

The effect of applied direction of kinesiotaping from insertion to origin of hamstring on active knee extension in healthy individuals with hamstring tightnessDr. Aishwarya Kanhere¹, Dr. Ankita Dabshede²*Associate Professor, Department of Musculoskeletal Physiotherapy, TMV's Indutai Tilak College of Physiotherapy, Pune, India**Associate Professor, Department of Cardiorespiratory Physiotherapy, TMV's Indutai Tilak College of Physiotherapy, Pune, India***Abstract:**

Hamstring extensibility is important component of fitness. Kinesiotape uses a protective and rehabilitative taping technique. Selection of appropriate type of kinesiotaping program and stretching is an important factor for improving hamstring tightness. Aim is to find out the effect of applied direction of kinesiotaping from insertion origin of hamstring on active knee extension in healthy individuals with hamstring tightness. Objective is to determine the effect of applied direction of kinesiotaping from insertion to origin of hamstring on active knee extension in healthy individuals with hamstring tightness with the help of goniometer. Methodology: 60 healthy individuals between 18-26 years of age included in the study. Active knee extension test was measured with popliteal angle less than 160 degrees with the help of Goniometer. Group A (n=30) was applied with kinesiotaping from insertion to origin for 3 days. Group B (n=30) was given only holds relax stretching of hamstring for 3 days. Result: Subjects receiving kinesiotaping from insertion to origin shows statistically significant results with p value < 0.001 in post intervention score of active knee extension test. Conclusion: The study concluded that there was better improvement of kinesiotaping from insertion to origin of hamstring on active knee extension test in healthy individuals with hamstring tightness.

Keywords:

Active knee extension, Kinesiotaping, Stretching

Introduction:

The hamstrings comprise three large muscles, namely semitendinosus, semimembranosus and biceps femoris which originate from the ischial tuberosity insertion. Hamstring muscles are found to be the most prevalent for the tightness in the body. Maintenance of flexibility is an essential component of any conditioning program in developing its mobility, improving athletic performance and preventing injuries.

When the two-joint hamstring are required to contract with hip extended and the knee flexed to 90 degree or more, the hamstring must shorten over both the hip and knee. The hamstring will weaken as knee flexion proceed because not only are they approaching maximum shortening capability but also the muscle group must overcome the increasing tension in rectus femoris muscle that is approaching passive insufficiency.⁸ The AKET measures hamstring tightness by the angle subtended by knee flexion after a maximum active knee extension, with the hip

stabilized at 90 degrees. The test-retest reliability coefficient for the AKET was reported to be 0.99 for both lower limbs and this has been attributed to the strict body stabilization method, the well-defined end point of motion and accurate instrument placement of the test.⁽¹⁾

Kinesiotaping (KT) has become increasingly popular in the fields of sports medicine and rehabilitation. KT is a special therapeutic tape that was developed by the Japanese chiropractor Kenso Kase in the mid-1970s⁽¹⁾. Kinesiology tape is a 100% cotton, hypoallergenic, latex free, non-restrictive elastic adhesive tape, effective for 3-5 days of constant use, uses as a protective and rehabilitative taping technique. KT is made of elastic cotton fiber and acrylic adhesive in a wavy pattern. The distinctive design of KT allows for a longitudinal stretch of 55–60% of its original length and evaporation of body moisture.⁽²⁾

Aim is to compare the effect of applied direction of Kinesiotaping on active knee extension in healthy individuals with hamstring tightness. objective of the study is to determine the effect of kinesiotape application from insertion to origin along with hold relax technique for hamstring muscle on active knee extension. To compare the effect of kinesiotape application from origin to insertion along with hold relax technique for hamstring muscle over the effect of kinesiotape application from insertion to origin along with hold relax technique for hamstring muscle on active knee extension. The research design used for this study was a comparative experimental study.

The data was primary which was collected by the principle investigator. The study was conducted for 6 days. Both male and female subjects of age group between 18 to 26 years are healthy individuals with hamstring tightness. Age 18 to 26 years, n=90, were included for the study and randomly assigned into 3 groups with 30 subjects in each group.

