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Editorial Staff

Editor's note: Due to space constraints, not all abstracts from the September 2006 issue of *JMPT* are reprinted below. To review the complete table of contents from the September issue, please visit www.mosby.com/jmpt.

Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial.

Raquel Martínez-Segura, PT, DO, César Fernández-de-las-Peñas, PT, Mariana Ruiz-Sáez, PT, CO, Cristina López-Jiménez, PT, DO, Cleofás Rodríguez-Blanco, PT, DO

Purpose: The objective of this study was to analyze the immediate effects on neck pain and active cervical range of motion after a single cervical high-velocity low-amplitude (HVLA) manipulation or a control mobilization procedure in mechanical neck pain subjects. In addition, we assessed the possible correlation between neck pain and neck mobility.

Methods: Seventy patients with mechanical neck pain (25 males and 45 females, ages 20-55 years) participated in this study. The lateral gliding test was used to establish the presence of an intervertebral joint dysfunction at the C3 through C4 or C4 through C5 levels. Subjects were divided randomly into either an experimental group, which received an HVLA thrust, or a control group, which received a manual mobilization procedure. The outcome measures were active cervical range of motion and neck pain at rest, assessed pretreatment and five minutes posttreatment by an assessor blinded to the treatment allocation of the patient. Intragroup and intergroup comparisons were made with parametric tests. Within-group effect sizes were calculated using Cohen's *d* coefficient.

Results: Within-group changes showed a significant improvement in neck pain at rest and mobility after application of the manipulation ($P < .001$). The control group also showed a significant improvement in neck pain at rest ($P < .01$), flexion ($P < .01$), extension ($P < .05$), and both lateral flexions ($P < .01$), but not in rotation. Pre/post effect sizes were large for all the outcomes in the experimental group ($d > 1$), but were small to medium in the control mobilization group ($0.2 < d < 0.6$). The intergroup comparison showed that the experimental group obtained a greater improvement than the control group in all the outcome measures ($P < .001$). Decreased neck pain and increased range of motion were negatively associated for all cervical motions: The greater the increase in neck mobility, the less the pain at rest.

Conclusions: Our results suggest that a single cervical HVLA manipulation was more effective in reducing neck pain at rest and in increasing active cervical range of motion than a control mobilization procedure in subjects suffering from mechanical neck pain.

Work-related injuries of doctors of chiropractic in the United States.

Susan M. Holm, DC, MS, Kevin A. Rose, DC, MPH

Purpose: This study was undertaken to determine the prevalence and types of work-related injuries among a nationwide sample of chiropractors, and to identify factors associated with these injuries.

Methods: Using a survey, 1,000 randomly selected doctors of chiropractic in the United States were asked to record their three most serious injuries. Details were obtained about the type of injury, area of the body affected, activity performed at that time, year of practice when the injury had occurred, if the doctor had needed to take time off from work, and what they had changed as a result of the injury.

Results: A total of 422 responses were obtained (42.2%), yielding 397 usable surveys. One hundred fifty-nine chiropractors (40.1%) reported experiencing a total of 252 injuries while working. Most injuries were classified as soft-tissue injuries and occurred while either performing (66.7%) or positioning (11.1%) a patient for manipulation. Body parts most commonly injured were the wrist/hand/finger (42.9%), shoulder (25.8%), and low back (24.6%). The anatomic areas of the patient being manipulated in which the doctor was injured were the lumbosacral (37.1%) and thoracic spine (21.6%). Shoulder ($P < .001$) and low back ($P < .001$) injuries were significantly more likely to have been caused by adjustments of the lumbosacral spine with the patient in the side-lying position. Most commonly, injuries occurred in the first to fifth year of practice (37.3%). Of note, 5.4% of injuries reported occurred while attending chiropractic college.

Conclusion: A high prevalence of upper-extremity injuries was reported in the group surveyed. These injuries were most often related to side-posture manipulation to the lumbar spine. Because most injuries occurred early on in the career and required a change in technique, greater efforts toward injury prevention education should be aimed toward chiropractic students.

Short and long-term results of connective tissue manipulation and combined ultrasound therapy in patients with fibromyalgia.

