Effect of Posterior Pelvic Tilt Taping in Women With Sacroiliac Joint Pain During Active Straight Leg Raising Who Habitually Wore High-Heeled Shoes: A Preliminary Study

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Abstract

Objective: The purpose of this study was to assess whether a 1-day application of posterior pelvic tilt taping (PPTT) using a kinesiology tape would decrease anterior pelvic tilt and active straight leg raising test scores in women with sacroiliac joint who habitually wore high-heeled shoes.

Methods: Sixteen women (mean age, 23.63 ± 3.18 years) were enrolled in this study. Anterior pelvic tilt was measured using a palpation meter before PPTT application, immediately after PPTT application, 1 day after PPTT application, and immediately after PPTT removal after 1 day of application. Active straight leg raising scores were measured at the same periods. Posterior pelvic tilt taping was applied in the target position (posterior pelvic tilt position).

Results: The anterior pelvic tilt was decreased during and after 1 day of PPTT application (before and after kinesiology tape removal) compared with the initial angle (all $P < .05$). Active straight leg raising scores were decreased during and 1 day after PPTT application (before and after kinesiology tape removal) compared with the initial score (all $P < .05$).

Conclusion: The results of this preliminary study suggests that PPTT may temporarily decrease anterior pelvic tilt and active straight leg raising score in women with sacroiliac joint pain who habitually wear high-heeled shoes.

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Key Indexing Terms: *Joint Pain; Pelvis; Athletic Tape*

In a recent survey on shoe choice, 59% of women chose to wear high-heeled shoes for 1 to 8 hours per day.[1] Many physicians and therapists consider habitual wearing of high-heeled shoes as a cause of an increase in the lumbar lordotic curvature, which could be a source of pain.[2] Because lumbar spine posture is associated with pelvic posture, changes in lumbar lordosis are in conjunction with changes in pelvic posture.[3] In a recent study, prolonged use of high-heeled shoes among adolescents showed increased lumbar lordosis and pelvic anteversion.[3]

Sacroiliac joint (SIJ) pain has many causes including inflammatory arthritides, ankylosis,[4,5] osteoarthritis, and posttraumatic arthritis.[6] Although requiring further investigation, the primary source of SIJ pain is thought to be SIJ dysfunction (SIJD).[7,8] The pain associated with SIJD suggests that the nociceptive and painful mechanical stress within the SIJ or acting on the surrounding tissues attached to the innominate bones is caused by pelvic asymmetry, or SIJ hypomobility,[9] hypermobility,[10] or instability,[11] with or without positional abnormalities. In contrast, DonTigny

