

Role of Physiotherapist in the Management of on Ground Sport Injuries: A Case Study of Hockey

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ABSTRACT

Study design: Prospective cohort study of Indian women field hockey players. **Background:** Ground sport injury is a challenging task for physiotherapists around the world and lack of literature data makes it more difficult. In India it is still in the growing phase. This first case study provides the basic baseline data regarding potential areas of injury, their types, treatments, and outcome of the treatment on subjects and on game results. **Case description:** This study covers 16 Indian women field hockey players who participated in 15th Asian Games held at Doha from 1st Dec to 15 Dec, 2006 where they played a total of matches, each of 70 minutes. **Outcomes:** Throughout the tournament, 39.3% total players got injured: atleast three body parts were affected by seven different types of injuries and rehabilitated according to symptoms by using physical therapy which is cost effective. Occurrence of muscle related injury was the highest (35%) and cut injury on head and eye were the least (2%). Forwards were at highest risk (43%) while goal keeper at least risk (0%). The effect of treatment was 100% and recovery time ranged from 5 min to 35 mins. Out of 22 total goals scored, forwards scored the maximum (19 goals-86%) followed by midfielder (2 goals-9%) and defender (1 goal-5%). The fact that after rehabilitation, injured players scored significantly ($p < 0.01$) more goals (68%) than the non-injured (32%), shows physiotherapy enhanced the game performance. **Discussion:** Musc related injuries which were found most were probably due to running or less flexibility in the muscles. Forwards being affected the most may have been due to their quick responses and chasing the ball at both he end goals.

Key words: Field hockey, sports injury, physiotherapy, rehabilitation

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INTRODUCTION

Physiotherapy in sports is now an integral part of many sports around the world. Management of ground injuries is a challenging task for many physiotherapists and lack of literature data makes it more difficult. In India it is still in the growing phase.

Sports physiotherapy is a well recognized profession that demonstrates advanced competencies in the promotion of safe physical activity participation, provision of advice and adaptation of rehabilitation and training intervention for the purposes of preventing injury, restoring optimal function, and contributing to the enhancement of sports performance in athletes of all ages and abilities, while ensuring a high standard of professional and ethical practice [1]. Sports physiotherapy is a combination of manual and therapies that use a number of different techniques, including manipulation and mobilization, massage, hydrotherapy, exercise programmes, electrotherapy (ultrasound and interferential therapy), and some cases rest. Physiotherapists not only treat the problem but are often able to show the patient how to help prevent the problem happening again. The purpose of physiotherapy is to decrease body dysfunctions, reduce pain caused either by trauma, inflammation, degeneration, and surgery.

Sports medicine, sports physiotherapy and nutrition are newer fields, yet to be utilized to

their optimum potential. During the recent past, sports have now become very competitive and much of the scientific research and support towards sports teams is found to be rewarding:- team doctors, team sports physio services have become very essential for most of the teams, health, SPA (sports physiotherapy for all) and health gymnasiums.

Hockey is an ancient sport thought to be the forerunner of all 'stick and ball' games, played in most of the countries around the world. It is a game of strength, speed, and skill. It is among the most difficult to master, the costliest to equip, the fastest to watch, and the most dangerous to play. It requires a combination of power, endurance, and flexibility. It is a game of control and lack of control, both of emotions and flying objects.

Epidemiological studies have consistently shown that injuries in hockey are numerous and can be serious. Most serious injuries result from being struck by the stick or the ball. Overuse injuries to the ankles and lower back are a frequently occurrence [4,5]. Most injuries presenting to hospitals are to the upper limb (mostly injuries to the hand and forearm), face (mostly struck by stick or ball), and lower limb (mostly ankle, foot, and knee injuries). Injuries to the eyes are infrequent,

Table 1. Player's characteristics who participated in 15th Asian games held at Doha, 2006

Player no/ Jersey no	Age (yrs)	Height (m)	Weight (kg)	Position of play	International Match played (no)	Tournament goal scored (no)
1	26	1.57	60	goal keeper	71	0
3	25	1.65	59	defender	62	0
4	27	1.66	57	mid fielder	38	0
5	21	1.64	58	mid fielder	36	1
8	16	1.58	61	forward	7	0
9	24	1.54	49	forward	94	8
10	25	1.60	48	forward	86	2
12	23	1.64	57	goal keeper	13	0
13	18	1.68	59	defender	13	0
14	15	1.56	50	forward	8	0
18	19	1.64	58	forward	52	1
20	28	1.53	46	forward	172	5
23	25	1.57	52	defender	78	0
24	21	1.57	50	forward	51	3
25	26	1.56	51	defender	36	1
30	20	1.55	51	mid fielder	66	1

