

The Somatic Connection

“The Somatic Connection” highlights and summarizes important contributions to the growing body of literature on the musculoskeletal system’s role in health and disease. This section of *The Journal of the American Osteopathic Association (JAOA)* strives to chronicle the significant increase in published research on manipulative methods and treatments in the United States and the renewed interest in manual medicine internationally, especially in Europe.

To submit scientific reports for possible inclusion in “The Somatic Connection,” readers are encouraged to contact *JAOA* Associate Editor Michael A. Seffinger, DO (mseffinger@westernu.edu), or *JAOA* Editorial Advisory Board Member Hollis H. King, DO, PhD (hhkingdo@gmail.com).

Myofascial Release Increases Effectiveness in Management of Chronic Low Back Pain

Ajimsha MS, Daniel B, Chithra S. Effectiveness of myofascial release in the management of chronic low back pain in nursing professionals. *J Bodyw Mov Ther.* 2014;18(2):273-281. doi:10.1016/j.jbmt.2013.05.007.

Myofascial release (MFR) is one of the more frequently applied and studied osteopathic manipulative treatment techniques. A recently published study by Ajimsha et al showed that specific back exercise plus MFR manual therapy was more effective than specific back exercise plus sham therapy in the management of chronic low back pain. In the study, carried out in India, 80 nursing professionals aged 20 to 40 years who had a primary diagnosis of chronic low back pain (low back pain \geq 3 months) were recruited. Exclusion criteria were conditions possibly adversely affected by MFR.

Outcome measures included scores on the Pain Rating Index, as determined using the McGill Pain Questionnaire, and the Quebec Back Pain Disability Scale, which measures one’s ability to perform activities of daily living. Measures were taken at baseline, 8 weeks, and 12 weeks after the first intervention.

Participants were randomly assigned to 1 of 2 groups: an MFR group or a sham MFR group

(ie, control group). Participants received an MFR protocol or a sham MFR protocol, as well as specific back exercises for chronic low back pain, 3 times per week for 8 weeks. Each session was 60 minutes in duration, with 40 minutes allocated for the intervention and 20 minutes allocated for specific back exercises. All participants watched the same 15-minute video that oriented them to the specific back exercise program.

On the basis of the authors’ descriptions, the MFR used in the study appeared to be slightly more firm than that usually administered by osteopathic physicians. Specifically, longer durations of firm elbow, hand, and finger pressure were applied. For the sham MFR in the control group, the same areas of the body were contacted for the same amount of time, with the therapist gently placing his or her hand over the same areas to which manual therapy was applied in the MFR group.

Results showed that outcome measures in both groups were comparable at baseline. At 8 weeks, outcomes in both groups had improved, but the MFR group showed statistically significantly more improvement on both outcome measures. Beneficial effects were also present at 12 weeks (4 weeks after intervention ceased).

This study showed “light touch” to be an effective sham therapy. However, in osteopathic research, light touch has been shown to have effects.¹ I believe the difference in outcomes is a result of the way osteopathic palpatory skills and manipulative treatment are taught and applied. Osteopathic manipulative treatment curriculum emphasizes observing continuous palpatory feedback as one assesses musculoskeletal structures. Mentally, the osteopathic physician cannot help but be aware of, and respond to, the quality of the tissues contacted. This perceptive response, coupled with the body-mind-spirit aspect of osteopathic medical philosophy that further heightens awareness, probably conveys nonspecific effects when applied in research protocols. (doi:10.7556/jaoa.2014.113)

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Lymphatic Pump OMT Releases Cytokines Into Central Circulation

Schander A, Padro D, King HH, Downey HF, Hodge LM.

Lymphatic pump treatment repeatedly enhances the lymphatic and immune systems. *Lymphat Res Biol*. 2013;11(4):219-226.

doi:10.1089/lrb.2012.0021.

Researchers at the University of North Texas Health Science Center Texas College of Osteopathic Medicine have been investigating lymph flow related to osteopathic manipulative treatment in animal models for several years.¹⁻⁴ In a recent study, approved by the Institutional Animal Care and Use Committee, these researchers studied the effects of repeated lymphatic pump technique (LPT) treatments on the lymphatic and immune systems of 5 healthy, adult mongrel dogs.

