

## Dry needling intramuscular therapy patient education

Dry needling intramuscular therapy is a treatment modality used by physical therapists (and other medical practitioners) for relieving persistent muscle fiber contractions found in myofascial trigger points. This treatment is based on Western biomedical research and should not be confused with the ancient practice of acupuncture. The physical examination utilized for dry needling intramuscular therapy is based only on identification of myofascial trigger points which are tender ropey bands found in muscles that may cause pain and limit range of motion. Although fine acupuncture needles are used for treatment the intention of treatment is to release these persistent muscle fiber contractions and not to restore any of the imbalances claimed to exist in acupuncture theory. The needle is manipulated in order to achieve the maximum benefit. Affected muscles can be treated repeatedly with little or no side effects. In the treatment of migraine headaches, chronic arthritic knee pain, fibromyalgia and low back pain no difference has been found by using points described in acupuncture theory as compared to using non-acupuncture points.(Fink, Karst et al. 2001; Goddard, Karibe et al. 2002; Linde, Streng et al. 2005) Myofascial trigger points are most commonly the result of the overuse of muscles over a prolonged period of time. Unfortunately for people suffering with myofascial pain many times these areas persist until treated appropriately. Appropriate treatment includes stretching (including yoga), various massage and manual therapy (joint and soft tissue manipulation and mobilization) techniques, muscle energy and positional release (interventions that incorporate neurological systems to decrease muscle activity), aerobic activity, postural exercise and dry needling.

Like many of the treatments described above dry needling has both central and peripheral mechanisms of action. Local lesions that result from the insertion of a needle stimulate a local and systemic healing response(Ma, Ma et al. 2005) and increase circulation.(Tsuchiya, Sato et al. 2007) Studies have also shown that muscle function improves by increasing flexibility and improving muscle firing patterns.(Lucas, Polus et al. 2004) Studies using functional MRI have shown changes in specific areas of the brain related to the perception of pain.(Wang, Kain et al. 2008)

### Patient selection

Myofascial trigger points may result from acute trauma or chronic disease, for example, arthritic joints, deconditioning, degenerative discs, neuropathy, radiculopathy (pinched nerves), athletic injuries and overuse. Patients with recurrent or chronic musculoskeletal pain and tenderness and muscles with ropey bands and trigger points are ideal candidates. Athletes desiring increased flexibility and decreased recovery times may also benefit. Postural problems that result from keyboarding, prolonged standing and other awkward positions may also benefit. Poor candidates for dry needling her patients with myofascial pain due to infection, general poor health and people intolerant to needling or with bleeding disorders or taking blood thinners.

### Complications and risks

The greatest concerns with dry needling are pneumothorax or puncturing a kidney or bowels resulting in infection. A review of the literature reveals that these complications are quite rare and can be avoided with a thorough understanding of anatomy. Physical therapist's complete one year of anatomy with dissection-their training in peripheral anatomy is the most complete of any medical professional.

Herbert Silver has an extensive background in the identification and treatment of myofascial trigger points. As part of his undergraduate psychology degree he began using massage as a relaxation technique. In 1979 and 1980 he went on to study various massage techniques including acupressure and deep tissue massage. At that time he also became interested in and studied acupuncture, electroacupuncture and auricular therapy. In order to improve his understanding of anatomy and physiology and the mechanisms underlying these techniques he went on to physical therapy school completing his education at Georgia State University in 1986. Since then he has worked with well-known manual therapists and sports physical therapists advancing his clinical skills and earning physical therapy board certifications through the American Physical Therapy Association in both electrophysiology and orthopedics. He has taught electrophysiological testing at Georgia State University, North Georgia College and University and the Medical College of Georgia. He has also taught orthopedics and physical modalities at Georgia State University. He is presently an adjunct instructor at Georgia State University and is completing his doctorate of science degree through Rocky Mountain University of Health Professionals. His doctoral thesis is entitled "Surface Electromyographic Changes In Muscle Activation Patterns of the Hip Abductors and Gluteal Muscles Resulting From Stretch or Dry Needling Intramuscular Therapy and Stretch of Latent Myofascial Trigger Points" and will be completed in 2008.

Fink, M., M. Karst, et al. (2001). "Non-specific effects of traditional Chinese acupuncture in osteoarthritis of the hip: a randomized controlled trial." Complementary Therapeutic Medicine **9**: 82-88. 67 people with hip arthritis received either random needle placement or actual acupuncture.118 The results showed improvement in both groups, but to the same extent

Goddard, G., H. Karibe, et al. (2002). "Acupuncture and sham acupuncture reduce muscle pain in myofascial pain patients." Journal of Orofacial Pain **16**(1): 71-6.