Table 2. Date wise on ground injuries, their types, treatments and outcome of the treatments

Date	Number	Type	Treatment	Outcome
03	6	Knee pain (1) Ankle pain (1) Muscle pain (3) Low back pain (1)	Taping, Ultrasound Ice, Crape bandage Taping Taping, DMST, TENS	Improved, Fit to play Improved, Fit to play Improved, Fit to play Improved, Fit to play
05	6	Knee pain (1) Ankle pain (1) Thigh muscle pain (2) Cut injury at eye (1) Low back pain (1)	Taping, Ultrasound Ice, Crape bandage Taping, Stitching, antibiotics, analgesic Taping, DMST, TENS,	Improved, Fit to play Improved, Fit to play Improved, Fit to play Improved, Fit to play Improved, Fit to play
06	7	Knee pain (1) Ankle pain (1) Thigh muscle pain (3) Low back pain (1) + Cut injury at head (1)	Taping, Ultrasound Ice, Crape bandage Taping Taping, DMST, TENS, Antibiotics, analgesic	Improved, Fit to play Improved, Fit to play Improved, Fit to play Improved, Fit to play Improved, Fit to play
08	7	Knee pain (1) Ankle pain (1) Thigh muscle pain (3) Low back pain (1) Wrist injury (1)	Taping, Ultrasound Ice, Crape bandage Taping Taping, DMST, TENS Taping	Improved, Fit to play Improved, Fit to play Improved, Fit to play Improved, Fit to play Improved, Fit to play
09	7	Knee pain (1) Ankle pain (2) Thigh muscle pain (2) Low back pain (1) Wrist injury (1)	Taping, Ultrasound Ice, Crape bandage Taping Taping, DMST, TENS Taping	Improved, Fit to play Improved, Fit to play Improved, Fit to play Improved, Fit to play Improved, Fit to play
11	6	Knee pain (1) Ankle pain (1) Thigh muscle pain (2) Low back pain (1) Wrist injury (1)	Taping, Ultrasound Ice, Crape bandage Taping Taping, DMST, TENS Taping	Improved, Fit to play Improved, Fit to play Improved, Fit to play Improved, Fit to play Improved, Fit to play
13	6	Knee pain (1) Ankle pain (2) Thigh muscle pain (1) Low back pain (1) Wrist injury (1) Low back pain (1) Wrist injury (1)	Taping, Ultrasound Ice, Crape bandage Taping Taping, DMST, TENS Taping Taping, DMST, TENS Taping	Improved, Fit to play Improved, Fit to play Improved, Fit to play Improved, Fit to play Improved, Fit to play Improved, Fit to play Improved, Fit to play

Table 3. Player wise each day injuries and game results

Date	P1	P3	P4	P5	P8	P9	P10	P12	P13	P14	P18	P20	P23	P24	P25	P30	Result
3	0	0	0	1	0	1	1	0	1	0	0	1	0	0	0	1	1
5	0	0	0	1	0	1	1	0	1	0	0	1	0	0	0	1	0
6	0	0	0	1	0	1	1	0	1	0	0	1	0	0	0	1	1
8	0	0	0	1	0	1	1	0	1	0	0	1	1	0	0	1	1
9	0	0	0	1	0	1	0	0	1	0	1	1	1	0	0	1	0
11	0	0	0	1	0	1	0	0	1	0	0	1	1	0	0	1	0
13	0	0	0	1	0	1	0	0	1	0	0	1	1	0	0	1	1

0- not injured/loss, 1-injured/win

although tend to be severe [14].

In literature, most of the studies describe single case reports with specific injury and its treatment and do not cover group injuries (team), especially ground injuries during a game [15,16,17]. For the first time, this case study was aimed to explore ground injuries related to hockey and the outcome of treatments. Beside this, the effect of treatment on game results was also observed. Basic data of this case study may be helpful for other physiotherapists.

CASE DESCRIPTION

This case study [13] was done on 16 Indian women hockey players who participated in the 15th Asian Games held at Doha from 1st Dec to 15 Dec, 2006. Each player's characteristics are presented in Table 1. As this case study is about ground injuries during the game, the details of the injury its treatment and outcome of the treatment are summarized in Table 2; date wise individual injury and game results in Table 3. The players age, height and weight ranged from 15-18 yrs, 1.53-1.68 m and 46-61 kg respectively with an average 22.44 yrs, 1.60 m and 54.13 kg respectively. Similarly, numbers of matches played (international) and goals scored in this tournament ranged from 7-162 and 0-8 respectively with an average 55.19 and 1.31 respectively. 16 of the players, 2 were goal keepers, 3 midfielders, 7 forwards, and

5 defenders among these, 5 were reserved (inter-changeable) players (P4, P8, P12, P13 and P14).

