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Research Article

Causes and Management of Hamstring Strain of Athletes in Bangladesh Krira Shikkha Protishthan

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Abstract

The purpose of the study was to find out the physiotherapy management of hamstring strain among the athletes of Bangladesh. A mixed method followed to conduct this study. Data were collected from the Bangladesh Krira Shikkha Protishtan (BKSP). Among the different types of injury the athletes of BKSP, about 10.49% athletes were suffered with hamstring injury. Among them, more common athletes were from Hockey (14.58%); Football (11.34%) and Cricket (3.85%) sports. Rehabilitation program consisting with length of type of exercises is more effective than a conventional protocol in promoting return to sports after acute hamstring injury. A similar hamstring strength, similar flexibility or range of motion, athlete should be certified as medically fit before returning to play, and other criteria as 80% isotonic knee flexion strength as compared with the normal opposite leg, no pain when sprinting, and having progressed through a sport-specific rehabilitation program. The management of hamstring strain depends on healing process of muscle strain. In addition, initiation of Nordic hamstring exercises may decrease the incidence of acute hamstring injuries and potentially decrease the total number of days missed due to injury in professional baseball players.

Keywords: *Athletes; Physiotherapy Management; Hamstring Strain*

Abbreviations

BHPI: Bangladesh Health Professions Institute (BHPI); BKSP: Bangladesh Krira Shikkha Protishtan; CRP: Centre for the Rehabilitation of the Paralysed (CRP)

Introduction

Hamstring muscle strain is one of the most common injuries of lower extremity for athlete [1]. With regard to the severity of symptoms there are three grades of hamstring muscle strain such as grade I, II, III. In grade I few muscle fibers are torn and refer to a mild strain while grade II associated with a greater number of injured fibers are called moderate injury. Both Grade I and II muscle strains include pain and tenderness upon pressure, local swelling, muscle spasm and a decrease in the range of motion, during passive stretching or contraction of the muscle Pain becomes stronger, but Grade III strain is a complete tear of the muscle causing absolute loss of muscle function,

as well as considerable pain, swelling, tenderness and ecchymosis [2]. Hamstring muscle strain injury is one of the most common injuries in track and field, soccer, Australian football, rugby, and American football involving high-speed running, jumping, and kicking, accounting for between 6% and 29% of all injuries in these sports [3].

There are two risk factors that predispose the injury that are modifiable and non-modifiable factors [4]. Modifiable factors includes - shortened optimum muscle length, lack of muscle flexibility, strength imbalance, insufficient warm-up, fatigue, low back injury, increased muscle neural tension and non -factors includes - muscle compositions, age, race, previous injuries [5]. The main extrinsic factor constitutes the physical contact between opponent players [6]. The major source of intrinsic factor of hamstring injury are asymmetries in muscle strength, flexibility, and proprioception another cause as well as joint instability, anatomical and anthropometric asymmetries [7].

Hamstring injuries are the most common single type of injury representing 12-37% of all injuries [8]. During matches more than half of injury occurs in muscle injuries (53%) and 47% during training [9]. There are ninety-two percent of all muscle injuries affected the 4 major muscle groups of the lower limbs - hamstrings (37%), adductors (23%), quadriceps (19%), and calf muscles (13%) and Sixteen percent of the muscle injuries were re-injuries [9]. The risk of muscle incidence is six times higher during match play (8.70 vs 1.37/1000 hours) compared to training and 66% of all hamstring injuries occur during matches [8]. British Athletics reported 65 hamstring injuries in out of 230 athletes. This consisted of 31 sprinters, 8 vertical/horizontal jumpers, 3 middle distance athletes, 1 thrower and 1 endurance runner [10]. In Bangladesh BKSP among the injury of the total body part the hamstring injury were 10.49 percentages, and were more common in Athletics (28.57%), Hockey (14.58%), Football (11.34%) and Cricket (3.85%) [11].

Most commonly hamstring strain occur during the final event because in this time load increase [9]. Grade I and grade II injury occur most commonly. Initial management of hamstring injury PRICE protocol and if the injury occur grade l ice used 20 minutes 3 times a day but in case of grade II ice used 20 minutes 2 hourly and this treatment maintain for 3 days rest from sports for 15 days and continue physiotherapy massage, stretching. Then return to sports after 1 month [11].

There have intrinsic and extrinsic fact of that lead to injury. Recurrence of hamstring injury is more common and it's a risk factor of hamstring injury. In BKSP initial management of hamstring injury was follow PRICE protocol and use ice 20 minutes every two hourly if injury in acute stage. However, to gain in-depth information about the causes and current management of hamstring strains, this study conducted among the athletes of BKSP.

Materials and Methods

Study design

The study conducted through mixed of retrospective and qualitative study design. The retrospective data were collected through the official documents of BKSP. In addition, the qualitative data were collected with face to face interview. The researcher collected data from the ten athletes of a numerous playing field including high jumper, long jumper, 100 meter runner, 300 meter runner. The data were collected from the BKSP.A convenient sampling procedure followed for this study.

Inclusion criteria

- Athlete's age ranged 15 - 22.
- Both male and female athletes.
- Hamstring strain only.
- Willing to participate.

Exclusion criteria:

- Athletes with more than 22 years old.

- Those respondents who were not athletes.
- Those athletes who were not willing to participate.

An in-depth face to face interview was conducted among the respondents throughout a semi-structured open ended questionnaire. All of them were asked, regarding their practice, play, injuries and causes of injuries. The data of the interview were recorded. To conduct this study, paper, pen and tape recorder were used.

