

Frequency of Hamstring Muscle Strain Injuries in Athletes of Different Universities of Lahore: A Cross-sectional Study

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Highlights:

- ▶ Hamstring strain is the most prevalent non-contact injury in athletes
- ▶ Frequency of Hamstring Strain Injury (HSI) was found to be high in selected sample of athletes.
- ▶ Age and previous injury were identified as the main risk factors for injury among athletes of universities due to lack of sports specific coaching

Abstract:

Hamstring Strain Injury (HSI), one of the common sports injury and it result from a complex interaction of multiple risk factors and events. Only a fraction of these have been identified. The purpose of the study was to find the frequency of HSI in athletes of different Universities of Lahore.

Objectives:

To determine the frequency of hamstring muscle strain injuries in athletes of different Universities of Lahore.

Methodology:

This cross-sectional study involved 102 participants selected by convenient sampling, aged between 18-25 years, from both genders and different Universities of Lahore playing at national or provincial level. Those with critical risk factors such as contusion, bruises, ecchymosis and other pathological conditions i.e. tendon rupture, chronic tendinopathies, fracture and tumor etc. were excluded. The data were tabulated and analyzed by using SPSS version 20.0.

Results:

The frequency of HSI was 70%. There were 36(35.3%) respondents who got injured once and were mostly right sided. Those who suffered two times were 17(16.7%), three times 9(8.8%), four

times 4 (3.9%) and five times were 4 (3.9%). Athletes suffering from HSIs reported their symptoms to aggravate during stretching (45.1%), during jogging (28.4%), accelerating (28.4%) and while changing direction during running (21.6%).

Conclusions:

Frequency of HSIs was found to be high in selected sample of athletes. Age and previous injury were identified as the main risk factors for injury among athletes of universities due to lack of sports specific coaching.

Key words:

Athletes, Lahore, Hamstring strain injury, university, sports

Introduction:

The hamstring muscles are two-joint muscles that flex the knee joint and extend the hip joint.¹ HSIs are classified into grades: as grade I refers to a mild strain or tear of muscle fibers, grade II refers to moderate strain or tear and grade III refers to a complete tear of muscle fiber.² In sports, common injuries of hamstring muscles are strain-type which includes quick alteration in direction and jumping, running, speeding up, losing speed.³

The incidence of recurrent injury runs between 12 and 14% in soccer players, and as high as 30% in Australian rules football.⁴ According to Proske *U et al.*, in team sports, such as rugby, football and cricket, the incidence of HSIs has shown an upward trend over the past two decades, and currently represents between 12%-17% of total injuries, with a high rate of recurrence.^{5,6} An important point is that risk factors can be divided into modifiable and non-modifiable factors. Non-modifiable risk factors are gender, age and height while modifiable which can change through physical training or

behavioral approaches, such as strength, balance, weight or flexibility.¹ In general, risk factors can be broadly categorized into muscle risk factors and clinical risk factors. Muscle conditions that have been studied include muscle weakness, lack of flexibility, increased muscle stiffness, poor lumbar posture, poor warmup, and muscle fatigue.⁷ Clinical risk factors includes injuries that occur due to direct trauma following contusion, bruises, ecchymosis and other pathological conditions hematoma formation and hair line fracture of femur. A traumatic distraction or overuse injury to the hamstring muscle leading to a player being unable to fully participate in training or match play.⁸

HSI is one of the most common sports injuries that have significant effects on patients' quality of life and sports career. The high recurrence rate and serious consequences of this injury have not been fully recognized. The prevalence of 30% of players with a history of HSI further supports the high incidence of this injury in competitive football. The high incidence of recurrent hamstring strains may be attributable to inadequate rehabilitation or premature return to participation.⁹ HSIs are most likely to occur during competitions.¹⁰ In addition, as compared to women, men are more likely to sustain hamstring strains in general and when restricted to recurrent injuries.¹¹ Despite these findings, there is a dearth of recent research related to the epidemiology of hamstring strains across a wide range of sports. Many studies have sought to evaluate prevention and other programs aimed at increasing range of motion and muscle extensibility,¹² but it is unclear if the proliferation of these programs has had beneficial effects by lowering injury rates. Examining more recent research can help ascertain whether the patterns of hamstring strains have changed. This study utilized data to find the frequency of HSIs in athletes of different universities of Lahore.

Methodology:

A cross-sectional study in which the data were collected from 102 athletes of different

Universities of Lahore. Sample was calculated with 95% confidence interval and 5% absolute precision. Athletes of age group between 18-25 years from different universities playing nationally or at provincial level were included and those having clinical risk factors such as contusion, bruises, ecchymosis and other pathological conditions i.e. tendon rupture, chronic tendinopathies, fracture and tumor etc. were excluded from the study. The data were collected through proforma. For qualitative data, percentages and pie charts were used. The quantitative data (age, gender, smoking, dominant hand) were presented in form of mean and standard deviation.

