

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 (mseffingerdo@osteopathic.org), or *JAOA* Editorial Advisory Board Member Hollis H. King, DO, PhD (hollis.king@famned.wisc.edu).

Manual Therapy Maneuvers for Cervical Spine Do Not Affect Blood Flow to the Brain

Thomas LC, Rivett DA, Bateman G, Stanwell P, Levi CR.
Effect of selected manual therapy interventions for mechanical neck pain on vertebral and internal carotid arterial blood flow and cerebral inflow [published online June 27, 2013]. *Phys Ther*. doi:10.2522/ptj.20120477.

Manipulation of the cervical spine is rarely associated with serious adverse events involving compromise of the vertebral or internal carotid arteries. A search of the scientific literature, however, yields case studies and case series about patients who had strokes allegedly after receiving cervical manipulation performed by a health care professional.^{1,2} Although laboratory studies have used ultrasonography to show that certain neck positions can alter vertebral and basilar arterial blood flow velocities, the clinical correlations of these findings have not been proven.³⁻⁶ Using magnetic resonance (MR) angiography, Australian researchers Thomas et al sought to examine the effects of selected manual therapy techniques used for mechanical neck pain on blood supply to the brain.

Twenty healthy adult participants (10 men and 10 women; mean [SD] age, 33 [11.9] years [range,

18-65 years]) underwent 3-T MR angiography with their necks in the following positions: neutral, rotation, rotation/distraction, C1-C2 rotation, and distraction. No statistically significant changes in blood flow to the brain were found for any position, and no individual differences were found in blood flow between participants. In addition, the researchers did not find statistically significant differences in blood flow in any of the 4 cervical arteries for any position from neutral in participants. Each participant had normal anatomic structures. Of note, because this study used only healthy asymptomatic participants and investigated only a short section of the arteries, the results may not be applicable to clinical practice (ie, because of poor external validity).

To limit the risks to participants in the study, volunteers were excluded if they reported any of the following: diagnosed inflammatory joint disease, history of serious cervical spine trauma (eg, fracture), any congenital disorder associated with hypermobility or instability of the upper cervical spine, diagnosed vertebrobasilar artery insufficiency (VBI), claustrophobia or discomfort in confined spaces (a standard contraindication for MR imaging), or any contraindication identified by an MR imaging safety screening questionnaire.

In accordance with Australian Physiotherapy Association guidelines, all participants were assessed for cervical range of motion and tested for VBI prior to MR imaging examination. Participants who exhibited potential symptoms of VBI were excluded from the study; because of the sustained neck positions required for the study, these patients would have been at risk for brain ischemia.

Blood flow to the brain does not appear to be compromised by positions commonly used in manual therapy. The next phase of this study would be to use symptomatic patients and to perform the manual procedures indicated by the clinical findings. Additionally, high-velocity, low-amplitude or spinal manipulative therapy should be employed to determine if these more forceful procedures cause any blood flow differences. (doi:10.7556/jaoa.2013.049)

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Quantifying Lack of Interexaminer Reliability

Vorro J, Bush TR, Rutledge B, Li M. Kinematic measures during a clinical diagnostic technique for human neck disorder: inter- and intraexaminer comparisons [published online February 16, 2013]. *BioMed Research Int.* doi:10.1155/2013/950719.

It is well known that interexaminer reliability is generally poor when it comes to diagnosing cervical somatic dysfunction using passive motion testing. Researchers at Michigan State University College of Osteopathic Medicine objectively measured cervical spine kinematics to determine why there is such variability in these findings with use of the standard manual osteopathic structural examination. This study, supported by funds from the American Osteopathic Association and the Osteopathic Heritage Foundation, sought to measure cervical spine kinematics using multiangle videography while experienced osteopathic physicians (ie, with 10 years of experience in osteopathic manipulative medicine) performed osteopathic manual diagnosis of somatic dysfunction in symptomatic volunteers with neck pain and in asymptomatic volunteers.

Forty-one volunteers participated in the study: 22 in the control group (mean [SD] age, 19.9 [1.9] years; 16 male, 4 female, 2 no response) and 19 in the experimental group (mean [SD] age, 27.5 [13.1] years; 14 male, 5 female). Volunteers in the control group were asymptomatic (ie, pain free) and had symmetrical findings on passive cervical lateral flexion (sidebending) motion tests as performed by a blinded, experienced examiner. Asymptomatic volunteers who had asymmetrical findings were excluded from the study. Volunteers in the experimental group reported a cervical pain score of 3 or higher on a 0- to 10-point visual analog scale. Blinded second and third experienced examiners performed the passive cervical range of motion (ROM) tests on participants in both study groups. Video kinematics assessed cervical ROM in lateral flexion, secondary rotations around the primary diagnostic motion of lateral flexion, and angular velocities.