Results and Discussion

The study gathered retrospective data from the documents of BKSP to find out the percentage of hamstring injury in respect of different types of games. The retrospective data of the BKSP stated that in BKSP among the injury of the total body part the hamstring injury were 10.49 percentages, among them more common in Athletics (28.57%), Hockey (14.58%), Football (11.34%) and Cricket (3.85%). All the respondents of the study were asked about the causes and management of their injury.

From the qualitative perspectives of the respondents, it was revealed that the main causes of injury of injury among the athletes were dehydration, night awake, poor nutrition, excessive load, nervousness, and improper rest. In addition, the respondents stated that recurrence of hamstring injury was more common and it was a risk factor of hamstring injury. In Bangladesh from BKSP the intrinsic and extrinsic factors predispose the injury including intrinsic factors, muscles weakness, lack of flexibility, sex, body size and body composition. Extrinsic factor includes Training error (exercise intensity and volume, excessive fatigue, inadequate recovery), psychological factors (excessive psychological arousal, loss of concentration) and inadequate and improper nutrition [12].

Considering the management of the hamstring injury, all the respondents mentioned that in BKSP initial management of hamstring injury had followed PRICE (Protection, Rest, Ice, Compression and Elevation) protocol including ice for 20 minutes with two hours interval at the acute stage of injury. The current findings of the study supported in accordance with a recent systematic review by [13] suggesting with cryo-therapy for 20 minutes at every two hours at the acute stage of hamstring injury. All the respondents stated that rehabilitation protocol consisted with lengthening type of exercises which was more effective than a conventional protocol. However, return to play depends on absence of Pain, hamstring strength, flexibility or range of motion. Furthermore, functional performance, medical staff clearance, cerebro-muscular capabilities extent of edema and lumbar rotation stability along with other criteria of return to play after hamstring injury were considered for the return of their play at BKSP.A study with prospective randomized comparison of 2 rehabilitation programs by [14], stated that a rehabilitation program consisting of progressive agility and trunk stabilization exercises is effective in promoting return to sports and in preventing injury recurrence in athletes who have sustained an acute hamstring strain rather than a more traditional isolated stretching and strengthening exercise program.

A similar hamstring strength, similar flexibility or range of motion, athlete should be certified as medically fit before returning to play, and other criteria as 80% isotonic knee flexion strength as compared with the normal opposite leg, no pain when sprinting and having progressed through a sport-specific rehabilitation program. In case of low grade injury (I or II), an average expected return to sport of approximately 2 weeks. The initiation of Nordic hamstring exercises may decrease the incidence of acute hamstring injuries and potentially decrease the total number of days missed due to injury in professional baseball players. Strengthening program for strength imbalance athlete can prevent the risk of hamstring injury.

Verrall., *et al*. (2005) added intervention for hamstring strain like PNF stretching, sport specific training and anaerobic training [15]. In another study of Dadebo., *et al.* (2004) concluded that flexibility with active stretching training, however strength training and endurance training modalities were also included that is effective for hamstring strain during football training sessions [16]. From study to study each individual stretching exercise varied, generally for 15 to 30 seconds and repeated at least three times per leg. Duration of stretching exercises three to five times a week. After training stage the stretching exercises are performed because tired muscles are more prone to

injury compared to muscles that are not exhausted they absorb less energy. Flexibility training with tension-relaxation stretching (TRS) was performed, with 45-second stretches. Preventing injury of hamstring muscles by flexibility training because it helps to improve the mobility of footballer players also helps to prevent injuries in tired muscles the diagnosis of hamstring strain is determined in a clinical examination by a medical professional and made by team doctors, MRI radiologist, medical staff, or the coaches. Arnason., *et al.* (2008) find out that warm-up stretching combined with eccentric strength training have a positive effect on hamstring injury prevention [6].

Initial management strategies of hamstring injury were hardly found effective due to lack of clinical research. Although the initial treatment of muscle strain is accepted as rest, ice, compression, and elevation but no consensus exists for their rehabilitation. During the treatment with ice active knee flexion and extension exercises could be performed because the exercises are pain free to prevent further injury during the rehabilitation [17]. Criteria of return to play after hamstring injury include absence of pain that means no pain on palpation and during performance testing, direct palpation of the hamstring muscle the other procedure of check absence of pain, tested in the end position of the passive straight leg raise there were no elicit of pain, pain-free running and pain-free functional activities peculiar to a given sport were also used mal-hamstring flexibility as a 10% deficit between the injured and the uninjured legs [18]. Another retrospective study by Kilcoyne., *et al*. (2011) stated that in case of low injury grade (I or II), an average expected return to sport of approximately 2 weeks and athletes were allowed to return to sport after return of symmetrical strength and range of motion with no pain during sprinting [19]. Furthermore, decrease or prevent the risk of hamstring injury any athletes with a strength imbalance could undergo a strengthening program, that means strengthening program for strength imbalance athlete can prevent the risk of hamstring injury [20].

Conclusion

Hamstring injuries one of the most common injury in sports and often result in chronic pain, recurrent hamstring strains and reduced sports performance. The management depends on healing process of muscle strain that means according to healing stage. Physiotherapy Initial management depends on RICE protocol and doses of cryotherapy or ice use 20 minutes every two hourly. Rehabilitation protocol consisting of mainly lengthening type of exercises and it is more effective than a conventional protocol in promoting return to elite football after acute hamstring injury. Return to play depends on absence of Pain, similar hamstring strength, similar flexibility or range of motion, functional performance other criteria of return to play after hamstring injury were full return of cerebro-muscular capabilities extent of edema, and lumbar rotation stability. Nordic hamstring exercises may decrease the incidence of acute hamstring injuries and potentially decrease the total number of days missed. Strengthening program for strength imbalance athlete can prevent the risk of hamstring injury.

Conflict of Interest

There was no conflict of interest exists of this study.

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