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Editorial Staff

The Nordic Back Pain Subpopulation Program: validation and improvement of a predictive model for treatment outcome in patients with low back pain receiving chiropractic treatment.

Iben Axén, DC; Jess James Jones, MSc; Annika Rosenbaum, BAppSc(Chiro); Peter W. Lövgren, DC; Laszlo Halasz, MHSc(ClinBiomech); Kristian Larsen, PT, MPH; Charlotte Leboeuf-Yde, DC, MPH, PhD

Objective: The aim of this study was to develop a predictive model for treatment outcome in patients with low back pain (LBP) receiving chiropractic treatment.

Methods: This multicenter, practice-based predictive validity study was conducted in private chiropractic practices in Sweden. Of 64 previously compliant chiropractors, 58 recruited a maximum of 30 consecutive patients with LBP each. Information was provided on 1,061 patients, of which 1,057 questionnaires were valid. Chiropractic treatment was decided by the treating chiropractor. The outcome variable was the self-reported "definite improvement" at the fourth visit. The predictor variables included model 1: three hypothesized prognostic groups (best, intermediate, and least favorable) based on clinical information collected at baseline and at the second visit; and 4 additional models based on the following variables: age, sex, pain intensity during past 24 hours, description of disability, duration and pattern of pain during present attack, total duration of pain, and pain pattern during the past 12 months.

Results: Three of our factors were best at predicting the absence of improvement by the fourth visit and were able to correctly classify 79% of patients and to cover 74% of the receiver-operated characteristics curve. These were (1) no definite overall improvement by the second treatment, (2) presence of leg pain, and (3) the minimum total duration of pain over the last 12 months being 30 days.

Conclusion: In this study, patients with LBP who also had leg pain and LBP occurring sufficiently frequently or having lasted sufficiently long to add up to at least 30 days in the past year, and who did not report definite general improvement by the second treatment, were not good candidates for short-term recovery. It is suggested that patients who fit the criteria of potential nonresponders should be carefully monitored to allow a selective approach of care.

Implications for the use of postural analysis as a clinical diagnostic tool: reliability of quantifying upright standing spinal postures from photographic images.

Nadine M. Dunk, BSc; Jennifer Lalonde, BSc; Jack P. Callaghan, PhD

Objectives: A repeated measures design was used to test the reliability of standing spine postures within subjects using a biologically relevant measure determined by digitization of images, and to compare the results to a previously tested vertical reference method.

Methods: Twenty subjects attended 3 sessions consisting of 5 trials each. Photographs of the sagittal and posterior views of normal upright standing were taken. Landmarks were digitized and cervical, thoracic, and lumbar spinal angles were calculated using the algebraic dot product. Intraclass correlation coefficients were used to evaluate intrasubject reliability across sessions.

Results: According to the intraclass correlation coefficients, posture had good to excellent reliability in the sagittal view and provided a more stable measure of spinal angles than the posterior view. Mean repositioning errors were less than 6° and 2° in the sagittal and posterior views, respectively.

Conclusions: Although the repeatability of posture was improved in the sagittal view, when a biological measure was used instead of an external vertical reference to calculate spinal angles, individual subject posture was still variable. This brings into question the effectiveness and validity of using surface skin markers to track postural changes due to clinical interventions. If the postural analysis approach is to be used to detect changes due to clinical treatment, such changes must be larger than the baseline repositioning errors seen in healthy subjects.

Cervical muscle response to head rotation in whiplash-type right lateral impacts.
Shrawan Kumar, PhD, DSc, FErgS; Robert Ferrari, MD; Yogesh Narayan, BSc(EE), PEng

Objective: To determine the electromyogram (EMG) response of the cervical muscles to a right lateral impact whiplash-type perturbation when the head is rotated.

Methods: Twenty healthy volunteers were subjected to right lateral impacts of 4.2, 8.1, 10.3, and 12.5 m/s² and were looking either left or right. Bilateral EMGs of the sternocleidomastoid, trapezius, and splenius capitis muscles were recorded. Triaxial accelerometers recorded the acceleration of the chair, torso at the shoulder level, and head of the participant.

Results: In a right lateral impact, muscle responses were of low magnitude with the head rotated to either the left or the right. At the highest acceleration of 12.5 m/s², all generated less than 39% of their maximal voluntary contraction EMG. The sternocleidomastoid muscle showed a greater EMG response than its counterpart and the muscles contralateral to the direction of impact had higher EMG responses. The time to onset of the EMG for the splenius capitis and trapezius generally decreased with increasing levels of acceleration. As anticipated, an increase in applied acceleration resulted in an increase in accompanying head accelerations ($P < .05$), and when the head acceleration increased, so too did the force equivalent exertions by the various muscles.