Ilkim Citak-Karakaya, PT, PhD, Turkan Akbayrak, PT, PhD, Funda Demirturk, PT, PhD, Gamze Ekici, PT, PhD

Objective: The aim of the study was to evaluate the short-term and one-year follow-up results of connective tissue manipulation and combined ultrasound (US) therapy (US and high-voltage pulsed galvanic stimulation) in terms of pain, complaint of nonrestorative sleep, and impact on the functional activities in patients with fibromyalgia (FM).

Methods: This was an observational prospective cohort study of 20 female patients with FM. Intensity of pain, complaint of nonrestorative sleep, and impact of FM on functional activities were evaluated by visual analogue scales. All evaluations were performed before and after 20 sessions of treatment, which included connective-tissue manipulation of the back daily, for a total of 20 sessions, and combined US therapy of the upper back region every other session. One-year follow-up evaluations were performed on 14 subjects. Friedman test was used to analyze time-dependent changes.

Results: Statistical analyses revealed that pain intensity, impact of FM on functional activities, and complaints of nonrestorative sleep improved after the treatment program ($P < .05$).

Conclusion: Methods used in this study seemed to be helpful in improving pain intensity, complaints of nonrestorative sleep, and impact on functional activities in patients with FM.

Chiropractic users and nonusers: differences in use, attitudes, and willingness to use nonmedical doctors for primary care.

Gary Gaumer, PhD, Eric Gemmen

Objective: To determine the differences in attitudes and other determinants of care-seeking behavior between people who have used chiropractic services and those who have not. A second objective was to determine the interest in members of these two groups in choosing nonmedical doctors for providing routine services.

Methods: In 1998, a nationwide telephone survey of randomly selected households in the United States was done, including 400 adults who have used chiropractic services and 400 adults who have not. Survey participants were asked about their use, knowledge and attitudes about chiropractic care, attitudes about personal role in health care, current source of obtaining usual and routine care, and willingness to consider use of nonmedical doctors as the usual source of such care. The analysis compared people who have used with those who have not used chiropractic services by using a χ^2 test to determine significance of differences between the responses of the two groups. A multivariate analysis was done of willingness to use alternative providers for routine care.

Results: People who have seen a doctor of chiropractic before have different attitudes and preferences about health and health care than those who have never seen a doctor of chiropractic. Almost all of the subjects in both groups have medical doctors they use for routine care, and a sizeable portion of both groups would be willing to consider using a nonmedical doctor for this role. Although willingness to use a chiropractor in this role is much higher among those who have used a chiropractor before, both groups would prefer physician assistants and nurse practitioners to chiropractors in this role.

Conclusion: For participants of this survey, unwillingness to accept the idea of a chiropractor in a primary care role may be largely due to poor knowledge about chiropractic care.

Evaluation of functional and neuromuscular changes after exercise rehabilitation for low back pain using a Swiss ball: a pilot study.

Paul W. M Marshall, PG Dip Sci, Bernadette A. Murphy, PhD

Objective: The purpose of this pilot study was to use a multidimensional model to evaluate deficits in patients with low back pain (LBP) over the course of a 12-week rehabilitation program using the Swiss ball.

Methods: A within-subjects, repeated-measures design, based at the University exercise training clinic, was used. Twenty patients with chronic nonspecific LBP (12 men, eight women; symptom duration, 4.8 years; 38.8 ± 12.1 years old; height, 1.76 ± 0.06 m; weight, 76.15 ± 7.21 kg) participated in this study. Self-report measures were the Oswestry Disability Index, Visual Analog Scale, Medical Outcomes 12-Item Short Form Health Survey, and Self-Efficacy For Exercise Scale. Physiologic measures were electromyography measurement of feed-forward muscle activation, flexion relaxation phenomenon, myoelectric fatigue, endurance capacity measured by the Sorenson test, and a modified sit-up test. Individuals performed 12 weeks of progressive exercise periodized every four weeks using

a Swiss ball. Outcome measures were assessed at baseline, four weeks, eight weeks, 12 weeks, and at a three-month follow-up. Repeated-measures analysis for variance for time differences and regression analysis for variance in Oswestry scores were performed.

Results: The Oswestry score for self-reported disability significantly decreased over the intervention ($F_{4,14} = 19.456$, $P < .001$). Significant improvements in pain and disability maintained to the three months of follow-up. There were significant changes in perceptions of physical and mental well-being, erector spinae fatigue, and flexion relaxation measures. Change in flexion relaxation explained 38% of the improvement in Oswestry scores at the 12-week measurement.

