

Original Article

A hypothesis of chronic back pain: ligament subfailure injuries lead to muscle control dysfunction

European Spine Journal

July 27, 2005

Manohar M. Panjabi

From the Department of Orthopaedics and Rehabilitation, Yale University School of Medicine

KEY POINTS

- 1) The spinal ligaments, disc annulus and facet capsules are innervated with mechanoreceptors.
- 2) Degenerative spinal disease, single trauma, or cumulative microtrauma causes subfailure injuries of the spinal ligaments, disc and facet capsules, causing abnormal firing of the embedded mechanoreceptors.
- 3) There is increased nerve ingrowth into diseased intervertebral discs.
- 4) Subfailure injury of spinal ligaments is defined as an injury caused by stretching of the tissue beyond its physiological limit, but less than its failure point. **[IMPORTANT: This is the classic definition of a whiplash injury].**
- 5) Chronic whiplash patients have decreased active neck range of motion, but an increase in passive neck range of motion.
- 6) Injured muscles heal relatively quickly due to an abundant blood supply and therefore they are not the main cause of chronic back pain. **[Important]**
- 7) Ligament and disc injuries heal poorly and therefore lead to tissue degeneration over time.
- 8) "Thus, the ligament injuries are more likely to be the major cause of the chronic back pain." **[Very Important]**
- 9) The subfailure ligament injuries may heal with scar tissue over time, resulting in long-term or permanent mechanoreception. **[The Fibrosis Of Repair]**

From the Desk of Dr. Chris Quigley Director: The Boston Wellness Group
102 Charles Street, Boston Massachusetts 02114
617-720-1992 TheBostonWellnessGroup.com

Dear Dr. Panjabi:

Congratulations on your article "A hypothesis of chronic back pain: ligament subfailure injuries lead to muscle control dysfunction" European Spine Journal, July 27, 2005.

The hypothesis you presented is consistent with the perspective offered within the chiropractic community for decades. In the parlance of the chiropractic profession you have expertly and vividly described what is referred to as a vertebral subluxation. The chiropractic community has been studying, writing about and modifying its perspective on the phenomenon you articulated for more than a century.

Our present hypothesis suggests that the altered mechanoreceptive afferent driven motor mismatch can be corrected by the firing of the mechanoreceptors of the facet joint capsules which are activated by means of a chiropractic adjustment (1). The hypothesis you articulated, explains why chiropractic spinal adjustments have proven to be more effective in treating chronic spinal pain when compared to medication, exercise, and needle acupuncture (2, 3, 4, 5, 6, 7, 8, 9).

Respectfully,

Daniel J. Murphy, DC
Faculty, Life Chiropractic College West

References

- 1) Indahl A, Kaigle AM, Reikeras O et al (1997) Interaction between the porcine lumbar intervertebral disc, zygapophysial joints, and paraspinal muscles. Spine 22:2834-2840
- 2) WH Kirkaldy-Willis and JD Cassidy, Spinal manipulation in the treatment of low back pain, Canadian Family Physician, Vol. 31, March 1985, pp536-40.
- 3) TW Meade, S Dyer, W Browne, J Townsend, AO Frank. Low back pain of mechanical origin: randomised comparison of chiropractic and hospital outpatient treatment. British Medical Journal, June 2, 1990;300: 1431-7.
- 4) The Lancet, Chiropractors and low back pain, July 28, 1990, p. 220.
- 5) TW Meade, S Dyer, W Browne, AO Frank. Randomised comparison of chiropractic for low back pain: results from extended follow up. British Medical Journal, August 5, 1995;311: 349-51.
- 6) Woodward MN, Cook JC, Gargan MF, Bannister GC. Chiropractic treatment of chronic 'whiplash' injuries. Injury. 1996 Nov;27(9):643-5.
- 7) S Khan, J Cook, M Gargan, G Bannister. A symptomatic classification of whiplash injury and the implications for treatment. Journal of orthopaedic Medicine 21(1) 1999:22-5.
- 8) Lynton GF Giles and Reinhold Muller, Chronic Spinal Pain: A Randomized Clinical Trial Comparing Medication, Acupuncture, and Spinal Manipulation, Spine, July 15, 2003; 28(14): 1490-1502
- 9) Reinhold Muller, PhD, Lynton G.F. Giles, DC, PhD, Long-Term Follow-up of a Randomized Clinical Trial Assessing the Efficacy of Medication, Acupuncture, and Spinal Manipulation for Chronic Mechanical Spinal Pain Syndromes, Journal of Manipulative and Physiological Therapeutics, January 2005, Volume 28, Number 1.

From the Desk of Dr. Chris Quigley Director: The Boston Wellness Group
102 Charles Street, Boston Massachusetts 02114
617-720-1992 TheBostonWellnessGroup.com