Conclusions: Overall, a right lateral impact with head rotation to either the right or left appears to reduce the activity and thus the risk of muscle injury, perhaps because of "bracing" by muscles actively producing rotation or because of greater spinal stability from other structures when the head is in the rotated position.

Translation and validation of the Danish version of the Bournemouth Questionnaire.
Jan Hartvigsen, DC, PhD; Henrik Lauridsen, DC, MSc; Sandra Ekström, DC; Mikael Busse Nielsen, DC; Frederik Lange, DC; Nikolai Kofoed, DC; Niels Grunnet-Nilsson, DC, MD, PhD

Objective: Translation, cultural adaptation, and validation of the Danish version of the Bournemouth Questionnaire (BQ).

Methods: Translation/retranslation of the English version of the BQ was done blindly and

independently by 4 different individuals and adapted by an expert team. The Danish version of the BQ was tested for face validity in a sample of low-back pain (LBP) patients attending 2 chiropractic clinics. Reproducibility was tested using 28 stable LBP patients attending a hospital outpatient back-pain clinic. Finally, the Danish version of the BQ was tested for external construct validity, external longitudinal construct validity, internal consistency, and sensitivity to change against the Danish versions of the SF-36 and the Roland-Morris Disability Questionnaire (RMDQ) using 118 first-time LBP patients reporting to 1 of 7 chiropractic clinics.

Results: Minor changes were made after the face-validity test. Intraclass correlation coefficient of the total score for the BQ based on the 2 administrations was 0.96. Satisfactory values for the external construct validity and the external longitudinal construct validity were found using both Pearson *r* and Bland-Altman plots. Cronbach α 's were .89 and .88 for the pretreatment and posttreatment scores, respectively. The Danish version of the BQ showed greater responsiveness than the SF-36 and similar responsiveness when compared with the RMDQ.

Conclusions: The BQ was successfully translated and culturally adapted into Danish. The BQ was successfully tested for validity, consistency, and responsiveness against the Danish version of the SF-36 and RMDQ.

Implementation of a course on wellness concepts into a chiropractic college curriculum.
Cheryl Hawk, DC, PhD; Ronald L. Rupert, MS, DC; John K. Hyland, DC, MPH; Anjum Odhwani, MD, MPH

Objective: The purpose of this study is to implement and evaluate a course on "wellness concepts" for chiropractic students, emphasizing national goals and evidence-based practices for health promotion and prevention.

Methods: Teaching methods included traditional lecture discussions and experiential activities, including objectives described in *Healthy People 2010*. Evaluation included pre- and posttests of students' familiarity with and intention to use key concepts, resources, and practices; item analysis of multiple choice exams; and a qualitative survey.

Results: Increases in students' self-reported familiarity were statistically significant for all but 2 of the 23 key topics assessed. At baseline, students already expressed intention to use most wellness-related practices listed, and showed significant increases for approximately half the practices listed at the posttest. Item analysis found students less able to correctly answer questions requiring analytic thinking than simple memorization. Students were most satisfied with the experiential portions of the course.

Conclusion: Although the course was successful at introducing students to national resources and initiatives related to wellness, health promotion, and prevention, these concepts may be more meaningful if integrated into a teaching clinic that encouraged practical application of course concepts.

High-velocity low-amplitude spinal manipulation for symptomatic lumbar disk disease: a systematic review of the literature.

Anthony J. Lisi, DC; Erica J. Holmes, DC; Carlo Ammendolia, DC

Objective: The aim of the study was to review the evidence for high-velocity low-amplitude spinal manipulation (HVLASM) for symptomatic lumbar disk disease (SLDD).

Methods: A systematic review of the literature was performed. The Cochrane Central Register of Controlled Trials, MEDLINE, Cumulative Index to Nursing and Allied Health Literature, and MANTIS were searched. Evidence-based operational definitions of SLDD, HVLASM, and outcomes measures were established. Articles were assessed using these inclusion criteria: (1) published in English, (2) measured at least one outcome in subjects with SLDD undergoing HVLASM, (3) descriptions were sufficiently clear to meet all 3 categories of our operational definitions. Articles that met the inclusion criteria were assessed by 2 independent reviewers and assigned quality ratings based on previously published guidelines.

Results: Sixteen studies met the inclusion criteria, representing 203 total subjects. Of these, 172 subjects received HVLASM as active treatment, and 31 received other treatments as comparison subjects. Improvements in patient-based and physiological outcomes were reported among subjects receiving HVLASM; however, no conclusions regarding safety and effectiveness could be drawn from this review because the overall body of evidence uncovered was lacking in quality and quantity.