For the study protocol, the dogs were anesthetized and intubated. A catheter was inserted into the thoracic duct to monitor thoracic duct lymph flow and leukocyte flux during abdominal LPT administration. A trained osteopathic medical student performed LPT by placing the dog in the right lateral recumbent position and applying a medial and cranial compression to the ventral abdomen just above the costodiaphragmatic junction. Abdomen compression was applied until substantial resistance against the diaphragm was perceived, at which time the pressure was released. Thoracic duct lymph samples were collected 4 minutes before initiation of LPT treatment, during the 4-minute LPT session, and 10 and 86 minutes after cessation of LPT treatment. Two hours after the first LPT session, the protocol was repeated. Investigators measured, analyzed, and compared thoracic duct lymph flow, thoracic duct lymph leukocyte concentrations, lymphatic flux of leukocytes, and immune mediators during the initial and repeated LPT protocols.

Repeated LPT treatment was found to mobilize leukocytes and other immune factors from an abdominal reservoir sensitive to the LPT. The initial 4-minute LPT treatment session depleted the reservoir; however, the lymph was replenished 2 hours after treatment. The second LPT session effectively remobilized the lymph, releasing an increased amount of leukocytes into circulation. The thoracic duct lymph flux of superoxide dismutase, an antioxidant enzyme, and nitrite, a precursor to the vasodilator nitric oxide, were both increased by the first and second LPT sessions. The thoracic duct lymph flux of cytokine and chemokine release was quantified by measuring interleukin-6, interleukin-8, and keratinocyte chemoattractant. All 3 acute inflammatory mediators were increased by the first and second LPT sessions. The increase in flux of these leukocytes and immune factors from thoracic duct lymph increased their mobilization into central lymphatic circulation.

The authors of the study provide a scientific foundation for the use of repeated LPT treatment to

enhance healthy lymphatic and immune systems. In addition, the findings of this study provide a lucrative *in vivo* model for future studies of lymph flow on disease processes. This study encourages a more aggressive and consistent approach to the management of infection and edema using LPT treatment. (doi:10.7556/jaoa.2014.114)

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Patients With Magnetic Resonance Imaging–Verified Lumbar Disk Herniations Benefit From Chiropractic High-Velocity, Low-Amplitude Spinal Manipulative Therapy

Leeman S, Peterson CK, Schmid C, Anklin B, Humphreys BK. Outcomes of acute and chronic patients with magnetic resonance imaging–confirmed symptomatic lumbar disc herniations receiving high-velocity, low-amplitude, spinal manipulative therapy: a prospective observational cohort study with one-year follow-up [published online March 11, 2014]. *J Manipulative Physiol Ther*. 2014;37(3):155-163. doi:10.1016/j.jmpt.2013.12.011.

Swiss chiropractic researchers carried out a prospective cohort study of patients with magnetic

resonance imaging–verified lumbar disk herniation (LDH) with accompanying physical symptoms using high-velocity, low-amplitude spinal manipulative therapy (SMT). Three chiropractors in the same office affiliated with a university chiropractic medicine program followed specific SMT procedures depending on whether the herniation was intraforaminal or paramedian. A total of 148 patients, aged 18 to 65 years, were enrolled in the study.

In addition to LDH, inclusion criteria were back pain, leg pain, or both, and 1 or more of the following: decreased straight-leg raising, deficit in detection of cold, reduced response to pinprick, decreased muscle strength in a corresponding myotome, or decreased or absent deep tendon reflex. Patients were excluded if they had tumors, infections, inflammatory spondylarthropathies, acute fractures, Paget disease, severe osteoporosis, body mass index greater than 30, or neurogenic claudication.

Primary outcome measures were a numeric rating scale, with 0 indicating no pain and 10 indicating worst pain imaginable; the Oswestry pain and disability questionnaire; and the patient’s global impression of change, measured on a scale ranging from “much worse” to “much better.” All data were collected at baseline and at 2 weeks, 1 month, 3 months, 6 months, and 1 year after intervention was initiated.

The SMT procedures—which, on the basis of the authors’ description, did not resemble procedures used by osteopathic physicians—included a chiropractic drop table procedure, which was performed with paramedian LDH patients lying on their unaffected side and intraforaminal LDH patients lying on their affected side. The mean number of SMT procedures applied per patient in the first month of data collection was 11.20.