Conclusions: This study showed that the Swiss ball may be successfully used in a rehabilitation context for patients with LBP. This pilot study has used a novel approach to assess improvements during a rehabilitation program, which may be used in the future to explain differences between different treatment modalities.

Reversible pelvic asymmetry: an overlooked syndrome manifesting as scoliosis, apparent leg-length difference, and neurologic symptoms.

Jussi Timgren, MD, Seppo Soynila, MD, PhD

Objective: The objective of this study was to investigate the occurrence of pelvic asymmetry in neurologic patients with symptoms not explained by their neurologic diagnosis.

Methods: We analyzed 150 consecutive neurologic patients referred to physiatric consultation based on their clinical examination findings.

Results: We observed pelvic asymmetry associated with either C-type or S-type scoliosis and apparent leg-length difference in 87% of the patients. Symmetry could be reestablished by all patients, although 15% showed immediate or imminent relapse. Maintenance of symmetry showed a highly significant ($P < .001$) correlation with improvement in functional ability and reduction of pain as evaluated during the last visit to the physiatrist. In the follow-up questionnaire, 78% of the patients reported improvement in functional ability and reduced pain.

Conclusions: Our results support the view that leg-length difference and scoliosis may be more often of reversible nature than previously considered. Acquired postural asymmetry of the sacroiliac joint may be a neglected cause of several neurologic and other pain-related symptoms that can be relieved by a simple and safe treatment.

Coupling behavior of the cervical spine: a systematic review of the literature.

Objective: The purpose of this study was to investigate evidence of consistency of reported directional coupling patterns among selected studies and to determine its use in manual medical treatment.

Methods: The study was a systematic literature review of English-only journals using PubMed and CINAHL. The keywords included "cervical vertebrae," "biomechanics," "coupling," and "three-dimensional movement" and required coupling directional assessment of individual spine segments.

Results: Four 2-dimensional and eight 3-dimensional studies met inclusion criteria. This study found

100% agreement in coupling direction (side flexion and rotation to the same side) in lower cervical vertebral segments (C2-3 and lower) and variation in coupling patterns in the upper cervical segments of occiput-C1 (during side flexion initiation) and C1-2. Dissimilarities may be explained by differences in measurement devices, movement initiation, in vivo vs. in vitro specimens, and anatomical variations.

Conclusions: These findings suggest that use of 3-dimensional analyzed cervical coupling patterns for the lower cervical vertebral during apposition and treatment application may show clinical use for manual clinicians. The use of directional coupling based on 2-dimensional cervical coupling patterns or upper cervical spine coupling that addresses C1-2 should be questioned.

Comparison of bioenergetic synchronization technique and customary chiropractic care for older adults with chronic musculoskeletal pain.

Cheryl Hawk, DC, PhD, Ronald L. Rupert, DC, Makasha Colonvega, DC, Jennell Boyd, DC, Stephanie Hall

Objective: The aim of the study was to compare the clinical outcomes of two approaches to chiropractic care for patients with chronic musculoskeletal pain. Included were the approach most commonly used by doctors of chiropractic (diversified technique spinal manipulation) and a nonmanipulative mind-body approach (bioenergetic synchronization technique). This clinical experiment tested the null hypothesis that there is no clinically or statistically significant difference in effect between the two approaches.

Methods: The study was conducted in the research clinic of the Parker College of Chiropractic. Patients were initially recruited by contacting a previously developed pool used for studies related to fall prevention in the elderly. Eighty-one patients (74 females; median age, 66 years) were enrolled and 78 (96%) completed the study. The primary end point was the end of a three-week nontreatment interval after a four-week treatment period. An intention-to-treat analysis was used; all patients who completed assessments were included whether or not they were compliant with the treatment protocol. A sample size of 55 per group was estimated to be necessary to detect a clinically significant (six-point) between-group difference in the Pain Disability Index (PDI). The primary outcome, the mean between-group difference between PDI scores at visit one and the exit visit, was tested with a two-tailed t test for independent samples.

Results: Mean improvements in the PDI from visit 1 to the exit visit were 6.9 points in the bioenergetic synchronization technique group (n = 40) and 6.4 points in the diversified technique group (n = 38); the between-groups difference was not statistically or clinically significant (95% confidence interval, -4.7 to 5.8).

Conclusions: For this particular group of patients, both subgroups demonstrated similar improvement scores on the PDI; the study's null hypothesis was not rejected.

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