Methodology:

Individuals included having hamstring tightness measured by active knee extension test with popliteal angle less than 160 degree Gender: Both male and female, age group between 18 to 26 years. Excluded if any History of lower limb or spinal injuries Limb length discrepancy Any spinal or lower limb deformities Neuromuscular disorders Cardiovascular disorders Skin allergy Any previous history of surgery Non co-operative individuals. Outcome measure is active knee extension test.⁽³⁾



Figures: Kinesiotape, Scissors, Goniometer

Tape 1 applied from the head of fibula in to the origin at the ischial tubersity. Tape 2 was affixed from insertion of pes anserinus to ischial tubersity ,then the base is anchored. Then the tape is rubbed with the muscle in the elongated position. Here the kinesio tapes was applied on day one and removed on day four for reapplication of kinesio tapes. Later the tapes were removed on day

6.

Discussion:

Kinesio® tape can be applied to inhibit an over-contracted muscle (Kase, 2008). Dr. Kase suggested the possible beneficial effects when the tapes are applied, included the following⁽⁴⁾ use the elasticity to create skin folds resulting in increased the space underneath the skin to improve circulation of blood and lymph⁽⁵⁾ to activate neurological suppression in order to reduce pain and increase joint range of motion; and⁽⁶⁾ adjust malalignment of muscle, myofascia and joint⁽⁷⁾ One of beneficial effects is improved muscle function regardless of weakened or tightened muscles. There is decrease in muscle tone and that's why reducing over contraction of the muscle. While the direction of applied tape beginning insertion to origin of muscle, which resulting in the direction of muscle contracted was opposite to direction of tapes retracted, then the KT might pull the skin or myofascia underneath the skin in the opposite direction to release the tightened area or muscles and improve flexibility and may reduce tension in the muscle.⁽⁸⁾

Conclusion:

Subjects with hamstring tightness receiving kinesiotaping from insertion to origin with hold-relax showed improvement on active knee extension as compared to subjects who receiving kinesiotaping.

Scope of study is to compare healthy and patients groups in this study, it could be used in subjects with hamstring tightness by physiotherapists to gain immediate effect.

References:

- Merino- Marbanr, et al. the acute effect of kinesiotaping on hamstring extensibility in university students. Journal of physical education and sport 2011, 23 -27
- Deepti Asthana 1, et al. Effectiveness of kinesiotaping in improving pain, lumbar extension range of motion and disability in patients with chronic non specific low back pain. International Journal of Physiotherapy and Research,2013, Vol1(5):293-99. ISSN 2321-1822
- Merino, R. 1; et al. Effect of kinesiotaping on hip and lower trunk range of motion in Triathletes. A Pilot study. Journal of sport and health research 2010, 2(2):109-118.
- Ayako Yoshida et al The Effect of kinesiotaping on lower trunk range of motions research in sports medicine: An International Journal, 15:2, 103-112.
- James W. Youdas Interrater Reliability of the Active-Knee-Extension Test for Hamstring Length in School-Aged Children 2001, volume 13 issue 1
- Yuan-Yuan Lee1, et al The effect of applied direction of kinesiotaping in ankle muscle strength and flexibility. 30th Annual Conference of Biomechanics in Sports – Melbourne 2012
- Kinesiology taping guide
- Lopez-Minarro et al., 2008; Sainz de Baranda et al., Validity of the unilateral sit-and- reach test as measure of hamstring muscle extensibility. Comparison with other protocols 2005.

- Kase, K., Hashimoto, T. and Okane, T. Kinesiotaping perfect manual: Amazing taping therapy to eliminate pain and muscle disorders. (1996)
- Paul W. M. Marshall, PhD, Jamie Mannion, MSc, Bernadette A. Murphy, PhD, DCExtensibility of the Hamstrings Is Best Explained by Mechanical Components of Muscle Contraction, Not Behavioral Measures in Individuals With Chronic Low Back Pain (2009)
- A brief history of kinesio tex taping
- Kathryn Krohn, David Castro, & Joseph Kling, Effects of kinesiotaping on hamstring flexibility. (2011)