Diagnostic cervical ROMs and secondary rotations were consistent for each examiner between tri-

als for each study group, validating that examiners are reliable in gathering the same data repeatedly. In contrast, interexaminer comparisons for diagnostic cervical ROMs, secondary rotations, and average velocities yielded consistently larger measures for 1 examiner for both study groups ($P < .05$). This finding indicates that each examiner differs in how he or she examines a patient. Specifically, this study was able to quantify exactly how the 2 examiners differed. These objective data could potentially be applied to clinical decision making and could explain why 2 physicians may disagree on the diagnosis and treatment plan for the same patient. (doi:10.7556/jaoa.2013.050)

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Section Editor's Note: The osteopathic medical profession has progressed slowly in generating the evidence base for osteopathic manipulative treatment (OMT). Since the establishment of the Osteopathic Research Center at the University of North Texas Health Science Center in 2001, its current executive director, John C. Licciardone, DO, MS, MBA, authored a systematic review and meta-analysis showing the benefit of OMT in the management of low back pain (*BMC Musculoskeletal Disord.* 2005;6:43). In the following 3 reviews, I look at OMT research from health care professionals outside the osteopathic medical profession. This research reflects the current state OMT research and the issues facing osteopathic researchers.—H.H.K.

Don't Throw the Baby Out With the Bath Water

Posadzki P, Lee MS, Ernst E. Osteopathic manipulative treatment for pediatric conditions: a systematic review [published online June 17, 2013]. *Pediatrics.* 2013;132(1):140-152. doi:10.1542/peds.2012-3959

The recently published systematic review by Posadzki et al gives a sobering but flawed view of the application of osteopathic manipulative treatment (OMT) in pediatric health care. It is sobering because there are so few studies on this topic, and those that have been published are really only pilot or preliminary studies. It is flawed because these

studies, when looked at as a whole, give a mixed picture of the benefit of OMT in pediatric care.

The article by Posadzki et al was published by a major pediatric journal and, along with the accompanying publicity, painted an inordinately negative picture of OMT use in pediatrics. The authors concluded, "OMT cannot be regarded as an effective therapy for pediatric conditions, and osteopaths should not claim otherwise." In addition, 1 of the authors was quoted by Reuters Health news service as saying, "I think the onus is on osteopaths to show that their claims are not bogus."¹ To me, this language—from supposedly objective researchers—is hostile and inflammatory and represents a certain attitude that osteopathic researchers seem to be facing in the medical scientific community at large.

The authors searched the literature up to November 2012. Only randomized controlled trials were included. They identified 17 trials originating from Belgium, Germany, Italy, Spain, Switzerland, the United Kingdom, and the United States that included terms such as OMT, osteopathic treatment, osteopathy, osteopathic technique, and even osteopathic-based manual physical therapy in the titles.

The authors cited "low methodological quality and paucity of the primary studies" as a factor in reaching their conclusions. I do not disagree with this general conclusion. However, this systematic review is misleading to the medical scientific community and—more importantly—to the general public on several grounds.

First, there seemed to be a mixture of apples and oranges. Although the authors described the differences between US-trained osteopathic physicians and nonphysician foreign-trained osteopaths, they grouped research from both traditions of health care without distinction. The use of osteopathic manual therapy may not be standardized in each country and could therefore lead to inaccurate comparisons, a consideration that the authors did not address. In addition, 4 of the randomized controlled trials reviewed had nonosteopaths as the lead authors, and 2 trials were published only as abstracts, further raising questions about the authors' conclusions.

Second, as I point out in my letter to the editor² in response to the article, the benefit of OMT in pediatric care has been demonstrated in numerous case control and cohort studies,³⁻⁵ as well as in everyday clinical practice. Furthermore, the standard of practice of osteopathic medicine in the United States is of the highest quality, ensuring public safety in the use of OMT for all patients, including children. (doi:10.7556/jaoa.2013.051)

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Systematic Review of OMTh for Lower Urinary Tract Symptoms in Women Shows Benefit

Franke H, Hoesele K. Osteopathic manipulative treatment (OMT) for lower urinary tract symptoms (LUTS) in women [published online June 17, 2012]. *J Bodyw Mov Ther*. 2013;17(1):11-18. doi:10.1016/j.jbmt.2012.05.001.

