Impacts of Dry Needling on Patient Reported Outcomes in Patients with Lower Extremity Pain

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Background: Epidemiological studies have suggested that myofascial trigger points (MTrPs) may be the primary source of musculoskeletal pain in 30-85% of patients presenting to pain clinics and primary care centers.[1] MTrPs are localized, hyperirritable areas in taut bands of skeletal muscle fibers or the surrounding fascia that may contribute to muscle pain and dysfunction. Dry needling is a treatment modality in which solid, filiform needles are inserted into both MTrP and non-MTrP sites (e.g., tendons, ligaments, and teno-osseous insertions). Carrying a low risk of adverse effects, dry needling has been utilized in the treatment of lower extremity conditions such as chronic tendon overuse (e.g., Achilles and patellar tendinitis), medial tibial stress syndrome (MTSS, or "shin splints"), and greater trochanteric pain syndrome. In a systematic review of six studies on dry needling in the lower extremity, it was reported that dry needling consistently produced positive, statistically significant short-term outcomes.[2] While one of the included studies was conducted on players of Australian Rules football, a running-intensive sport, there has been limited research on dry needling outcomes in the United States, and none in runners.

Purpose: To assess how dry needling impacts patient reported outcomes (PROs) in participants, particularly runners, with lower extremity injuries.

Methods: This is a prospective cohort study of 50 participants over the age of 13 with injuries of the lower extremity. Potential participants will be recruited from a weekly dry needling clinic conducted by the principal investigator in the University of Rochester Medical Center's Department of Orthopaedics & Rehabilitation. Participants will complete a survey comprised of legacy measures of lower extremity pain and function, such as the Lower Extremity Functional Scale (LEFS) and Victorian Institute for Sports Assessment (VISA) questionnaires specific to tendinopathies of the lower limb (if applicable). In addition, they will complete PROMIS computer adaptive tests (CATs) for Pain Interference, Physical Function, and Depression. The survey and CATs will be administered through REDCap at baseline prior to participants' first dry needling treatment and subsequently via an emailed link at three days, one week, four weeks, and twelve weeks after treatment. Cognitive interviewing of a sample of patients was conducted in order to iteratively revise and improve the demographic, pain history, and running-related items.

Data analysis and interpretation: Mean scores and standard deviations will be calculated for the individual questionnaires at each time point, stratifying by age, gender, running practices and injury location. Outcome measure scores will be compared over time using chi-squared, t-tests, and regression models and assessed for both statistical and clinical significance using published minimal clinically important difference (MCID) values.

References:

1. Kalichman L, Vulfsons S. Dry needling in the management of musculoskeletal pain. J Am Board Fam Med. 2010 Sep-Oct;23(5):640-6.
2. Morihisa R, Eskew J, McNamara A, Young J. Dry needling in subjects with muscular trigger points in the lower quarter: a systematic review. Int J Sports Phys Ther. 2016 Feb;11(1):1-14.