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Biomechanical Relation between Calf Muscle and Low Back Pain

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ABSTRACT

Low back pain is defined as pain and discomfort in the lumbosacral region, below the 12th rib and above the inferior gluteal folds. There are three types of low back pain: nonspecific pain with nerve root symptoms; pain resulting from serious injury. It is the most common musculoskeletal conditions that interferes with functioning and is often associated with muscle tightness. The literature supports the linkage between tightness of hamstrings and iliopsoas muscles but we did not come across studies depicting relationship between tightness of the calf and low back pain. Therefore, the aim is to determine the biomechanical relation between calf muscle tightness and low back pain. The extensive search for this study was conducted through Google Scholar Medline, PubMed (National Library of Medicine), Research Gate, articles including from 2010-2024 have been used. This study concludes that, calf tightness restricts ankle dorsiflexion, leading tocompensatory movements and disrupts normal alignment of spine contributing to low back pain. It has been found that foot overpronation and flat foot are interrelated and associated with gastrocnemius tightness which is the cause of low back pain. Moreover, restricted ankle dorsiflexion can cause increased anterior pelvic tilt leading to hyper-lordosis and low back pain. Additionally, calf tightness can impair shock absorption capabilities of lower limb transmitting more forces to lumbar spine and increasing the risk of low back pain. So, treating them together comes with better results.

Keywords: Calf stretching, Gastrocnemius tightness, Hyper-pronation.