

Journal of Manipulative Physiological Therapeutics

ABSTRACTS FOR MARCH/APRIL 2004 • VOLUME 27 - NUMBER 3

Editorial Staff

Degenerative changes following spinal fixation in a small animal model.

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Objective: The objective of this study was to evaluate changes of the lumbar vertebral column following fixation.

Design: Using an established small animal (rat) model of spinal fixation (hypomobility), 3 contiguous lumbar segments (L4, L5, L6) were fixed with a specially engineered vertebral fixation device. Spinal segments of control rats were compared with those of animals with 1, 4, or 8 weeks of fixation. Subgroups of these fixation animals subsequently had the fixation device removed for 1, 2, 4, 8, or 12 weeks to evaluate the effects of attempting to re-establish normal forces to the vertebral segments following hypomobility.

Setting: This IACUC-approved study was conducted in a university animal facility.

Animals: Eighty-seven animals (23 controls and 64 fixation animals) were used in this study.

Main outcome measures: Outcome measures were: degenerative changes of the vertebral bodies (VBs) and intervertebral discs (IVDs), Z-joint osteophyte formation, and Z-joint articular surface degeneration (ASD). Changes found in vertebral segments that were fixed (hypomobile) were compared with changes in adjacent nonfixed vertebral segments, and changes among fixation animals were compared with nonfixed controls.

Main results: Very few degenerative changes were identified on the VBs and IVDs. Z-joint changes were significant, both for osteophyte formation (ANOVA, $P < 0.0001$) and ASD (ANOVA, $P < 0.0001$). Fixed segments had more degenerative changes than non-fixed segments for all Z joint parameters (ANOVA, $P < 0.0001$). Osteophyte formation and ASD were directly dependent on duration of fixation.

Conclusions: These findings indicate that fixation (hypomobility) results in time-dependent degenerative changes of the Z-joints.

Key indexing terms: Zygapo-physial joints; facet joints; chiropractic; hypomobility; fixation; spondylopathy; degeneration.

Paraspinal skin temperature patterns.

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Background: Paraspinal thermography is used by chiropractors as an aid in assessing the presence of vertebral subluxation. Few reliability studies have been carried out, with mixed results. Digital infrared scanning equipment is now available with location tracking that may enhance reproducibility. Digitized scans enable a computer-aided interpretation of thermographic patterns.

Objective: To assess the ability of examiners to reproduce thermal patterns.

Study design: Repeated measures with 2 examiners assessing the same patient on 2 occasions. Thirty asymptomatic students served as subjects.

Methods: A TyTron C-3000 hand-held thermographic scanner interfaced to an MS-Windows compatible PC was used for all recordings. Each examiner recorded 2 scans on each patient. It took an average of 3 minutes to complete all 4 scans. Data were exported to a spreadsheet for initial analysis, then SPSS was used for calculation of Intraclass Correlation Coefficients (ICC). Since the starting and stopping points of scans were not always the same, care was taken to align scans visually, using well-distinguished peaks on the charts as guides. Scans were cropped to remove artifacts that might have occurred at the beginning and end of the scans. Intra-examiner and interexaminer ICCs were calculated.

Results: Skin temperatures ranged from 35.4-30.0 C over all scans. The average temperature changed little from the first to the last scans, indicating that subjects' overall skin temperature was stable during the scanning procedure. Intra-examiner ICCs ranged from 0.953-0.984. The left and right channel data showed slightly higher congruence than the Delta channel. The interexaminer reliability coefficients ranged from 0.918-0.975. Again the Delta channel showed slightly less reliability, although the ICCs were quite high for all channels.

Conclusion: Intra-examiner and inter-examiner reliability of paraspinal thermal scans using the TyTron C-3000 were found to be very high, with ICC values between 0.91 and 0.98. Changes seen in thermal scans, when properly done, are most likely due to actual physiological changes, rather than equipment error.

Key indexing terms: Chiropractic; skin temperature; thermography; assessment; vertebral subluxation.

A practice-based study of acute and chronic low back pain patients attending primary care and chiropractic physicians: Two-week to 48-month follow-up.

Mitchell Haas, DC ; Bruce Goldberg, MD; Mikel Aickin, PhD; Bonnie Ganger; Michael Attwood

Objective: This study reports pain and disability outcomes up to 4 years for chiropractic and medical low back pain patients, and assesses the influence of doctor type and pain duration on clinical outcomes.

Design: Prospective, longitudinal, nonrandomized, practice-based, observational study.

Setting: 51 DC and 14 general practice community clinics.

Subjects: 2,870 acute and chronic ambulatory patients with low back pain of mechanical origin.

Methods: 60 chiropractic (DC) and 111 general practice (MD) physicians participated. Primary outcomes were pain, using a 100-point visual analogue scale (VAS), and functional disability, using the Revised Oswestry Disability Questionnaire. These were measured at baseline and 8 time points.