The physiotherapist joined 15 days before the tournament in India. In his first screening, five players (P5, P9, P13, P20 and P3) had chronic injuries (low back pain, knee pain, ankle injury and thumb injury) even though they were fit in their daily activities, including play. According to symptoms, they were rehabilitated before the tournament. These players also joined general physiotherapy rehabilitation programme with others while their stay in India. None of the participants had had a systematic intensive course of physiotherapy before. During the game at Doha, individual injury and type of injury was recorded by the physiotherapist. A player who suffered multiple injuries of the same kind was counted as 1. The injured player was rehabilitated on the ground and off the ground. This study did not require any patient consent.

OUTCOMES

During their stay at Doha, the players played seven matches, each of 70 minutes. In the seven matches, India scored a total of 22 goals, won in four along with a bronze medal. Out of 112 (16 players X 7 games), total 44 players (39.3%) got injured. During the tournament, a total of seven types of injuries occurred which were low back injury (pain), ankle

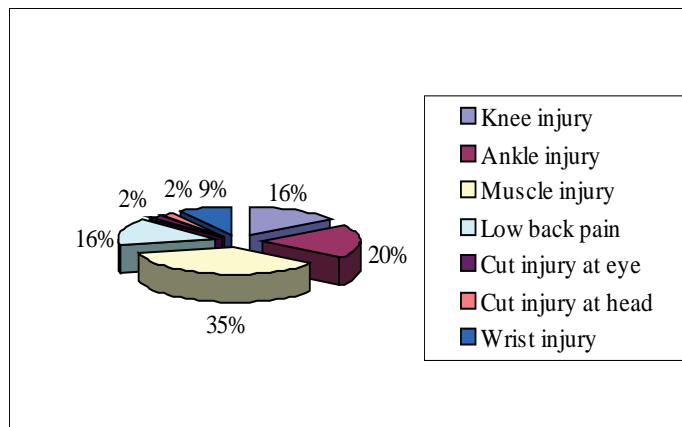


Fig. 1. Area wise distribution of injuries (%).

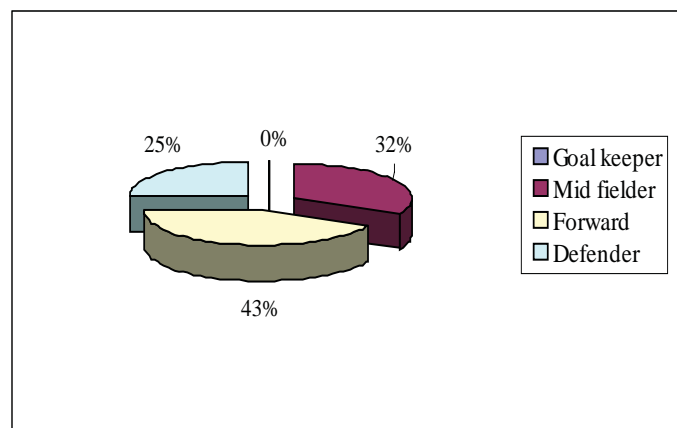


Fig. 2. Position wise distribution of injuries (%) during the game.

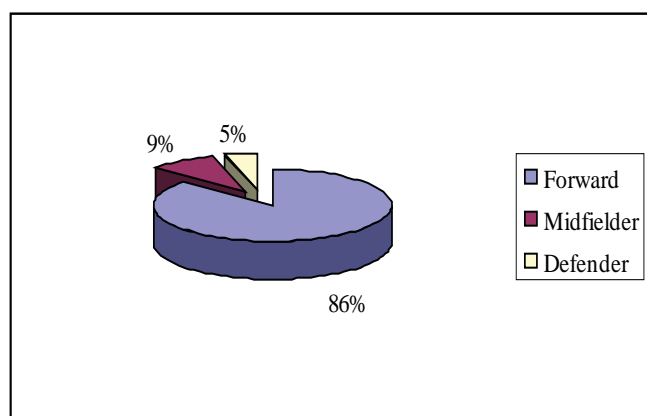


Fig. 3. Position wise distribution of goal scored.

injury, knee injury, wrist injury, muscle injury, and hit and cut injury at the head and corner of eye. Eight players did not get injured throughout the tournament. Only one player (P20) had multiple injuries (low back pain and cut injury at head) during

the third match. Most of the injuries occurred when the player was near the goal or within the 25-yd line and were caused by contact with stick or ball, or with players, or chasing the ball; head and eye injuries were caused when penalty was called.