In a systematic review, German authors Franke and Hoesele assessed studies on osteopathic manipulative therapy (OMTh) for women with lower urinary tract symptoms (LUTS). All 5 of the studies included in the systematic review were published in

German, making them difficult to critique in great detail. My clinical experience in treating women with LUTS, however, has been positive and consistent with the details reported by the authors. Also, I have attended research conferences in Germany and other parts of Europe, where I interacted with some of the researchers cited in this study and with other well-published German osteopathic researchers. My interactions with these individuals lead me to feel confident in the quality of the research reported in this systematic review.

Each study had an experimental group of 24 to 45 participants who received OMTh and a control group of 23 to 45 participants who received either no treatment or pelvic floor muscle training. The OMTh was fairly consistent between studies and included visceral techniques to the bladder and pelvic diaphragm release. Techniques directed at the pelvis and axial skeleton included muscle energy, counter-strain, cranial, and balanced ligamentous tension; no techniques were found to be more effective than the others. The number of OMTh administrations per study ranged from 3 to 5 during a period ranging from 4 to 12 weeks.

All 5 studies had statistically significant outcomes based on standard LUTS questionnaires used in urologic research. Using meta-analysis, the authors found statistically significant improvements in women in the OMTh groups compared with women in the no-treatment groups. Improvement in women in the OMTh groups was similar to that of women in the pelvic floor muscle training groups.

The authors concluded that although further research is needed on which OMTh techniques might be most beneficial, OMTh should be considered in the treatment of patients with LUTS. Use of OMTh and osteopathic manipulative treatment for LUTS has much to offer in women's health, including prenatal care and pelvic pain management. (doi:10.7556/jaoa.2013.052)

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Systematic Review of CAM Approaches to Otitis Media: The Otolaryngology Perspective

Levi JP, Brody RM, McKee-Cole K, Pribitkin E, O'Reilly R. Complementary and alternative medicine for pediatric otitis media [published online April 4, 2013]. *Int J Pediatr Otorhinolaryngol*. 2013;77(6):926-931. doi:10.1016/j.ijporl.2013.03.009.

This review on complementary and alternative medicine for pediatric otitis media by Levi et al was chosen for inclusion in “The Somatic Connection” because it looked at osteopathic manipulative treatment (OMT). This review illustrates the context within which osteopathic research is often viewed. Although most osteopathic physicians who use OMT to treat patients with otitis media have had clinical success, research has produced mixed findings. This review suggests that, compared with other complementary and alternative medicine approaches, we are not alone in the struggle to demonstrate efficacy in our approach to health care.

Included in the review were case reports, case series, randomized controlled trials (RCTs), and basic science research articles on pediatric otitis media that used interventions including homeopathy, natural health products and probiotics, osteopathic and chiropractic manual therapy, and traditional Chinese and Japanese medicine.

The only complementary and alternative medicine approach found to have strong RCTs demonstrating evidence of benefit for pediatric otitis media was xylitol, a natural sugar found in many fruits and used as a sweetener in chewing gum. All other substances, including the familiar Echinacea, and modalities including OMT were not found to be of reliable benefit. The authors' discussion of OMT was limited to the Mills et al (2003)¹ and Degenhardt and Kuchera (2006)² studies, which were found to be flawed because of high dropout rates and lack of controls. Interestingly, these authors reported specifically on the use of the “Galbreath maneuver”³ and the “Muncie technique.”⁴

The authors concluded that herbal eardrops may relieve symptoms and homeopathic remedies may

decrease pain and result in faster resolution of this disorder. The authors end with the admonition to consult a physician when making treatment decisions for pediatric patients with otitis media.

On the basis of these findings, the challenge for the osteopathic medical profession is apparent. We need to develop better-designed RCTs and fully address the concern for the safety of OMT. My opinion is that we have proven the benefit of OMT in musculoskeletal disorders. Next, we need to develop and fund well-designed studies that demonstrate the benefit of OMT in physiologic functions and systematic disorders such as otitis media,¹ asthma,⁵ pneumonia,⁶ and pregnancy.⁷ (doi:10.7556/jaoa.2013.053)

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