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Self-Stretching in Standing Position to Improve Flexibility of Ilio-tibial Band Tightness

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Abstract

Objective: To determine the most efficient and effective stretch method for improving the flexibility of iliotibial band (ITB) by comparing the self-stretching in standing position of arms extending overhead (Group-A) and affected side arm placed on the wall (Group-B).

Methods: An experimental study was conducted among 20 male athletic students aged 18 -28 years who had ITB tightness assessed by physical assessment. Of the 20 participants, 10 were in group-A and 10 were in group-B. The ITB flexibility was measured using universal goniometer in Siegel's prone position method. The ROM was measured before demonstrating the self-stretching and repeated at end of the fourth week.

Results: The two stretches created statistically significant changes in ITB flexibility. The post-test results revealed that there is a significant difference between arms extending overhead (Mean ROM=12.30) and the affected arm placed over the wall (Mean ROM=9.20) on ITB flexibility [t (18) = 3.426, p = 0.003].

Conclusions: This study confirms that the position in standing with arms extending overhead is more effective and improving the flexibility of ITB than the position practiced is standing with the affected arm placed over the wall.

Key Words: Ilio-tibial band, Stretching, Flexibility, Tightness, Knee.

1. Introduction:

The iliotibial band (ITB) or tract is a lateral thickening of the fascia lata in the thigh and it originates from the tubercle of the iliac crest, runs distally down the lateral side of the thigh, and inserts on the lateral patellar retinaculum, tubercle of the tibia, and proximal fibular head. It also receives attachments for gluteal muscles, tensor fascia lata and vastus lateralis (Evans, 1979; Terry et al., 1986). The ITB, stabilize the knee in extension & semi-flexion and it helps in abduction and internal rotation of hip.

The ITB tightness can be unilateral or bilateral, but more often unilateral. It may be the primary or secondary cause of many lower extremity complaints. Painful areas of complaint include the low back, lateral hip or knee, and the patella (Lavine, 2010; Gose and Schweizer, 1989). Tightness of the ITB may play a role in patellofemoral syndrome (Hudson and Darthuy, 2008; Wilson et al., 2010). A friction syndrome (Iliotibial band friction syndrome) is the second most common overuse injury and it has been attributed to runners (Barber and Sutker, 1992; Linderburg et al., 1984), cyclists (Holmes et al., 1993), competitive rowers (Rumball et al., 2005), soccer, basketball or field hockey (Devan et al., 2004). Evaluation may show proximal hip flexor tightness or contracture, and a positive Ober's test for ITB tightness (Gose and Schweizer, 1989).

There are various methods of treatment for iliotibial band tightness, and most of the rehabilitation plans include stretches to increase ITB flexibility with the goal of decreasing impingement on the lateral femoral condyle (Orchard et al., 1996; Fredericson and Wolf, 2005). Stretching is found to provide the very good effects on iliotibial band tightness (Fredericson et al., 2002). It can be performed in two ways; assisted / passive stretching and self-stretching (Ylinen, 2007; Kishner, 2007).

Self-stretching is a type of stretching procedure that a patient can carry out independently after the supervised instruction by a therapist. Self-stretching is performed in various positions like side lying, standing, prone lying for iliotibial band tightness. Each position has its own effects, but to know about which position is more effective is an

important aspect to ease the practices for patients. It has been said that passive stretching alone doesn't fulfills or complete the patient's needs, but this study brings out needs and effects of various self-stretching in case of iliotibial band tightness.

Hence, this study aimed to compares the effectiveness of self-stretching in standing position of arms extending overhead and affected side arm placed on the wall to determine the most efficient and effective stretch for improving the flexibility of the iliotibial band**.**

2. Materials & Methods:

A experimental study was conducted with 20 male athletic persons who had diagnosed as iliotibial band tightness at Cherraan's college of physiotherapy outpatient department in Coimbatore from July, 2005 to December, 2005.

2.1. Selection Criteria:

The modified ober's test was used to assess the Iliotibial band tightness (Magee, 2014), and included male athletic students with aged 18 – 28 years for this study. This study excluded persons who had pathological or traumatic conditions, recent fractures in lower limbs and injuries or ligament injuries in hip and knee.

2.2. Self-Stretching:

Among the 20 participants, 10 were taught self-stretching in standing position with arms extending overhead called as Group-A and 10 were taught self-stretching in standing position with affected _side arm placed on the wall called as Group-B.

