CORR Insights®: The Peripheral Neuronal Phenotype is Important in the Pathogenesis of Painful Human Tendinopathy: A Systematic Review

David C. Ring MD, PhD

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Where are We Now?

Myxoid degeneration is commonly found in various attachment points of tendon or ligament to bone during the middle third of a patient's life, regardless of his or her activity level [3]. Enthesopathies are characterized by a benign, self-limiting course [1, 4, 6], although some tendons — often previously asymptomatic — rupture and rotator cuff tendinopathy can progress to a large defect that leads to arthropathy. “Overuse” and “microtears” are appealing concepts that do not seem plausible given the epidemiology and natural history of most enthesopathies.

Perhaps most puzzling is the unexplained variation in pain intensity and magnitude of disability. In the biomedical illness paradigm, we attempt to reduce illness to

specific pathophysiologies, including variations in neuronal phenotype as addressed in the current study. If we can identify pathophysiology at the heart of the variations, we can intervene to correct the physiology, ultimately reducing symptoms and disability.

The data in the current study indicated some alterations in nerve physiology. Unfortunately, the control groups are inadequate. It is unclear if the pathophysiology is the cause or consequence of the disease. Additionally, it is unclear if neuronal pathophysiology correlates with symptoms and disability.

Where Do We Need to Go?

Nociception is the pathophysiology of actual or potential tissue damage. The biochemical changes produced by pinching yourself create signals that are carried through the nerves, to the spinal cord, and the brain. Pain is the cognitive, emotional, and behavioral response to nociception. Some nociception, like a yoga stretch, is good. Some nociception, such as a burn from a hot pan, is bad. However, the vast majority of nociception is neutral. There are the aches and pains that are more common as we age. Then there are the backaches, headaches and stomach aches that are unpleasant but do not indicate any concerning pathophysiology.

Addressing nociception can be fruitful. For instance, aspirin and acetaminophen can alter the nociceptive pathway and decrease pain. Yet, this can be misleading. As the number of placebo injection-controlled, double-blind, prospective, randomized trials of corticosteroid injection for lateral epicondylitis grows, it becomes increasingly difficult to escape the conclusion that our confidence in this treatment was nothing more than wishful thinking and self-deception [1, 4]. It is time to take a broader, more inclusive

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D. C. Ring (✉)

Massachusetts General Hospital, 55 Fruit St., Boston,
MA 02114, USA

e-mail: dring@partners.org

view of the human illness experience. We can benefit from a biopsychosocial illness paradigm.

How Do We Get There?

The amount of pain experienced for a given nociception is largely a matter of mindset and circumstances. Psychological (self-efficacy, catastrophic thinking, symptoms of depression, heightened illness concern) and sociological factors (culture, secondary gain, circumstantial family and life stressors), consistently account for more symptom and disability variation compared with pathophysiology measures (motion, radiological tests) [1, 5].

By studying neuropathology, we may discover additional ways to lessen the pain and disability associated with enthesopathies. I believe we may help our patients more if we find nonmedical ways to restore trust in a painful limb. As Nobel Prize-winning psychologist Daniel Kahneman demonstrated for economics [2], the key to good health may simply be making the effort to rethink our “first

impressions” or intuitive interpretations of nociception and other symptoms [5].

References

1. Coombes BK, Bisset L, Brooks P, Khan A, Vicenzino B. Effect of corticosteroid injection, physiotherapy, or both on clinical outcomes in patients with unilateral lateral epicondylalgia: a randomized controlled trial. *JAMA*. 2013;309:461–469.
2. Kahneman D. *Thinking Fast and Slow*. New York, New York: Farrar, Strauss, and Giroux. 2011. 1–499.
3. Lindenhovius A, Henket M, Gilligan BP, Lozano-Calderon S, Jupiter JB, Ring D. Injection of dexamethasone versus placebo for lateral elbow pain: a prospective, double-blind, randomized clinical trial. *J Hand Surg Am*. 2008;33:909–919.
4. Shaibani A, Workman R, Rothschild BM. The significance of enthesopathy as a skeletal phenomenon. *Clin Exp Rheumatol*. 1993;11:399–403.
5. Vranceanu AM, Barsky A, Ring D. Psychosocial aspects of disabling musculoskeletal pain. *J Bone Joint Surg Am*. 2009;91: 2014–2018.
6. Wolgin M, Cook C, Graham C, Mauldin D. Conservative treatment of plantar heel pain: long-term follow-up. *Foot Ankle Int*. 1994;15:97–102.