Statistically significant progressive improvement was noted from the 2-week through the 1-year data points for the numeric rating scale and Oswestry questionnaire. On the patient’s global impression of change scale, 80% of patients with acute pain (<12 weeks) and 47% of patients with chronic pain (>12 weeks) reported feeling much better at 2 weeks. By 1 year, 86% of patients with acute pain and 89% of patients with chronic pain

reported feeling better. These findings for the chronic pain patients are surprising, as the natural history for chronic pain patients with sciatica has been found to be 80% improvement at 1 year.¹

The authors point out that because of the study's design, the reported benefits cannot be attributed to SMT. In addition, follow-up magnetic resonance imaging data were not obtained. This study was selected for review because it describes the apparently successful application of high-velocity, low-amplitude SMT in patients with magnetic resonance imaging-verified LDH without any adverse events. These findings add to the body of evidence that manual therapy is a safe and effective treatment for patients with spine conditions. (doi:10.7556/jaoa.2014.115)

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Chiropractic Treatment of Pregnant Patients Supports Reduction in Low Back Pain

Peterson CK, Mühlemann D, Humphreys BK. Outcomes of pregnant patients with low back pain undergoing chiropractic treatment: a prospective cohort study with short term, medium term and 1 year follow-up. *Chiropractic Man Ther*. 2014;22:15.

Women receiving osteopathic manipulative treatment during their third trimester of pregnancy have been shown to have statistically significantly less functional deterioration and less back pain than women receiving standard obstetrical care and standard care plus sham ultrasound.¹ Expanding on this body of research on manual therapy for pregnant women, Swiss researchers recently conducted a prospective cohort study to assess reports of low back pain in pregnant women receiving chiropractic treatment.

Of 143 recruited pregnant patients, 115 completed the yearlong study. Patients were included if they were aged 18 years or older, had a history of

low back pain, pelvic pain, or both, and had not received chiropractic or manual therapy in the previous 3 months. Patients were excluded if they had a history of tumors, infections, inflammatory spondylarthropathies, acute fractures, Paget disease, or severe osteoporosis. Patients were recruited from the practices of 15 different chiropractors. Chiropractic treatment was not standardized and included methods at the discretion of the provider. However, the authors noted that high-velocity, low-amplitude spinal manipulative therapy is the most common method used by chiropractors in Switzerland.

Primary outcome measures were a numeric rating scale, with 0 indicating no pain and 10 indicating worst pain imaginable, and the Oswestry pain and disability questionnaire. Also collected was the patient's global impression of change, rated on a scale ranging from "much worse" to "much better." All data were collected at baseline and 1 week, 1 month, 3 months, 6 months, and 1 year after the initiation of treatment.

Results showed statistically significant progressive reductions in pain from baseline at every follow-up point for the numeric rating scale and Oswestry questionnaire. On the patient's global impression of change scale, patients reported progressively feeling "better" to "much better" at each data collection point. The authors point out that because this study was not a randomized controlled trial, the reported reductions in pain and reports of feeling much better could be attributed to factors other than the chiropractic treatment. However, they note that these results are very similar to a recent randomized controlled trial that showed similar levels of improvement and reduced pain.²

This study was selected for review because its design has elements that could be used in prenatal osteopathic manipulative treatment research and because it shows another professions' approach to using manual therapy in pregnant patients. (doi:10.7556/jaoa.2014.116)

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Short-Term Effects of a Manual Therapy Protocol on Pain and Functioning in Patients With Fibromyalgia

Castro-Sánchez AM, Aguilar-Ferrández ME, Matarán-Peñarocha GA, Sánchez-Joya MD, Arroyo-Morales M, Fernández-de-Las-Peñas C. Short-term effects of a manual therapy protocol on pain, physical function, quality of sleep, depressive symptoms and pressure sensitivity in women and men with fibromyalgia syndrome: a randomized controlled trial [published online November 25, 2013]. *Clin J Pain.* doi:10.1097/AJP.000000000000008.

Fibromyalgia syndrome (FMS) is a chronic musculoskeletal pain condition affecting up to 2% of the US population.¹ Patients with FMS experience a constellation of symptoms including fatigue, sleep disturbance, musculoskeletal pain, and depression.² In a randomized controlled trial, researchers from Spain set out to compare the effect of manual therapy with that of no intervention in 89 adult patients with FMS. Outcome measures included patients' pressure pain threshold and patients' self-reported scores on the McGill Pain Questionnaire, the Fibromyalgia Impact Questionnaire, the Pittsburgh Quality of Sleep Questionnaire Index, and the Center for Epidemiologic Studies Depression Scale.