Regression analysis compared acute and chronic DC and MD patients after correcting for baseline differences in the 4 cohorts.

Results: Most improvement was seen by 3 months and sustained for 1 year; exacerbation was seen thereafter. Acute patients demonstrated greater relief at all time points. A clinically important advantage for chiropractic patients was seen in chronic patients in the short-term (> 10 VAS points), and both acute and chronic chiropractic patients experienced somewhat greater relief up to 1 year ($P < .000$). The advantage for DC care was prominent for chronic patients with leg pain below the knee ($P < .001$). More than 50% of chronic patients suffered over 50 days of pain in the third year.

Conclusion: Study findings were consistent with systematic reviews of the efficacy of spinal manipulation for pain and disability in acute and chronic low back pain. Patient choice and interdisciplinary referral should be prime considerations by physicians, policy makers, and third-party payers in identifying health services for low back pain patients.

Key indexing terms: Low back pain; outcomes, predictors; chiropractic; medical care.

Implementing evidence-based guidelines for radiography in acute low back pain: a pilot study in a chiropractic community.

Carlo Ammendolia, DC, MSc; Sheilah Hogg-Johnson, PhD; Victoria Pennick, RN, BScN, MHSc; Richard Glazier, MD, MPH; Claire Bombardier, MD, MSc

Objective: To evaluate the ability of a systematic educational intervention strategy to change the plain radiography ordering behavior of chiropractors, for patients with acute low-back pain (LBP), toward evidence-based practice.

Design: A quasi-experimental method was used comparing outcomes before and after the intervention with that of a control community.

Setting: Two communities in southern Ontario.

Data source: Mailed survey data on the management of acute LBP.

Outcome measures: Plain radiography use rates for acute LBP based on responses to mailed surveys.

Results: Following the intervention, there was a 42% reduction in the self-report need for plain radiography for uncomplicated acute LBP ($p < 0.025$), and a 50% reduction for patients with acute LBP < 1 month ($p < 0.025$) in the intervention community. There was no significant change in the self-report need for plain radiography in the control community ($p > 0.05$).

Conclusions: The educational intervention strategy used in this study appeared to have an effect in reducing the perceived need for plain radiography in acute LBP.

Key indexing terms: Radiology; chiropractic; low back pain.

Naloxone fails to antagonise initial hypoalgesic effect of a manual therapy treatment for lateral epicondylalgia.

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Background: Recent research has shown that Mulligan's Mobilization With Movement treatment technique for the elbow (MWM), a peripheral joint mobilization technique, produces a substantial and immediate pain relief in chronic lateral epicondylalgia (48% increase in pain free grip strength). This hypoalgesic effect is far greater than that previously reported with spinal manual therapy treatments, prompting speculation that peripheral manual therapy treatments may differ in mechanism of action to spinal manual therapy techniques. Naloxone antagonism and tolerance studies, which employ widely accepted tests for the identification of endogenous opioid mediated pain control mechanisms, have shown that spinal manual therapy-induced hypoalgesia does not involve an opioid mechanism.

Objective: The aim of this study was to evaluate the effect of naloxone administration on the hypoalgesic effect of MWM.

Methods: A randomized, controlled trial evaluated the effect of administering naloxone, saline or no-substance control injection on the MWM induced hypoalgesia in 18 participants with lateral epicondylalgia. Pain-free grip strength, pressure pain threshold, thermal pain threshold and upper limb neural tissue provocation test 2b were the outcome measures.

Results: The results demonstrated that the initial hypoalgesic effect of the MWM was not antagonized by naloxone, suggesting a nonopioid mechanism of action.

Conclusions: The studied peripheral mobilization treatment technique appears to have a similar effect profile to previously studied spinal manual therapy techniques, suggesting a nonopioid, mediated hypoalgesia following manual therapy.

Key indexing terms: Endogenous opioid; hypoalgesia; manual therapy; Mulligan's Mobilization; naloxone; pain threshold.

Effect of a back belt on reaching postures.

Dean L. Smith, DC; Marvin J. Dainoff, PhD; Leonard S. Mark, PhD; Shawn P. Oates; Niles C. Davis

Objective: The present study investigated the effect of a back belt on reach actions.

Subjects: 16 undergraduate college students (8 male, 8 female) ranging in age from 18-22 years. Thirteen subjects were included in the final analysis.

Setting: The Department of Psychology at Miami University, Oxford, Ohio.

Methods: Using a well-established set of procedures developed in our laboratory for studying reaching, seated adult participants reached for and retrieved an object placed at various distances from them. Reach distances included values both closer than and farther than each subject's maximum seated reach. The reach task had 2 conditions: picking up and retrieving a small block, and skewering and retrieving a small bead with a needle. For each task condition, each subject either wore the belt or did not use a belt.

