A RANDOMIZED CONTROLLED TRIAL OF THE EFFECTS OF INSTRUMENT-APPLIED CHIROPRACTIC MANIPULATIVE THERAPY ON MYOFASCIAL TRIGGER POINTS

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ABSTRACT

Introduction: Myofascial trigger points (MTrPs) are characterized as discrete, focal, hypersensitive spots in a taut band of muscle that are painful to palpation and reproduce the patient's local and referred pain symptoms. (Borg-Stein & Simons, 2002) Other features may include "exquisite" pain on compression, a jump and/or twitch response on compression, muscle weakness, rapid muscle fatigue, restricted range of motion (ROM) with painful stretch limit, motor dysfunction and autonomic dysfunction. (Simons et al. 1999) Incidence of myofascial pain, i.e., pain derived from MTrPs, has been reported to be as high as 93% in patients presenting to specialty pain management centers. (Gerwin 1995) Diagnosis of MTrPs is equivocal in published studies (Hsieh et al. 2000, Njoo et al. 1994) with best reliabilities associated with the combination of upper trapezius + trained examiners + spot tenderness, pain recognition and jump sign. (Gerwin 1997, Sciotti 2001) Etiologies of myofascial pain include mechanical stress, joint disorders, discogenic disorders, regional soft tissue disorders, inflammatory disorders, neurologic disorders, visceral referred pain syndromes, nutritional & metabolic conditions, psychological disorders, infectious disease, fibromyalgia and widespread chronic pain. (Simons et al. 1999) Treatment effectiveness of MTrPs is equivocal in the literature with mixed results shown for physical therapy (TENS, ultrasound, spray and stretch, etc.), pharmacotherapy (NSAIDS, antidepressants, analgesics, muscle relaxants, etc), psychological therapies (stress reduction behavior modification, cognitive-behavioral, biofeedback, etc.), stretching (active, passive, positional release, etc.), acupuncture (needle, microcurrent, laser, etc.), rehabilitation (postural, mechanical, ergonomic, etc.), injection (procaine, lidocaine, steroids, botulinum toxin, etc.) and manual therapy (transverse friction, ischemic compression, myofascial release, chiropractic manipulation, etc.). (Borg & Simons 2002) A PubMed search finds 4900 MTrPs articles since 1956, yet there is no consensus on the etiology, diagnosis or treatment of this ubiquitous pain syndrome. Few studies in the chiropractic literature have examined the effects of osseous manipulation or soft tissue manipulation on MTrPs none have investigated the combined effects of both.

Objective: To investigate the effects of combined instrument-applied osseous and soft tissue chiropractic manipulation on MTrPs.

Method: This study was approved by the Logan College of Chiropractic (LCC) Institutional Review Board. Design: This was a randomized clinical trial (RTC) to investigate three hypotheses: 1. Post treatment (Tx) MTrPs would be significantly less ($p < .05$) than pre Tx MTrPs; 2. Post Tx MTrPs would be

significantly less ($p < .05$) than post control MTrPs; 3. Control pre MTrPs would not be significantly different than post control MTrPs ($p > .05$); 4. Inter examiner kappas (k) would be > .61. Participants: One hundred seventeen consenting normal volunteers were screened by inclusion criteria of student at LCC, 18-50 years of age (yoa), two examiners (masked) agree on location of "the worst" active MTrP in upper trapezius; and exclusionary criteria of systemic illness, skin or other malignancy, local infection or injury, manipulation within 48 hours and analgesic or muscle relaxant use within 48 hours. Screening continued until 80 qualified participants were identified (49 male, 31 female, mean age 26.7 yoa). Examiners: Two senior interns were trained in manual palpation of MTrPs. Treating physician: A licensed DC with certification and 8 years of experience with the Pro-Adjuster System (PAS) percussion instrument. Procedure: 1. Participants are randomly assigned to treatment or control condition. 2 Treating physician performs PAS scan on cervical spine. 3. Treating physician is informed of MTrP location by marked drawing. 4. MTrPs are treated with PAS protocol of cervical manipulation and soft tissue manipulation. 5. Controls receive 5 minutes seated rest. 6. Examiners masked to participant status perform MTrP evaluation. Data analysis: Examiner pre and post MTrP findings were analyzed by kappa statistic for examiner agreement and Z-score transformed Mann-Whitney tests for pre-post differences.

Results: All data sets were complete with no drop-outs. All four hypotheses were supported: 1. MTrPs post < MTrPs pre ($p < .001$). 2. MTrPs post Tx < post control ($p < .001$). 3. Control MTrPs pre + MTrPs post ($p > .05$) 4. Inter examiner agreements for MTrP location were > .61, (> .61 < .80 is considered substantial agreement): all screened $k = .73$; post Tx $k = .82$; post control $k = .77$.

Conclusion: In this investigation, a single treatment of instrument-applied (Pro-Adjuster System) cervical manipulation combined with instrument applied soft-tissue manipulation significantly reduced upper trapezius MTrPs in the treatment group, while controls had no change. These preliminary results warrant continued study with repeated measures designs and symptomatic participants.

Key Words: Trigger Points, Myofascial Trigger Points, Myofascial Pain, Chiropractic Manipulative Therapy, Inter Rater Reliability Reliability,

References: (Limit 5)

1. Borg-Stein J, Simons DG. Focused review: myofascial pain. Arch Phys Med Rehabil. 2002;83(3Suppl 1): S40-7, S48-9.
2. Gerwin R. A study of 96 subjects examined both for fibromyalgia and myofascial pain. J musculoskel pain 3(Suppl 1):121, 1995.
3. Hsieh C, Hong C, Adams A, et al. Interexaminer reliability of the palpation of trigger points in the trunk and lower limb muscles. Arch Phys Med Rehabil. 2000; 81: 258-64
4. Njoo K, Van der Does E. The occurrence and inter-rater reliability of myofascial trigger points in the quadratus lumborum and gluteus madius: a prospective study in non-specific low back pain patients and controls in general practice. Pain 1994;58:317-323

5. Simons D, Travell J. Myofascial pain and dysfunction: the trigger point manual. Vol 1, upper half of body. 2nd ed. Baltimore: Williams & Wilkins: 1999.