Participants in the experimental group (24 women and 21 men; mean age, 54 years) received 5 weekly 45-minute sessions of manual therapy, whereas those in the control group (24 women and 20 men; mean age, 53 years) did not receive any intervention. The manual therapy protocol included the following techniques: suboccipital release, re-

lease of the pectoral region, diaphragm release, lumbosacral decompression, release of the psoas fascia, and thoracic spine extension manipulation (high-velocity, low-amplitude).

A 2 × 2 analysis of covariance revealed statistically significant improvements after 5 weeks in widespread pressure sensitivity, pain, impact of FMS symptoms, tender point count, sleep quality, and depressive symptoms for participants in the experimental group compared with those in the control group. Differences in men's and women's response to treatment were also found: men had a greater reduction in depressive symptoms and pressure hypersensitivity, and women had a greater reduction in pain and impact of FMS symptoms.

The results of this study show promising improvement in patients with FMS receiving manual therapies and demonstrate the need for further research in this area. (doi:10.7556/jaoa.2014.117)

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Headaches Are a Pain in the Neck

Espí-López GV, Rodríguez-Blanco C, Oliva-Pascual-Vaca A, Benítez-Martínez JC, Lluch-Girbés E, Falla D. The effect of manual therapy techniques on headache disability in patients with tension-type headache [published online April 30, 2014]. *Eur J of Phys Rehabil Med.* <http://www.minervamedica.it/en/journals/europa-medicophysica/article.php?cod=R33Y9999N00A140321>. Accessed May 30, 2014.

Cervical manipulation has been found to be effective in reducing the frequency, duration, and intensity of pain in patients with tension-type headache.¹ In addition, the application of soft tissue techniques has been shown to influence cervical muscle relax-

ation by decreasing the frequency and intensity of pain.² Espi-López et al conducted a factorial, randomized controlled trial to establish the effectiveness of applying single and combined manual therapies on patients with episodic and chronic tension-type headaches.

Seventy-six patients (62 women, 14 men; mean [standard deviation] age, 39.9 [10.9] years) with diagnosed episodic tension-type headache or chronic tension-type headache were recruited from different neurology clinics. Inclusion criteria were 3 or more months' history of headache episodes lasting 30 minutes to 7 days with 2 or more of the following: bilateral pain, pressing nonpulsatile pain, mild to moderate pain, or pain not aggravated by physical activity. Patients were allocated to a control group or 1 of 3 treatment groups using a computer-generated randomization sequence. The first treatment group received suboccipital soft tissue inhibition (SI), the second group received occiput-atlas-axis (OAA) manipulation, and the third group received a combination of the SI and OAA techniques. All participants received 4 weekly sessions of their assigned intervention.

Two therapists with more than 10 years of experience in manual therapy were trained to apply the techniques. Patients were in the supine position for all interventions. For the SI therapy, the therapist placed his or her hands under the suboccipital musculature in the region of the posterior arch of the atlas. Pressure was progressively and deeply applied and maintained for 10 minutes. The OAA manipulation was conducted bilaterally along a vertical axis in 2 stages: first, the therapist applied cephalic decompression and subsequent cephalic circumduction before engaging the joint barrier; second, the therapist initiated rotation with a helical movement toward the selected side. After manual therapy was applied, the patient was placed with his or her head and neck in a neutral position for 5 minutes. Participants in the control group rested in the supine position for 10 minutes and did not receive manual therapy.

The investigators assessed patients' pre- and posttreatment pain severity and frequency, as well

as functional and emotional subscale scores, using the Headache Disability Inventory. Among all patients, 40.8% had tension-type headache and 59.2% had episodic tension-type headache. Patients in the OAA and combined groups had statistically significant reductions in headache frequency ($P < .05$), and the SI, OAA, and combined groups had statistically significant reductions in headache severity ($P < .05$). No statistically significant changes were noted for pain severity or frequency in the control group. Combined treatment yielded the greatest effect size for improvement in the functional subscale score and for reductions in pericranial tenderness, photophobia, and phonophobia.

Overall, combined manual therapy procedures with SI and OAA manipulation yielded the most benefit for patients with episodic and chronic tension-type headaches. Future studies of other techniques such as frontal and parietal lifts may further benefit patients with tension-type headaches.

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