2.2.1. Group-A: Position with arms extending overhead

Standing on a normal extremity, with tight extremity crossed behind, keeping both feet on the floor, the patient side bends away from the tight side, shifting pelvis towards the tight side, allowing the normal knee to bend slightly. The hands are clasped overhead and arm on the same side of leg being stretched is stretched in the same direction.

2.2.2. Group-B: **Position with affected side arm placed on the wall**

Position: Standing on a normal extremity, with tight extremity crossed behind, keeping both feet on the floor, the patient side bends away from the tight side, shifting pelvis towards the tight side, allowing the normal knee to bend slightly. Affected side arm placed on the wall on the same side of the body downwards.

Figure-1: Self-Stretching position in standing

2.3. Measurement Tools:

The ITB flexibility was measured using universal goniometer in Siegel's Position (Shuch et al., 2002). Participant lay prone on a plinth while examiner abducts hip, knee flexed to 90 degree and hip extended, the thigh is adducted through available ROM (Range of Motion) while sacrum is stabilized. A universal goniometer was used, with one arm placed over both PSIS (Posterior Superior Iliac Spine) and other bisecting the posterior thigh.

2.4. Procedure:

Author arranged a convenient place in out-patient department (OPD) to demonstrate the self-stretching. The stretching exercise was advised to perform 15 repetitions with 15 seconds hold and 15 seconds rest for one time in the morning and another in evening. The participants were performed the exercise weekly 4 times under observation of the investigator. The ROM was measured before demonstrating the self-stretching and repeated at end of the fourth week. Also, the participants were requested to continue the stretching regularly to prevent the ITB tightness to avoid the frictional syndrome.

Permission obtained from dissertation committee of the Cherraan's college of Physiotherapy, Coimbatore. Each individual participants included in this study was informed about the purpose of study and a oral consent was taken prior to inclusion in the study. All the collected information about participants was kept confidential..

2.4. Statistics Analysis:

Data were entered and analysed using SPSS. The paired 't' test and unpaired (independent) 't'test was done to compare the pre-test with post-test to see the effectiveness of self-stretching position.

3. Results:

Table 1: Paired t test for group A and group B

Paired t test	Mean	Std. Deviation	't' value	p-value
Group A				
Pre Test	4.00	1.054	-12.136	.000
Post Test	12.30	2.111		
Group B				
Pre Test	4.20	1.033	-11.180	.000
Post Test	9.20	1.932		

Paired 't' test in group A: The group-A pre-test mean ROM is 4.00 (SD=1.054) and post-test mean ROM is 12.30 (SD=2.111), and the 't' test value is -12.136 (P <0.000) which is highly significant. The results revealed that the ITB flexibility was improved after practicing the self-stretching in standing position with arms extending overhead.

Paired 't' test in group B: The group-B pre-test mean ROM is 4.20 (SD=1.033) and post-test mean ROM is 9.20 (SD=1.932) and the 't' test value is -11.180 (P < 0.000) which is highly significant. The results revealed that the ITB flexibility was improved after practicing the self-stretching in standing position with affected side arm placed on the wall.

Table 2: Unpaired t test for group A and group B

Unpaired t test	Mean	Std. Deviation	't' value	p-value
Control Group	12.30	2.111	3.426	0.003
Experimental Group	9.20	1.932		

Unpaired 't' test for control and experimental group: The group-A post-test mean ROM is 12.30(SD=2.111) and group-B post-test mean ROM is 9.20(SD=1.932) and the 't' test value is 3.426 (P < 0.003) which is significant. The results revealed that the ITB flexibility was improved higher in practicing the self-stretching in standing position with arms extending overhead when compared with the self-stretching in standing position with affected side arm placed on the wall.

4. Discussion:

The conservative treatment methods are the best for most of the physical problems. In the recent years, it was accepted and practiced more by the people. In ITB tightness, the conservative approaches are ice, rest, activity modifications, ultrasound, massage, orthosis, contrast baths and self-stretching techniques. Most of the time, the self-stretching positions have made both therapists and patients confused about which to be practiced for effective way to improve muscles flexibility. In this study, we demonstrated the effectiveness of the two common self-stretches on ITB flexibility and measured the flexibility using a goniometer.

In this study observed that a significant improvement of flexibility in ITB by the self-stretching in standing positions of both arms extending overhead and affected side placed over the wall. Moreover, the arms extending overhead position showed a higher flexibility when compared with the position of affected side placed over the wall. Fredericson et al. (2002), done a similar study in Standford, USA and compared three common standing stretches for the ITB in arms at side, arms extending overhead, and arms reaching diagonally downward. They found that all three stretches created statistically significant changes in ITB flexibility and the stretch of arms extending overhead was consistently most effective in ITB flexibility when compared other two stretches.