Results: Results indicate that when subjects wore the belt while reaching, they tended to have initial transition points (sitting to nonsitting) closer to their bodies than while not wearing the belt. That is, for a distant object, subjects were more likely to raise their bodies out of the chair rather than perform an extreme seated reach, possibly acting to preserve a greater margin of safety.

Conclusions: The back belt consistently modified reaching postures by limiting extreme ranges of motion during a task that required enhanced stability. Furthermore, the methodology and analysis presented in this paper when applied to chiropractic will allow us to begin thoughtful investigation of the effects of chiropractic adjustments on postural transitions and margin of safety.

Key indexing terms: Posture; back belt; ergonomics; chiropractic; coordination.

Safety of spinal manipulation in the treatment of lumbar disc herniations: a systematic review and risk assessment.

Drew Oliphant, DC

Objective: To provide a qualitative systematic review of the risk of spinal manipulation in the treatment of lumbar disc herniations (LDH), and to estimate of the risk of spinal manipulation causing a severe adverse reaction in a patient presenting with LDH.

Data sources: Relevant case reports, review articles, surveys and investigations regarding treatment of lumbar disc herniations with spinal manipulation, and adverse effects and associated risks were found with a search of the literature.

Data synthesis: Prospective/retrospective studies and review papers were graded according to quality, and results and conclusions were tabulated. From the data published, an estimate of the risk of spinal manipulation causing a clinically worsened disc herniation or CES in patients presenting with LDH is calculated. This is compared to estimates of the safety of NSAIDs and surgery in the treatment of LDH.

Results: An estimate of the risk of spinal manipulation causing a clinically worsened disc herniation or CES in a patient presenting with LDH is calculated from published data to be less than 1 in 3.7 million.

Conclusion: The apparent safety of spinal manipulation, especially when compared to other 'medically-accepted' treatments for LDH, should stimulate its' use in the conservative treatment plan of LDH.

Key indexing terms: Chiropractic manipulation; intervertebral disc herniation; cauda equina syndrome; low back pain; safety; adverse reactions.

Bone metastases from breast cancer: guidelines for diagnosis. A case report from the chiropractic office.

Anneke Verbeek, DC

Objective: To discuss the case of a 62-year-old woman with prior metastasis from breast cancer, who later sought chiropractic care, and to present an overview of appropriate imaging procedures in such cases.

Clinical features: The patient had a 6-month history of mild left-sided sacroiliac pain, which radiated into the left lateral thigh and leg. There was additional pain over the left upper ribs and left posterior arm, which had started insidiously. One year prior she had undergone a lumpectomy. Current X-rays were negative for carcinoma.

Intervention and outcome: Cautious spinal manipulation and soft tissue procedures was used to treat her sacroiliac joints. The thoracic pain was left untreated. The patient improved over the first 7 visits, but had pain return after swimming. After ceasing therapy, she still suffered from similar pain.

Conclusions: It is important to assess patients who present with new bone pain after they already have a history of breast malignancy. Chiropractic physicians should take appropriate diagnostic steps to rule out suspected malignancy when there is no plain film evidence and biopsy is negative.

Key indexing terms: Breast cancer; metastases; chiropractic; case report; guidelines.

Chiropractic care of a geriatric patient with an acute fracture-subluxation of the eighth thoracic vertebra.

Joel Alcantara, DC; Gregory Plaugher DC; Richard A. Elbert; Deborah Cherachanko, DC; James E. Konlande, PhD; Aaron M. Casselman

Objective: To describe the chiropractic care of a geriatric patient with complaints of mid-thoracic and low back pain.

Clinical features: A 74-year-old female sought chiropractic care with complaints of thoracic spinal pain following a fall. Palpation findings included hypertonicity and tenderness, along with painful muscle spasms in the paraspinal musculature of the thoracolumbar spine. Limited range of thoracolumbar motion was found on extension and lateral flexion, most notably on right lateral flexion with pain. Radiographic examination revealed a compression fracture at T8, in addition to spinographic listings. Signs of sprain injury were also detected at T8.

Intervention and outcome: The patient was cared for with contact-specific, high-velocity, low-amplitude adjustments to sites of vertebral subluxations and at the T8 fracture-subluxation. The patient's response to care was positive.

Conclusion: This case report describes the clinical features, care, and results of one geriatric patient with a thoracic compression fracture-subluxation, treated with specific chiropractic procedures. The patient had an apparent decrease in pain as a result of the treatment. Due to the inherent limitations of a case report, it is inappropriate to generalize this outcome.

Key indexing terms: Geriatrics; chiropractic; fracture; thoracic vertebra.

MAY 2004