players. This will help the coaches and physiotherapists to train the athlete accordingly. Prevalence studies also help to modify the rules and include the protective equipments in order to minimize the injury risk.

2. METHODS AND MATERIALS

2.1 Study Design

Present study was a cross sectional survey study with retrospective model. Inclusion criteria for the current study was: Age between 13 years and 28 years, both males and females, playing experience was at least one year, have a regular player and played in at least at the club level. Players with characters such as use of steroids and other performance enhancing drugs, known hypertension, diabetes were excluded.

2.2 Sample

A total of 111 field hockey players (males 43 and females 68) were selected after inclusion and exclusion criteria; gave their verbal consent to participate in the study. They were selected from four locations namely SAI Giri Center, Hisar; Rajiv Gandhi Khel Stadium, Umra; Government Secondary School, Kamiri; Hockey Ground, Dabra. Their anthropometric characters of age, height, weight and BMI were 16.81 ± 2.63 yrs, 173.28 ± 4.85 cm, 60.84 ± 7.11 Kg, 20.28 ± 2.32 Kg.m⁻² respectively for males, and 15.40 ± 2.17 yrs, 158.69 ± 5.44 cm, 49.49 ± 5.99 Kg, 19.62 ± 1.81 Kg.m⁻² respectively for females.

2.3 Instruments

Modified Nordic musculoskeletal questionnaire developed by Crawford, (2007) 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 category of injury (Sprain, strain, fracture, dislocation and other injuries); whether player contacted physician or physiotherapist for treatment; and on the basis of role of play in field hockey like forward, defender, midfielder and goal keeper.

2.4 Procedure of Data Collection

The investigator contacted coaches who gave the permission to take the data from the players about the injury rate. Data was collected using Modified Nordic musculoskeletal questionnaire. Data was collected between May and June 2015. Players were asked to recall the injuries they sustained in last one year i.e May 2014 to April 2015.

2.5 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.

3. RESULTS

The injured hockey players were 42 (one year prevalence rate is 38%). The injury prevalence rate according to the modified Nordic musculoskeletal questionnaire in which shows the 12 month site specific prevalence of injury; their consultation

by physiotherapist or physician. Table 1 shows the above facts in field hockey players along with prevalence rate.

Table 1: Site specific one year prevalence rate of injuries in field hockey players (n=42)

Joints	Prevalence of 12 Month Injury	Consultation by Physiotherapist or Physician*
Head	5 (12%)	3 (60%)
Neck	1 (2%)	1 (100%)
Shoulder	1 (2%)	1 (100%)
Upper Back	2 (5%)	1 (50%)
Elbow	1 (2%)	1 (100%)
Wrist/Hand	5 (12%)	4 (80%)
Lower Back	7 (17%)	7 (100%)
Hips/Thigh	2 (5%)	1 (50%)
Knee	10 (24%)	7 (70%)
Ankle/Feet	8 (19%)	5 (62%)

*% is from site specific total injuries with consultation

In field hockey, the lower limb injuries were most common (48%), followed by trunk (24%) and upper limb injuries (16%). Knee was most common (24%) site of injury followed by ankle and foot injuries (19%) and third most common site was lower back (17%). These results show in table 1.

Table 2: One year prevalence rate of injuries according to player's role in field hockey (n=111)

Role of Players	Total Players	Injured Players
Goalkeeper	6	2 (33%)
Forward	43	17 (40%)
Defender	34	12 (35%)
Midfielder	28	11 (39%)

Table 2 shows distribution of player's injury according to the role of players. The most commonly injured were midfielder and forward have equal rate of injury incidence, followed by the defender and goalkeeper. The difference between different playing positions was less than 10%.

Sprain and strain were the most common type of injuries accounted 71% than other type of injuries. These data shows in Table 3.

Table 3: Type of injury among field hockey player (n=42)

Type of injury	Number of player
Sprain	13(31%)
Strain	17(40%)
Fracture/Dislocation	4(10%)
Other Injuries	8(19%)

Table 4: Gender difference in site specific injuries among field hockey (n=111)

Joints	Male (n=43)	Female (n=68)
Injured total (%)	26 (61.1)	16 (38.9)
Head*	4 (15.38)	1 (6.25)
Neck*	1 (3.85)	0
Shoulder*	1 (3.85)	0
Elbow*	1 (3.85)	0
Wrist*	2 (7.69)	3 (18.75)
Back*	5 (19.23)	4 (25.0)
Hip*	2 (7.69)	0
Knee*	6 (23.07)	4 (25.0)
Ankle*	4 (15.38)	4 (25.0)

*injury n (% out of injured total gender specific)

Table 4 shows gender specific injury prevalence in field hockey players along with site specific difference. Male players were injured more than the female players (61.1% & 38.9% respectively). Knee injuries were the most common injury in both males and females however back injury was the second most common in males whereas back and ankle were equally injured as of knee in females. Ankle and head injuries were third most common injury in males.

Table 5: Prevalence of injury according to level of play in field hockey (n=111)

Level	Total	Injured	%
District	23	5	11.9
State	37	12	28.5
National	51	25	59.52

Table 5 shows prevalence of injury according to level of play in field hockey. 50% of the total population was national level players with maximum injury

prevalence of 59.52%. State level players showed injury prevalence of 28.5% and district level players injured at the rate of 11.9%. The reason for more injuries in national level players may be due to intensity of the play (high speed with multi direction movement), volume of training, frequency of training, more games played in a session, less rest between the training sessions and competition.

4. DISCUSSION

The primary objective of this study was to locate the one year prevalence of musculoskeletal injuries amongst field hockey players belonging to Haryana state. The results showed prevalence in field hockey players with 2/5th of the people get at least one injury in a year.

