

Assessment of Transverse Abdominis Activation during Three Different Exercises in Low Back Pain Patients: Measurement with Real-Time Ultrasonography

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Abstract : Introduction: Chronic low back pain (CLBP) is a major public health problem and is the leading musculoskeletal cause of disability. Altered neuromuscular control of core muscles, particularly transverses abdominis (TrA) is thought to be a contributing factor for the development of CLBP. Therefore, various exercises targeting the TrA are commonly incorporated into the rehabilitation. Objectives: To investigate the effects of 3 different core exercises on activation capacity of TrA muscle in individuals with CLBP as compared with healthy controls. Methodology: Thickness of TrA muscle was measured by ultrasound imaging in 30 patients with CLBP and 30 healthy controls. Measurements were taken during 3 different TrA activation exercises i.e Abdominal drawing in maneuver (ADIM), Abdominal drawing in with straight leg raise (ADSLR) and breathe hold at maximum expiration (ME). Thickness of the muscle at rest (at the end of normal tidal expiration) was taken as a baseline measure. Results: There was a significant difference between the healthy subjects and patients with low back pain with regard to the thickness of TrA at rest and thickness during contraction. ADIM produced a significant increase in the thickness of TrA compared to ADSLR and ME ($p < 0.001$). Also, increase in thickness of TrA was more in the control group than patients with low back pain. Conclusion: CLBP patients exhibited atrophy of TrA muscle with delayed activation. Also, of the various core exercises, ADIM can be an effective method for activation of TrA.

Keywords : LBP, CLBP, ADSLR, ADIM

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