Conclusion: HVLASM for SLDD has been reasonably described in the literature; however, the evidence is limited, and definitive conclusions on safety and effectiveness cannot be made at this time. The reviewed evidence supports the hypothesis that HVLASM may be effective in the treatment of SLDD and does not support the hypothesis that HVLASM is inherently unsafe in SLDD cases. It appears that patients with lumbar disk pathology do undergo manipulative treatment in practice. Consequently, this should be an area of research importance. More high-quality clinical trials using valid and reliable diagnostic criteria and outcomes measures are needed.

A systematic review of conservative treatments for acute neck pain not due to whiplash.
Howard T. Vernon, DC, PhD; B. Kim Humphreys, DC, PhD; Carol A. Hagino, MBA

Objective: To identify the evidence base of clinical trials of conservative treatments for acute neck pain not due to whiplash injury.

Design and Setting: A comprehensive literature search was performed in MEDLINE, CINHAHL, AMED, MANTIS, Index to Chiropractic Literature, Alt HealthWatch, the Cochrane Database of Systematic Reviews, the Cochrane Controlled Trials Registry, and several EBSCO Information Services databases. Systematic retrieval and evaluation procedures were used.

Results: The search generated 1,980 citations. Four trials (5 publications) were accepted according to the inclusion/exclusion criteria. Three trials used a form of spinal manual therapy. One of these trials used only one manipulation and reported immediate effects on pain, with real manipulation producing significantly greater pain reduction than control procedure. The other 2 of these trials reported on outcomes over 1 to 3 weeks. In 1 trial, the group receiving manipulation showed significantly greater pain reduction at 1 week than did the group receiving only medication. In the other trial, the group receiving transcutaneous electrical nerve stimulation had a significantly greater level of pain reduction at 3 weeks. In the fourth trial, exercise was compared to passive physiotherapy; however, outcomes were not reported until 6 and 12 months, so the results cannot be compared to the natural history of acute neck pain not due to whiplash.

Conclusion: There is limited evidence of the benefit of spinal manipulation and transcutaneous electrical nerve stimulation in the treatment of acute neck pain not due to whiplash injury. There is a dearth of high-quality clinical trials of conservative treatments for this condition.

Symptomatic herniation pit of the femoral neck: a case report.

Cameron Borody, DC

Objective: To discuss herniation pits of the femoral neck as a possible source of hip pain in a young athletic population.

Clinical Features: A 25-year-old former varsity volleyball player sought treatment for recurrent episodes of sharp left hip pain after intense physical activity. Radiographs revealed a small, oval, lobulated radiolucency with a thin sclerotic border in the superolateral aspect of the left femoral neck. Passive internal rotation of the left hip reproduced the complaint. Iliopsoas tendinitis/bursitis tests did not reproduce the complaint.

Intervention and Outcome: The patient reported no significant reduction of hip pain after a variety of conservative therapies including soft tissue therapy, stretching, interferential current, and long-axis distraction.

Conclusion: There is evidence to suggest that herniation pits of the femoral neck are a result of mechanical stress from the overlying joint capsule and iliopsoas tendon. Herniation pits of the femoral neck should be considered a potential cause of hip pain, particularly if the patient is physically active.

Conservative treatment of a patient with syringomyelia using chiropractic biophysics protocols.
Jason W. Haas, DC; Deed E. Harrison, DC; Donald D. Harrison, PhD, DC, MSE; Brian Bymers, DC

Objective: To present a case of a 41-year-old man with syringomyelia and intractable pain and the subsequent reduction of symptoms.

Clinical Features: This patient acquired a traumatically induced syrinx in his upper cervical spinal cord after he fell approximately 9 feet and landed on his head, upper back, and neck 9 years before presenting for care. He was diagnosed with a spinal cord cyst (syrinx), located at approximately C2 through C4 after magnetic resonance imaging. In 1995, the patient underwent occipitoatlantal decompression surgery, which improved his symptoms for a short time.

Intervention and Outcomes: The patient was treated using Clinical Biomechanics of Posture protocol. The patient was seen 26 times over the course of 3 weeks. His scale for pain severity decreased 50% and other subjective complaints decreased. His posture improved based upon pretreatment and posttreatment lateral cervical radiographs, showing a change from a 10° lordosis with midcervical kyphosis to a 30° lordosis. One-year follow-up examination showed stable improvement in the cervical lordosis and pain intensity.

Conclusion: This case represents a change in subjective and objective measurements after conservative chiropractic care. This case provides an example that structural rehabilitation may have a positive effect on symptoms of a patient with syringomyelia.

Editor's note: Due to space constraints, not all abstracts from the July 2005 issue of *JMPT* are featured in this article. To review the entire July issue, visit www.mosby.com/jmpt.

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