The Prevalence of Hamstring Tightness among the Male Athletes of University of Peradeniya in 2010, Sri Lanka

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Abstract

Muscle tightness is caused by a decrease in the ability of the muscle to deform, resulting in a decrease in the range of motion at the joint on which it acts. Tightness in hamstring muscles leads to hamstring injuries and hamstring injuries are the most common type of injury among athletes. These injuries are slow to recover, make high health expenditure and decrease the performance level of the athlete. The objectives of this study are to find the prevalence of the hamstring tightness among some categories of the sports and to find whether there is relationship of hamstring tightness with body height; femoral length; duration of warm-up and cool-down period.

Prevalence of hamstring tightness is present at significantly higher rates among athletes who are engaged in contact sport among other measured category of sports in the study. Within the confines of this study it was found that there is no significant association between hamstring tightness and body height, femoral length, duration of warm-up and cool-down periods. Therefore precautions to prevent hamstring tightness should be a major concern of the athletes who are playing contact sport.

Keywords: Hamstring tightness; Hamstring injuries; Active knee extension test

Introduction

The ability of an individual to move smoothly depends on his flexibility, an attribute that enhances both safety and optimal physical activity. The hamstrings is an example of muscle group that have a tendency to shorten [1]. Three muscles that are known collectively as the hamstring muscle cover the posterior thigh consisting of the semitendinosus, the semimembranosus, and the biceps femoris muscles.

Muscle tightness is caused by a decrease in the ability of the muscle to deform, resulting in a decrease in the range of motion at the joint on which it acts [2]. Inability to achieve greater than 160° of knee extension with hip at 90° of flexion is considered as hamstring tightness [3]. Hamstring tightness leads to hamstring injuries and hamstring injuries are the most common type of injury among athletes. These injuries are slow to recover, make high health expenditure and decrease the performance level of the athlete.

Materials and Methods

This is a descriptive study which was conducted to assess the prevalence of hamstring tightness among male athletes who represent university teams of the University of Peradeniya. We expected to approach 171 male students as our study population, who are members of University sports teams during 2010-2011. However, only 128 athletes, ranging in age from 20 to 28 years, with a mean age of 24 years, volunteered to participate in this study. Subjects were limited to male athletes with “normal” muscle strength and range of motion who had no history of orthopedic or neurological disorders of the hips, knees and spine, generalized ligament laxity, limb length discrepancy, scoliosis, hip dislocation and other deformities. Out of 128 athletes 25 subjects were excluded as they were within the exclusion criteria. In all, 103 out of 128 athletes took part in this study. There were 16 participants from the contact sports, 20 from athletics, 31 from martial arts and 36 from the other sports (swimming, weight lifting, volleyball, baseball, hockey, cricket and tennis). All data were gathered at the Department of Physical Education of the University of Peradeniya.

The Ethical Committee of the Faculty of Allied Health Sciences, University of Peradeniya, approved this study and all subjects gave their informed consent before participating in the study.

The test session included both tests and clinical testing on the same day from 4-7 pm. First the verbal consent was taken individually, followed by the instructions given to make them familiar with the examinations and the tests which are to be performed. Consequently, the athletes who agreed to participate in the study were given a self-administered questionnaire to fill. That was followed by taking measurements and performing the tests.

Each and every test was performed in separate stations by relevant examiners. Altogether there were four stations. The first station took the measurements of the body height, femoral length, and body weight. Femoral length was measured from upper part of the greater trochanter to lateral aspect of the base of the lateral epicondyle with an inch tape measure (Butterfly brand, China) with the subject lying supine. Body height was taken from vertex to toe tip to the nearest 0.1 cm using a inch tape measure (Butterfly brand, China). Body weight was measured using a portable weight scale (Beurer, Germany). Both left and right limb lengths were measured by using an inelastic tape measure (Butterfly brand, China) from the anterior superior iliac spine to the tip of the medial malleolus while subject lied supine to ascertain that there were no limb length discrepancies. Other than the above mentioned tests, the subjects were examined for scoliosis.

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congenital hip dislocation and for generalized ligament laxity. The range of motion was assessed for spinal flexion, extension, side flexion, and rotation.

Testing the hip joint movements and the hip joint examination were performed at the second station. The hip joint was assessed for range of motion of flexion, extension, abduction, adduction and medial and lateral rotation. Several tests were performed to examine the hip joint. Febers’ test was used to identify the hip joint/sacroiliac joint dysfunction, and to identify the spasm of iliofemoral muscle. The Thomas test was performed to examine hip flexion contractures.

At the third station, knee joint examination was carried out. The knee joint was examined by using several tests, the Valgus test to examine the medial collateral ligament and the Varus test to examine the lateral collateral ligament. Lachmann test was performed to identify instability of the anterior cruciate ligament and the posterior drawer test was performed to identify posterior cruciate ligament. Apply's test was performed to examine the meniscus. For checking the patella femoral syndrome, the Patella grinding test was performed.

Finally the hamstring tightness assessed by measuring the active knee extension angle of both knees with active knee extension test [4].

Results and Discussion

The criterion for subject inclusion was tight hamstrings as defined by a knee extension range of motion less than 160°. Active knee extension was measured using a goniometer, in 128 male athletes before starting their practice sessions.

Prevalence of hamstring tightness was measured on both legs of athletes participating in various categories of sports. Prevalence of hamstring tightness is present at significantly higher rates among athletes who engaged in contact sports rather than athletes who engaged in athletics, martial arts and other sports (swimming, weight lifting, volleyball, baseball, hockey, cricket and tennis) respectively (Figure 1).

The statistical significance was set at p<0.05. The analysis showed no significant difference (p<0.05) between body height vs. the hamstring tightness, femur length vs. the hamstring tightness, warm-up duration vs. hamstring tightness and cool down duration vs. hamstring tightness.

Results of this study should distribute among vulnerable athletes, their coaches and related medical staff to emphasize on a proper planned training program which will minimize the hamstring tightness.

Sports rehabilitation specific researchers should encourage for future researches on the topic for benefit of the field of sport.

Conclusion

Precautions to prevent hamstring tightness should be a major concern of the athletes who are playing contact sports. Majority of athletes had higher percentage of hamstring tightness in right leg. Future researchers have open area here for further reveal. This research can further be extended to the national teams and to the female population also.

References