Flexibility is the ability to move a single joint or a series of joints through an unrestricted, pain-free range of motion.[16] Flexibility is the main component of physical fitness is the ability of a musculotendinous unit to lengthen, relax and yield to a stretch force. Individuals who do not regularly participate in a flexibility program can develop mild tightness, particularly in two joint structures. Sports_persons lacking proper flexibility can develop overuse injuries and these can be resolved in a relatively short time with gentle stretching exercises.

The flexibility obtained not only depends on the regularity of practice, but also the positions. A regular self-stretching exercise programme must be practiced to maintain and improve the flexibility of Iliotibial band. It must be practiced as self-activity at home regularly. It helps not only to prevent injuries but also to maintain proper physical fitness. The clinical practices should have a regular follow-up for obtaining good results, the positions which were selected also depends on the comfort of the patients.

This study conducted with relatively small size. However, the study demonstrated flexibility improvement of ITB band. This is a time bound study and there is a difficulty in regular follow-up after completion of the study. Self-stretching of iliotibial band can also be practiced in various other positions like prone kneeling and side lying. Further study can be done in longitudinally with larger group.

5. Conclusion:

This study concluded that both two self-stretching positions in standing were improving the flexibility of ITB. Furthermore, the position in standing with arms extending over head is more effective than the position practiced is standing with affected arm placed over the wall. The clinical practices should have a regular follow-up for obtaining good results, the positions which were selected also depends on the comfort of the patients.

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6. References:

[1]. Barber FA, Sutker AN (1992). Iliotibial band syndrome. *Sports Med*, 14, 144-8

[2]. Devan MR, Pescatello LS, Faghri P, Anderson J (2004). A prospective study of overuse knee injuries among female athletes with muscle imbalances and structural abnormalities. *J Athl Train,* 39(3), 263-7.

[3]. Evans P (1979). The postural function of the iliotibial tract. *Ann R Coll Surg Engl,* 61, 232-4.

[4]. Fredericson M, White JJ, Macmahon JM, Andriacchi TP (2002). Quantitative analysis of the relative effectiveness of 3 iliotibial band stretches. *Arch Phys Med Rehabil*, 83(5), 589-92.

[5]. Fredericson M, Wolf C (2005). Iliotibial band syndrome in runners: innovations in treatment. *Sports Med* 35, 451-459.
[6]. Gose JC, Schweizer P (1989). Iliotibial band tightness. *J Ortho and Sports Physical Therapy*, 10(10), 399-407.
[7]. Holmes JC, Pruitt AL, Whalen NJ (1993). Iliotibial band syndrome in cyclists. *Am J Sports Med,* 21(3), 419-24.
[8]. Hudson Z, Darthuy E (2008). Iliotibial band tightness and patellofemoral pain syndrome: a case–control study. *Man Ther*, 2, 147-151.
[9]. Kishner C, Colby LA (2007). Therapeutic exercise; Foundation and Techniques. *Margaret Biblis*.
[10]. Lavine R (2010). Iliotibial band friction syndrome. *Current reviews in musculoskeletal medicine*, 3(1-4), 18-22.
[11]. Linderburg G, Pinshaw R, Noakes TD (1984). Iliotibial band syndrome in runners. *Phys Sportsmed,* 12, 118-30.
[12]. Magee D (2014). Orthopedic Physical Assessment. *Saunders; 6 editions*.
[13]. Orchard JW, Fricker PA, Abud AT, Mason BR (1996). Biomechanics of iliotibial band friction syndrome in runners. *Am J Sports Med*, 24, 375-379.
[14]. Rumball JS, Lebrun CM, DiCiacca SR, Orlando K (2005). Rowing injuries. *Sports Med*, 35(6), 537-55.
[15]. Shuch MB, Shedrowitzky MM, Wong CK (2002). The effectiveness of three common self-stretches on iliotibial band flexibility. *J Orthop Sports Phys Ther*, 32(1), A39.
[16]. Terry GC, Hughston JC, Norwood LA (1986). The anatomy of the iliopatellar band and the iliotibia tract. *Am J Sports Med,* 14, 39-45.
[17]. Wilson NA, Press JM, Koh JL, Hendrix RW, Zhang LQ (2010). In vivo noninvasive evaluation of abnormal patellar tracking during squatting in patients with patellofemoral pain. *J Bone Joint Surg Am,* 3, 558-566.
[18]. Ylinen JJ (2007). Stretching Therapy: For Sport and Manual Therapies. *Churchill Livingstone*, 2007

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