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Editorial Staff

Neck-tongue syndrome.

Cameron Borody, BSc, DC

Objective: To discuss a case of Neck-Tongue Syndrome affecting a dancer/figure skater, review literature summarizing the pathogenesis and treatment, and offer new categorization of Neck-Tongue Syndrome.

Clinical features: A 24-year-old female dancer/skater sought treatment for recurrent episodes of right-sided upper-neck pain with associated ipsilateral numbness of her tongue, following brisk active rotation. Radiographs revealed a narrowing of the left para-odontoid space. Physical examination revealed a mildly painful restriction in rotation at C1-C2, with no apparent muscular hypertonicity.

Intervention and outcome: The patient had sought chiropractic treatment for this condition at several times since she was 8 years old. Diversified chiropractic adjustments were applied to restrictions throughout the cervical spine as determined by the clinician. No other interventions were employed. The patient experienced significant improvement in frequency and intensity of the neck and tongue symptoms following spinal manipulative therapy applied to her cervical spine.

Conclusions: There are two categories of NTS: complicated-NTS due to the presence of an underlying disease process (inflammatory or degenerative); and uncomplicated-NTS (idiopathic or trauma-related). This case report is of uncomplicated-NTS that responded favorably to spinal manipulative therapy directed at the cervical spine. In the absence of upper-cervical instability, spinal manipulative therapy appears to be beneficial and should be considered in all cases of uncomplicated NTS.

Key indexing terms: Neck-Tongue Syndrome; atlantoaxial instability; cervical collar; chiropractic manipulation.

The amelioration of symptoms in cervical spinal stenosis with spinal cord deformation through specific chiropractic manipulation: a case report with long-term follow-up.

George W. Kukurin, DC, DACAN

Objective: To describe the chiropractic management of a patient with paraesthesia on the entire left side of her body, and MRI-documented cervical spinal cord deformation secondary to cervical spinal stenosis.

Clinical features: A 70-year-old special education teacher had neck pain, headaches and burning paraesthesia on the entire left side of her body. These symptoms developed within hours of being

injured in a side-impact motor vehicle accident. Prior to her visit she had been misdiagnosed with a cerebrovascular accident.

Intervention and outcomes: Additional diagnostic studies revealed that the patient was suffering from cervical spinal stenosis with spinal cord deformation. Two manipulative technique systems (Advanced Biostructural Therapy and Atlas Coccygeal Technique), unique to the chiropractic profession and based on the theory of relief of adverse mechanical neural tension, were administered to the patient. This intervention provided complete relief of the patient's complaints. The patient remained symptom-free at long-term follow-up, one-year post-accident.

Conclusion: There is a paucity of published reports describing the treatment of cervical spinal stenosis through manipulative methods. Existing reports of the manipulative management of cervical spondylosis suggest that traditional manual therapy is ineffective or even contraindicated. This case reports the excellent short- and long-term response of a 70-year-old patient with MRI-documented cervical spinal stenosis and spinal cord deformation to less traditional, uniquely chiropractic manipulative techniques. This appears to be the first case (reported in the indexed literature) that describes the successful amelioration of the symptoms of cervical spinal stenosis through chiropractic manipulation. More research into the less traditional chiropractic systems of spinal manipulation should be undertaken.

Key indexing terms: Chiropractic; cervical spine; stenosis.

Paraspinal muscles and intervertebral dysfunction: part two.

Gary Fryer, BAppSc(Osteo); Tony Morris, PhD; Peter Gibbons, MB, BS, DO

Background: One of the diagnostic characteristics of the manipulable spinal lesion - a musculoskeletal disturbance that is claimed to be detected with manual palpation and corrected with manipulation - is said to be altered segmental tissue texture. Little evidence for the nature of abnormal paraspinal tissue texture exists, but indirect evidence from experimental studies support the plausibility of the concept of protective muscle spasm, although investigations of increased paraspinal EMG associated with low back pain suggested complex changes in motor control, rather than simple protective reflexes.

Objectives: To review the literature for evidence that may support or refute proposed explanations for clinically observed altered paraspinal tissue texture associated with the manipulable spinal lesion. This review aims to highlight areas that require further research and make recommendations for future studies.

Data source: MEDLINE and CINAHL databases were searched using various combinations of the keywords: paraspinal; muscle; palpation; EMG; spine; low back pain; pain; myofascial; hardness; manipulation; reliability; somatic dysfunction; along with searching the bibliographies of selected articles and textbooks.

Data extraction: All relevant data were used.

