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A pilot study of myofascial release therapy compared to Swedish massage in Fibromyalgia

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Summary Fibromyalgia (FM) is characterized by widespread muscle pain and soft tissue tenderness. However, a lack of definitive muscle pathology has made FM both a diagnostic and a treatment puzzle. Much of the evidence for pathology in FM lies in the central nervous system — in particular abnormal amplification of pain signals in the spinal cord — a manifestation of central sensitization. An emerging body of evidence posits that peripheral pain generated from the muscles and fascia may trigger and maintain central sensitization in FM.

Since FM patients so frequently seek manual therapy to relieve muscle symptoms, the present study compared two different manual therapy techniques in a parallel study of women with FM. Eight subjects received myofascial release (MFR) while four subjects received Swedish massage, 90 min weekly for four weeks. Overall symptom burden and physical function were assessed by the Fibromyalgia Impact Questionnaire Revised (FIQ-R).

A unique challenge for the manual therapist in treating conditions involving central sensitization is to determine if localized pain reduction can be achieved with targeted therapy in the context of ongoing widespread pain. Localized pain improvement was measured by a novel questionnaire developed for this study, the modified Nordic Musculoskeletal Questionnaire (NMQ).

Between-group differences in FIQ-R did not reach statistical significance, but the total change scores on FIQ-R for the MFR group (mean = 10.14, SD = 16.2) trended in the hypothesized and positive direction compared to the Swedish massage group (mean = 0.33, SD = 4.93) yielding a positive Aikin separation test. Although overall modified NMQ scores improved in both groups

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there were no consistent focal areas of improvement for the Swedish massage group. In contrast, the MFR group reported consistent pain reductions in the neck and upper back regions on the NMQ. These data support the need for larger randomized controlled trials of MFR versus other massage techniques and support the assessment of localized pain reduction in future manual therapy studies in FM.

Background/significance

Fibromyalgia (FM) is a syndrome of widespread muscle pain and fatigue that affects between 2 and 3 percent of the U.S. population, with similar numbers worldwide (Lawrence et al., 1998; White et al., 1999; Wolfe et al., 1995). FM is defined as a self-report of at least three consecutive months of widespread musculoskeletal pain, with tenderness at a minimum of 11 of 18 specific soft tissue tender points on physical examination as established diagnostic criteria (Wolfe et al., 1990). Although FM is characterized by muscle pain, the preponderance of evidence to date points to pathology in the central nervous system. In particular, three decades of research has demonstrated augmentation of pain processing in FM (Gracely et al., 2002; Staud et al., 2004; Jensen et al., 2009; Robinson et al., 2011). This exaggerated nervous system response to pain is a phenomenon termed 'central sensitization'. Central sensitization occurs when there is persistent peripheral nociceptive input leading to an increased excitability of the dorsal horn neurons of the spinal cord. There is persuasive evidence that chronic pain repetitively activates both A-delta and C fibers, which stimulate the release of neurotransmitters and neuromodulators such as substance P, nerve growth factor, glutamate and calcitonin gene-related peptide (Urban and Gebhart, 1999). These neurochemicals sensitize neurons in such a manner that they become hyperexcitable and respond inappropriately to low/normal levels of stimulation.

However, in an illness whose primary complaint is muscle pain, the muscles cannot be ignored. In fact, muscle may play a key role in triggering the central nervous system sensitivity observed in FM (Staud, 2011). An emerging body of evidence points to peripheral pain generated from muscle and fascia as the trigger of central sensitization in FM. Myofascial trigger points are spots of exquisite muscle tenderness and hyperirritability, and FM muscles have significantly more trigger points than do healthy muscles (Alonso-Blanco et al., 2011). A recent double blind study found that myofascial trigger point injections not only relieved regional muscle symptoms but also reduced global pain sensitivity in FM subjects .The authors conclude that 'localized muscle/joint pains impact significantly on FM, probably through increased central sensitization by the peripheral input; their systematic identification and treatment are recommended' (Affaitati et al., 2011).

Reducing regional FM muscle pain through lidocaine injections has also been shown to diminish pain directly at the injection site as well as contralateral hyperalgesia and wind up, both important components of central sensitization (Staud et al., 2009). These studies indicate that targeting peripheral muscle pain generators can improve both local pain and reduce central pain sensitivity. Addressing local muscle pain is therefore an important therapeutic goal in FM.

Many FM patients already try to target muscle pain locally — manual therapies are used by 44—75% of FM patients (Barbour, 2000; Wahner-Roedler et al., 2005). The most frequently chosen technique is Swedish massage, which typically consists of moderate pressure stroking of the neck, back, legs and arms with the goal to increase circulation and promote general relaxation. Many massage styles have been examined in FM, but to date no studies have directly compared two different techniques. Two single-arm studies and six randomized controlled trials have assessed various massage techniques including Swedish massage, shiatsu, mechanical deep massage, connective tissue massage, and manual lymphatic drainage. All of these studies found short-term reduction in FM symptoms, but only one single-arm study showed long-term benefits (Kalichman, 2010).

Recently the pain-generating role of fascia in maintaining FM symptoms has been suggested, raising the possibility that manual therapies that specifically target the fascia may provide more effective FM pain reduction (Liptan, 2010). The fascia surrounding skeletal muscle is a highly innervated connective tissue. Its principal cell is the fibroblast, which regulates inflammation and tissue repair. Fibroblast activation is induced by various stimuli that occur with tissue injury. In vitro modeling reveals that repetitive mechanical straining of fibroblasts induces changes in cellular morphology and secretion of inflammatory mediators (Dodd et al., 2006). Biopsy studies have demonstrated excessive levels of collagen and inflammatory mediators in the fascia of subjects with FM (Rüster et al., 2005; Spaeth et al., 2005). These findings suggest the presence of tissue injury in FM fascia similar to that seen in repetitive strain injuries (Sharma and Maffulli, 2006).

Myofascial release therapy (MFR) is a combination of manual traction and prolonged assisted stretching maneuvers designed to break up fascial adhesions. In vitro modeling of simulated MFR on fibroblasts injured by repetitive strain resulted in normalization of cell morphology and attenuation of inflammatory responses (Meltzer et al., 2010).

Two recent studies by Castro-Sánchez and colleagues found that MFR was effective in reducing FM pain, and also provided durable pain reduction which persisted at one month and to a lesser extent at six months post-intervention (Castro-Sánchez et al., 2011a, 2011b). The present pilot study compares Swedish massage directly to MFR — a head to head comparison that has not been