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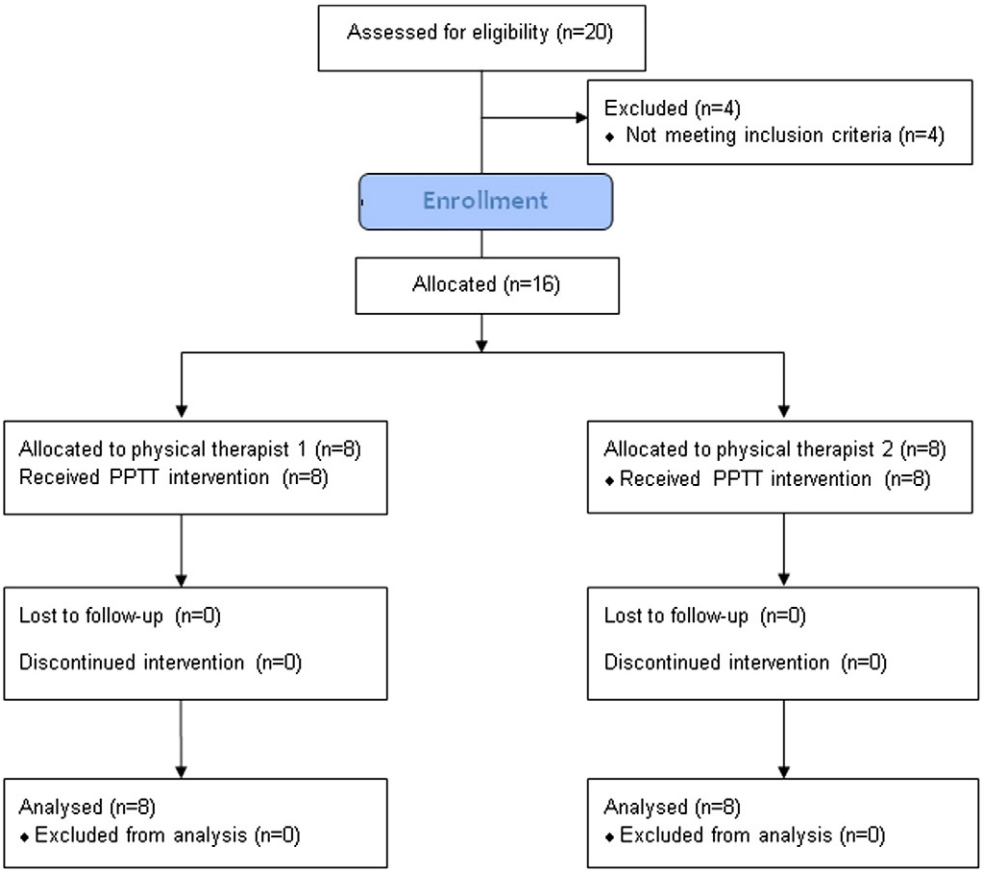

Fig 1. *Flow diagram for the study. PPTT, posterior pelvic tilt taping.*

defined SIJD as the pathological release of the self-bracing position with an anterior pelvic tilt.[12] In addition to the bilateral SIJD, lumbar lordosis was increased and the pelvis was tilted anteriorly.[12] Anterior rotation of the innominates in the absence of an adequate anterior pelvic support decreases tension on the sacrotuberous ligaments, releasing the self-bracing mechanism.[12]

The active straight leg raise (ASLR) test has been described as a clinical test for the assessment of the neuromuscular system to effectively control load transfer through the lumbopelvic region[13–15] via the "form closure" and "force closure" mechanisms.[16] Form closure describes the stability of the SIJ to resist shear forces according to its anatomy and the shape of its bony structure.[17–20] Force closure is a dynamic process performed by the muscular system, augmented by ligamentous and fascial structures in the region of the SIJ, to support the pelvis.[21] The ASLR test has been especially used in studies on pregnancy-related pelvic pain.[14–16,22] Mens et al[23] found that women with pregnancy-related pelvic pain perceived greater difficulty in performing the ASLR test. In patients with SIJ pain, changes in the kinematic data of the pelvic floor and alterations in respiratory function were found while performing the ASLR test compared with healthy participants.[21] The change in motor responses during ASLR in participants with SIJ pain compensates for the lack of load transfer to the lumbopelvic region by the neuromuscular system as a result of the form and/or force closure mechanisms.[21] The methods used to score the ASLR test were scales of perceived difficulty (patient reported)[24] and positive (improved performance in the second ASLR test with manual pelvic compression)/negative (examiner reported), respectively.[21,23]

Kinesiology taping (KT), in combination with other treatment techniques, is a relatively new therapeutic method used in orthopedic,[25] neuromuscular rehabilitation,[26,27] and sports medicine[28] to achieve strength in weakened muscles,[29] control joint instability, assist postural alignment,[30] relieve pain,[25,31–33] improve circulation of lymph and blood flow,[34] and enhance muscular functions.[27,35]

No study has been published thus far on the ASLR test that involves women with SIJ pain who habitually wear high-heeled shoes. In addition, the mechanical correction effects of KT application in the short term (eg, 1 day) and after tape removal in comparison with the mechanical correction effect of immediate[36] or medium- to long-term