Except hit injuries, the rehabilitation of other injuries was done by the physiotherapist. According to symptoms, treatments were instituted, such as taping, mobilization, manipulation, dynamic muscular stabilization technique (DMST), cold therapy, ultrasound, TENS, stretching exercises and relaxation exercises, crape bandage and strengthening exercises. Except for ultrasound, TENS and relaxation exercises, other treatments were given on the ground during the game. In all the interventions rate of recovery was 100% and the time of recovery was from 5 minutes to 35 minutes.

Area-wise distribution of injuries (Fig. 1) shows that the occurrence of muscle (thigh and calf) related injury was the highest (35.6%) and hit and cut injury at head and eye was the least (2.2%). Ankle injury was the second highest (20.0%) followed by low back pain, knee injury (15.6%) and wrist injury (8.9%). Similarly, position wise distribution of injuries (Fig. 2) show that forwards were the highest at risk (31.8%) while goal keepers the least (0%). Midfielders were second highest at risk (31.8%) followed by defenders (25%).

Out of 22 total scored goals, forwards scored the maximum (19 goals-86.4%) followed by midfielders (2 goals-9.1%) and defenders (1 goal-4.5%) (Fig. 3). Comparing goals scored between the non-injured and injured players, the ratio of goals scored by injured players [17] was significantly high ($p < 0.01$) than the non-injured [5]. Interestingly, out of 22 total scored goals, five players (31.3%) who were injured before the tournament and remained with their injury throughout the tournament scored 15 goals (68.2%) thereby proving that physiotherapy

not only rehabilitated their injury and improved their playing skills and power, but also enhanced mental, physical strength, and game performance.

DISCUSSION

Case research plays an important role in gathering evidence for more efficient practice, especially in relation to physiotherapy, where it is common to find interventions that are context-dependent and multifaceted [2]. Exercise therapy is generally prescribed to be a specialist clinical skill and the most complex and difficult part of physiotherapy [7]. This case report describes the rapid recovery of an athlete in case of ground injury and her achievement and satisfaction with the outcome after physiotherapy intervention. It has been suggested that physiotherapist should, at the initial examination, identify the patient's goals and objectives in order to maximize outcomes of physiotherapy intervention. Core aspects of physiotherapy management in ground injuries are reduction in pain, improvement in function, and prevention of further deterioration.

All the physiotherapeutic interventions (taping, mobilization, manipulation, dynamic muscular stabilization technique (DMST), cold therapy, ultrasound, TENS, stretching exercises and relaxation exercises, crape bandage and strengthening exercises) provided during the tournament are well documented [6,8,9,10,11]. and practitioners use these in their daily treatments. These treatments may block pain pathways, mobilize bound neurological structures or enhance the musculoskeletal efficiency [12].

In this case study, 39.3% total players got injured. Three body parts were affected by seven different types of injuries and rehabilitated according to symptoms. Occurrence of muscle-related injury was the highest (35%) and cut injury at head and eye the least (2%). Forwards were at highest risk (43%) while

goal keepers the least were at risk (0%). The effect of treatment was 100% and recovery time ranged from 5 minutes to 35 minutes. After rehabilitation, injured players scored significantly ($p < 0.01$) more goals (68%) than the not injured (32%), which shows physiotherapy enhanced the game performance. Musc related injuries which were found most may have been due to running or less flexibility in the muscles. Forwards affected most may have been due to their quick responses and chasing the ball at both the end goals.

This case study strongly recommends that all hockey players should undergo at least a pre-season fitness screening for general strength, flexibility, and endurance. Coaches should be trained to screen players and to refer them to appropriate professionals if problems are evident. Equipment (requiring helmets and padded gloves) and rule changes (to decrease field congestion near the goal) as well as evidence-based injury prevention interventions (prophylactic ankle taping/bracing, neuromuscular balance exercise programs) may be viable prevention initiatives for reducing injury rates in women as well as men field hockey players [18].

The objective of a physiotherapist while rehabilitating the ground injured sports person is "to make a player fit for play within the shortest possible time". In this study it varied from 5 minutes to 35 minutes. The other possible physiotherapeutic interventions with optimal time may be highly imperative. The basic baseline data of this case study may be beneficial in future to other physiotherapists.

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