Secondary objective of present study was to see site specific, role specific prevalence of rate of musculoskeletal injuries in field hockey players. Knee, ankle and low back are the first three most common injuries in field hockey players. Forwards and midfielders get equal prevalence of injuries in field hockey players. Strain and sprain are the top two type of injury among field hockey players.

These results are not surprising that field hockey involves running with semi crouch position for longer period of time leading to higher lower limb injuries (48%). This is supported by lots of contemporary researchers (Rose, 1981; Lindgren, & Maguire, 1985; Fuller, 1990; Freke, & Dalgleish, 1994; Powell, & Barber- Foss, 1999; Murtaugh, 2001; Junge, Langevoort, G., Pipe, A., Peytavin, A., Wong, F., Mountjoy, M., ... & Dvorak, 2006; Dick, Hootman, & Agel, 2007; Ellapen, Abrahams, Farzanah, Desai, & van Heerden, 2011; Sharma, Seth & Koley, 2012; Ellapen, Bowyer & van Heerden, 2014; Sreekaarini, Eapen, & Zulfeequer, 2014). The bolder references are similar to the present study prevalence rate. The other factors that contribute to high lower limb injuries are uneven surfaces, fouls made by opponent (pushing, falling and sudden swipe rotational movements). Crouch position also leads to weaker back muscle that leads to low back injuries (17%). This is supported by Lindgren and Maguire, (1985), Freke and Dalgleish, (1994), Dick, Hootman and Agel, (2007); Ellapen, et al., (2011), Ellapen, Bowyer and van Heerden, (2014). Being a missile contact sports playing field hockey causes more head injuries (12%). This is supported by Rose, (1981), Fuller, (1990), Powell and Barber-Foss, (1999). Sharma, Seth and Koley (2012) reported that the second most frequent site of injury in field hockey was head and trunk (31.74%). The vigorous use of hockey stick for handling the ball increases the potential risk of injury and falling on the surface is one of the factors that lead to injuries.

Knee is the most common site of injury (24%) followed by ankle (19%) in Field hockey which is supported by lots of researchers (Jamison & Lee, 1989; Ellapen, *et al.*, 2011; Ellapen, Bowyer & van Heerden, 2014). Ellapen, Bowyer

and van Heerden (2014) reported that players who sustained acute knee injuries cited rapid rotational movement and physical trauma to be the predisposing mechanisms of injury. The rapid rotational movement increases the risk of medial collateral ligament and anterior cruciate ligaments sprains, which destabilize the knee joint. Dick, Hootman and Agel (2007) reported that physical trauma from being struck with the ball and/or stick on the tibia and/ or fibula produces varus and valgus forces which contribute to knee instability, propagating severe ligamentous knee injury. Sharma, Seth and Koley (2012) reported ankle sprain was the most common injury in the lower limb (i.e.13.49%). Ankle sprain in hockey is likely to occur due to improper footwear which causes inversion and plantar flexion. Naicker, Mclean, Esterhuizen & Peters-Futre (2007) postulated that rapid rotational movements when playing hockey move the ankle into plantar flexion and inversion, which exceed the plastic properties of the lateral ligaments, thereby producing tearing. Ellapen, Bowyer and van Heerden (2014) reported that the medial ligament restraints have proven to be more effectively resistant than the lateral ligaments, yielding fewer reports of eversion ankle sprains than inversion sprains.

Among the different roles, forwards (40.4%) received maximum injuries followed by defender (28.5%) and Midfielder (26.1%). This result is exactly reproduction of Sharma, Seth & Koley, 2012. Fuller, 1990 reported that forward and midfield positions each accounted for 37% of injuries.

Strain is the most common type of injury (40%) followed by sprain (31%). Freke and Dagleish, (1994) reported 32% of strain in field hockey. 31% of strain injuries in field hockey is supported by Powell and Barber-Foss, (1999) (25.5%); Murtaugh, (2001) (39.7%).

Yard and Comstock, (2006) reported higher upper limb injuries in male than females (OR 2.3 with 95% CI 1.10-4.84). They are also reported lower limb injuries in females than males in field hockey. These finding are supported by our present study. Sherker and Cassell, (2002) also reported higher male injury in field hockey according to data available in Victoria emergency medical department. The reasons for higher prevalence of injuries in males may be due to intensity of training in terms of speed, volume and other psychological factors such as aggression, motivation, need/desire to win etc. Mukherjee, (2012) reported that all field hockey sticks are constructed to be held with the left hand on the top and right hand variably positioned at a lower position on the stick. The left hand forms the anchor grip, while the right hand serves as the manipulative grip. This exposes the dorsum of the left wrist and hand over the stick while these parts are behind the shaft on the right side. Moreover, in the event of a perceived injury risk, the right hand, although closer to the ground, is taken off the stick more frequently as a reflex reaction while the left hand continues to hold the stick,

making it relatively fixed and more vulnerable to injury by the ball or the opponent's stick.

There are certain limitations observed in the present study, they are: Present study lacks methodological rigor- it used convenient sampling technique where investigator selected sample according to his ease of data collection. 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 classify the type of injury wrongly.

5. CONCLUSIONS

The results of the present study can be concluded as- prevalence of musculoskeletal injuries is about 38% in field hockey. Lower limb is the most prevalent injured body segment. Knee, ankle followed by low back are the most common injured sites in field hockey. On the basis of position in playing- Forwards and midfielders got equal prevalence of injuries. Strain and sprain are the commonest type of injury among field hockey players & on the basis of gender, males are injured more as compared to the females.

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