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Conceptual Paper

Correlation Between Impaired Postural Control and Balance of Trunk in Chronic Low Back Pain Patients

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Postural Control is an ability to maintain the body 's Centre of Gravity (COG) within the limits of stability as determined by base of support. The was differences of motor control of activities of daily living such as walking and lifting of a healthy individuals compared to LBP patients. It was proven that LBP patients may have impaired control over trunk posture and movement. Dynamic control is important in many functional tasks as it required integration of appropriate levels of proprioception, range of motion, and strength [1].

Patients with Chronic Low Back Pain (CLBP) presents with paraspinals and other trunk muscle weakness and reduce in coordination of lower back muscle. Thus, this reduction in muscular strength and coordination affects postural stability, balance and neuromuscular control in patients with CLBP.' Leinonen reports that delayed response of trunk muscles could be related to inaccurate information processing from higher centers of the central nervous system related to motor control. Individuals with low back pain have longer reflex latencies compared to healthy people as there are delayed response of stimulus of the muscle and reflex during sudden load response. These longer latencies is a pre-existing risk factor that could affect the balance of trunk of CLBP patients. Additionally, the absence of visual feedback, poorer balance performance has been associated with longer onset times of the trunk muscles. There was increased displacement of the centre of pressure while standing upright and greater medial – lateral postural sway for individuals with CLBP as they present with balance deficits [2].

Multifidus and Tranverse Abdominis are core stabilizing muscles of the trunk that would help to maintain dynamic during lower extremity movement by providing support to lumbar spine. There is little or absent of activation of Multifidus and Tranverse Abdominis in back pain sufferers. Individuals with CLBP should learn conscious activation of core stabilizing muscles without contracting global trunk musculature which is the initial step for developing habitual activation for spinal stability of back pain sufferers with poor spinal control. Evidence shows that the treatment program focused on improving trunk control through core stabilizing exercises lead to significant improvement in pain, disability and quality of life [3].

In contrast to popular belief of activation of core muscles for trunk stabilization exercises for back pain, challenging trunk balance exercises with flexibility exercises does not require voluntary contraction of specific muscles. Additionally, maintenance of the unstable positions and the exercises was incorporated as functional tasks in which the recruitment of the core muscles would be automatic.

Variation of trunk balance exercises that found to be effective in reducing CLBP:

1. Trunk Balance exercises were performed kneeling on a pillow with rotation of the trunk, head and upper limbs to 1 direction, kneeling on a pillow, moving of the upper limbs in flexion and extension
2. In quadruped position, extend opposite upper and lower limbs and in supine position, lift the pelvis up with one limb hip and knee extension.
3. Each exercise was challenged by maintenance for 30 seconds hold, total of 5 minutes for each exercise plus changing the support base (couch or pillow), closing eyes and then head and limbs movements.

In conclusion, selection of trunk flexibility and challenging balance exercises are more effective in promote recruitment of the trunk musculature, thus help to improve pain, disability and quality of life in patients with CLBP. Treatment plan for CLBP patient should be carried out after thorough examination and evaluation. The appropriate interventions for CLBP must include trunk balance exercises according to patient's functional capability and convenience.

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