Results:

Out of 102 respondents 63(61.8%) were male and 39(38.2%) female players. Most of the athletes were of 19 years (Figure 1). 70% was the frequency of hamstring strain injuries. 36 respondents got injured once, 17 suffered twice, 9 suffered thrice. 45.1% athletes complained that the symptoms aggravate who suffered from HSIs, 28.4% during jogging, 28.4% while accelerating and 21.6% and while changing direction during running (Figure 2).

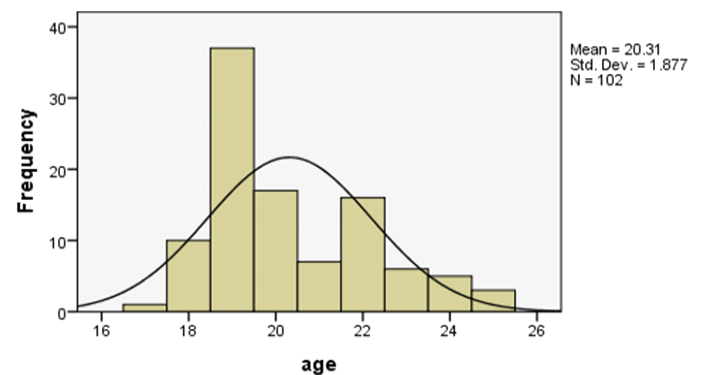
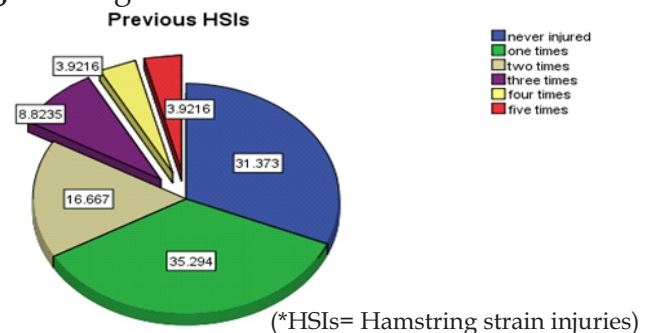


Figure 1: Age distribution of athletes



(*HSIs= Hamstring strain injuries)

Figure 2: Distribution of athletes affected with Hamstring strain injuries

Discussion:

Annually, more acute injuries have been reported among male than female athletes.^{5, 6,13,14} More acute injuries in female than male soccer players reported showed slightly greater aggregate injuries¹⁵. In addition, increased injury risk in females than males for swimmers¹⁶ and high-school cross-country runners has been reported.¹⁷ About 35% athletes in current study were observed with previous HSI. HSIs were more common in those who do not fully warm up and cool down before and after training respectively. Very few athletes experienced, their recent hamstring injury was due to jogging, strength, flexibility or groin cause. Overall, in accordance with our findings, earlier authors found no differences in overall injury incidence in different sports after adjustment for exposure time.¹⁸ However, a previous study found gender differences after adjusting exposure time.¹⁹ It seems that possible gender differences in the injury rate may be partly due to or explained by differences in exposure time.

HSIs are common injuries in sports characterized by maximal sprinting, kicking and sudden acceleration.²⁰ Another study reported that acute thigh injury in soccer players was the most common injury, causing a great amount of training and competition time loss.²¹ Evidence showed that previous hamstring strains and age are independent risk factors for new hamstring strains.²² Thigh injuries may partly be explained by muscle fatigue, high training intensities, insufficient warm-up and hamstring tightness, but the evidence for this is less convincing.²³ In some cases the number of players per soccer team may be low and therefore the high amount of playing time per player may increase the risk for thigh injuries, and also the risk for overall injuries. In this current study, there was no difference between the genders in acute thigh injuries. Higher joint laxity in females may contribute to this finding.

Conclusions:

Frequency of hamstring strain injury was found to be high in selected sample of athletes. HSIs are

common in university competitors, but this may result due to lack of knowledge of anatomy and functional capability of muscles by the coaches to the students. Proven risk factors like previous HSI, increased age and sudden change in direction were also present in university level competitors.

Recommendations:

Future studies may be conducted by choosing any one sport with same questionnaire and parameters to obtain specific risk factors related to that sport. Gender based, age based and sports based injuries would be conducted in comparison with modifiable risk factors like, previous HSI, recurrent injury, foul plying injury, strength and flexibility, etc. New studies can be carried out on professional players of individual sport. The same study can be done on non-professional street players with same parameters.

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