Point of View

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Reeves and colleagues should be congratulated for providing an insightful contribution to the literature. This study provides information suggesting how the spine's musculoskeletal control system behaves once back pain is present. The article demonstrates that when patients with low back pain paraspinal muscles are exposed to SR stimulation (under these conditions) postural control improves in the lateral plane, yet no differences in spine proprioception are observed. The study provides another "piece of the puzzle" into the spine's highly evolved musculoskeletal control system. However, the real value of this article can be appreciated when considering it in the framework of the larger body of literature.

Recent reports[1] have similarly suggested altered proprioceptive postural control in those with low back pain. In addition, della Volpe *et al*[2] suggested that the postural control system integrates information from various sources (including the somatosensory system) and that disruption of the information from any of these sources may influence the output of the postural control system. They suggest that this alteration may occur at either the peripheral proprioceptive system or during central processing of proprioceptive information.

The idea that this processing of postural control is performed at a central level was supported through studies by Mok *et al*[3] who demonstrated that preparatory spinal movements may be associated with compromised quality of trunk control. Popa *et al*[4] suggested that a reweighting of sensory input occurs possibly due to deterioration of its reliability. Both of these studies indicate an "executive" program that can override or bias the local control mechanisms.

Collectively, these studies suggest that we need to consider how the musculoskeletal system behaves in its larger "control" context. This study considers the system as a "closed loop" control system in that the implication was that proprioception would directly influence postural control and time delays in the signal might influence performance. However, the findings might also suggest that when experiencing low back pain, the executive control system may override the proprioception-postural feedback control loop to the point where it can be considered an "open loop" or anticipatory control system. Such reasoning might explain guarding behavior in those experiencing low back.

References

1. Brumagne S, Janssens L, Knapen S, et al. Persons with recurrent low back pain exhibit a rigid postural control strategy. *Eur Spine J* 2008;17:1177–84.
2. della Volpe R, Popa T, Ginanneschi F, et al. Changes in coordination of postural control during dynamic stance in chronic low back pain patients. *Gait Posture* 2006;24:349–55.
3. Mok NW, Brauer SG, Hodges PW. Failure to use movement in postural strategies leads to increased spinal displacement in low back pain. *Spine* 2007; 32:E537–43.
4. Popa T, Bonifazi M, della Volpe R, et al. Adaptive changes in postural strategy selection in chronic low back pain. *Exp Brain Res* 2007;177:411–8.

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