AIMS: To compare the effectiveness of dry needling in classically recognized acupuncture points ("acupuncture") with dry needling in skin areas not recognized as acupuncture points ("sham acupuncture") in reducing masseter muscle pain in a group of patients with myofascial pain of the jaw muscles. METHODS: Eighteen patients were randomly assigned to 1 of 2 experimental groups: Ten patients received acupuncture and 8 received sham acupuncture. A visual analog scale (VAS) was used to measure changes in masseter muscle pain evoked by mechanical stimulation of the masseter muscle before and after the experiment. RESULTS: Both groups showed a statistically significant reduction in VAS pain scores ( $P = .001$ ). Seven out of 10 acupuncture subjects had a 10 mm or greater VAS reduction in pain, while 4 out of 8 of the sham acupuncture subjects had that great a pain reduction. There was no significant difference between the 2 groups. CONCLUSION: Both acupuncture and sham acupuncture reduced pain evoked by mechanical stimulation of the masseter muscles in myofascial pain patients. However, this reduction in pain was not dependent on whether the needling was performed in

standard acupuncture points or in other areas of the skin. These results suggest that pain reduction resulting from a noxious stimulus (i.e., needling) may not be specific to the location of the stimulus as predicted by the classical acupuncture literature.

Linde, K., A. Streng, et al. (2005). "Acupuncture for patients with migraine: a randomized controlled trial." JAMA **293**(17): 2118-25.

CONTEXT: Acupuncture is widely used to prevent migraine attacks, but the available evidence of its benefit is scarce. OBJECTIVE: To investigate the effectiveness of acupuncture compared with sham acupuncture and with no acupuncture in patients with migraine. DESIGN, SETTING, AND PATIENTS: Three-group, randomized, controlled trial (April 2002-January 2003) involving 302 patients (88% women), mean (SD) age of 43 (11) years, with migraine headaches, based on International Headache Society criteria. Patients were treated at 18 outpatient centers in Germany. INTERVENTIONS: Acupuncture, sham acupuncture, or waiting list control. Acupuncture and sham acupuncture were administered by specialized physicians and consisted of 12 sessions per patient over 8 weeks. Patients completed headache diaries from 4 weeks before to 12 weeks after randomization and from week 21 to 24 after randomization. MAIN OUTCOME MEASURES: Difference in headache days of moderate or severe intensity between the 4 weeks before and weeks 9 to 12 after randomization. RESULTS: Between baseline and weeks 9 to 12, the mean (SD) number of days with headache of moderate or severe intensity decreased by 2.2 (2.7) days from a baseline of 5.2 (2.5) days in the acupuncture group compared with a decrease to 2.2 (2.7) days from a baseline of 5.0 (2.4) days in the sham acupuncture group, and by 0.8 (2.0) days from a baseline of 5.4 (3.0) days in the waiting list group. No difference was detected between the acupuncture and the sham acupuncture groups (0.0 days, 95% confidence interval, -0.7 to 0.7 days;  $P = .96$ ) while there was a difference between the acupuncture group compared with the waiting list group (1.4 days; 95% confidence interval; 0.8-2.1 days;  $P < .001$ ). The proportion of responders (reduction in headache days by at least 50%) was 51% in the acupuncture group, 53% in the sham acupuncture group, and 15% in the waiting list group. CONCLUSION: Acupuncture was no more effective than sham acupuncture in reducing migraine headaches although both interventions were more effective than a waiting list control.

Lucas, K. R., B. I. Polus, et al. (2004). "Latent myofascial trigger points: their effects on muscle activation and movement efficiency." Journal of Bodywork and Movement Therapies(8): 160-166.

Ma, Y.-T., M. Ma, et al. (2005). Biomedical Acupuncture for Pain Management: An Integrative Approach. St. Louis, MO, Elsevier, Churchill Livingstone.

Tsuchiya, M., E. F. Sato, et al. (2007). "Acupuncture enhances generation of nitric oxide and increases local circulation." Anesthesia & Analgesia **104**(2): 301-7.

Although it is widely used, the mechanisms and effects of acupuncture on pain are not completely understood. Recently, increased nitric oxide (NO) synthase activity has been found in meridians and acupoints. Because NO is a key regulator of local circulation, and because change in circulation can affect the development and persistence of pain, we propose that acupuncture might regulate NO levels. We studied the effects of acupuncture on local NO levels and circulation in a randomized, double-blind, crossover study with 20 volunteers, each of whom underwent one session each of real and noninvasive sham acupuncture in a single hand and forearm with a 1-wk interval between treatments. NO concentration in the plasma from the acupunctured arm was significantly increased by 2.8 +/- 1.5 micromol/L at 5 min and 2.5 +/- 1.4

micromol/L at 60 min after acupuncture. Blood flow in palmar subcutaneous tissue of the acupunctured arm also increased, and this correlated with the NO increase. These changes were not observed in noninvasive sham-acupunctured hands and forearms. In conclusion, acupuncture increases the NO level in treated regions and thereby increases local circulation. These regulatory effects might contribute to pain relief provided by acupuncture.

Wang, S. M., Z. N. Kain, et al. (2008). "Acupuncture analgesia: I. The scientific basis." Anesthesia & Analgesia **106**(2): 602-10.

Acupuncture has been used in China and other Asian countries for the past 3000 yr. Recently, this technique has been gaining increased popularity among physicians and patients in the United States. Even though acupuncture-induced analgesia is being used in many pain management programs in the United States, the mechanism of action remains unclear. Studies suggest that acupuncture and related techniques trigger a sequence of events that include the release of neurotransmitters, endogenous opioid-like substances, and activation of c-fos within the central nervous system. Recent developments in central nervous system imaging techniques allow scientists to better evaluate the chain of events that occur after acupuncture-induced stimulation. In this review article we examine current biophysiological and imaging studies that explore the mechanisms of acupuncture analgesia.