Results: Decreased paraspinal muscle activity and strength associated with low back pain is well established, and there is evidence of changes in muscle fibre composition and localized selective multifidus atrophy. Disturbances in microcirculation have been implicated in nonparaspinal muscle pain. The effect of spinal manipulation on paraspinal EMG activity is inconclusive, but promising.

Conclusion: Little direct evidence exists to support the existence or nature of paraspinal tissue

texture change claimed to be detected with palpation. The proposal of segmental reflex paraspinal muscle contraction was not supported, at least in association with low back pain. There appears to be a complex relationship between deep paraspinal muscle inhibition during dynamic activity, and nonvoluntary guarding behaviour during static activity. The relationship between these findings and palpable tissue change is speculative, but increased activity, decreased activity, or both may be responsible for paraspinal tissues detected as abnormal with palpation. Recommendations are outlined for future research.

Key indexing terms: Spine; muscle; palpation; chiropractic; osteopathic medicine.

Chiropractic care of a patient with low back pain associated with subluxations and a Malgaigne-type pelvic fracture.

Joel Alcantara, DC; Gregory Plaucher, DC; Richard Elbert, DC; Bryan Gatterman, DC

Objective: To describe the chiropractic care of a patient with a pelvic ring fracture and concomitant subluxations of multiple segments of the spinal column.

Clinical features: A 23-yr-old male, after falling down a flight of stairs, was initially hospitalized for fractures of the pelvis. Five weeks post-hospitalization, the patient initiated chiropractic care with complaints of severe low-back pain with lower extremity involvement. He also complained of neck pain and occipital headache. The patient had several positive low back orthopedic tests with bilaterally absent Achilles deep tendon reflexes. The anteroposterior radiographic view revealed ununited fractures at the left superior and inferior pubic ramus, noted as a Type I Malgaigne fracture. Subluxations were detected at the left innominate (i.e., fracture-subluxation) and at the patient's lumbar, thoracic and cervical spine.

Intervention and outcome: The patient was cared for with contact specific, high-velocity, low-amplitude adjustments to sites of vertebral and sacroiliac subluxations. The patient's response to care was positive, receiving great pain relief. Less than three months after initiating care, the patient returned to work on regular duty.

Conclusion: There are indications that patients suffering from the injuries described above may derive benefits from chiropractic care. The practitioner must pay careful attention to issues of biomechanical and vascular stability, and adjustment modifications in these types of patients.

Key Indexing Terms: Chiropractic; Malgaigne fracture; low back pain.

Low back pain in Australian adults. Health provider utilization and care-seeking.

Bruce F. Walker, DC, MPH; Reinhold Muller, MS, PhD; William D. Grant, EdD

Objective: To determine the characteristics of Australian adults who seek care for low back pain, including the type of care they choose and any factors associated with making those choices.

Design: A population-based mailed survey.

Subjects: An age, gender and state stratified random sample of 2,768 Australian adults selected from the Electoral Roll.

Methods: A self-administered, fully structured questionnaire included a series of questions relating

to care-seeking for low back pain, choice of provider and types of treatment received. In addition a series of questions were asked relating to demographic characteristics, socioeconomic variables, severity of low back pain, cigarette smoking, anthropometric variables, perceived cause of low back pain, lifetime emotional distress, job satisfaction, lifetime physical fitness, past five-year health status, and fear of LBP causing future impairment.

Results: The response rate was 69.1%. The sample proved to be similar to the Australian adult population. The majority of respondents with low back pain in the past six months did not seek care for it (55.5%). Factors that increased care seeking were higher grades of pain and disability severity, fear of the impact of pain on future work and life and female sex. Factors decreasing the likelihood for seeking care were identified as the cause of pain being an accident at home and also never being married. General medical practitioners and chiropractors are the most popular providers of care.

Conclusion: This study shows that a majority of people did not seek care for their low back pain. The reasons for care-seeking proved to be independent of social or economic status.

Key indexing terms: Low back pain; health care provider; care-seeking; health services research.

A survey of U.S. chiropractors on clinical preventive services.

Cheryl Hawk, DC, PhD; Cynthia R. Long, PhD; Michael Perillo, DC, MPH; Karen T. Boulanger

Objective: To assess attitudes of current chiropractic students, public health faculty and practitioners toward the topics of clinical preventive and health promotion services.

Design and population: Survey of samples of students and faculty at 10 U.S. chiropractic colleges and random sample of U.S. chiropractors, stratified by zip code region using proportional allocation.

Data analysis: Descriptive statistics were computed for all three samples and statistical modeling was used to explore relationships between practitioner characteristics and their responses concerning counseling on health indicators.

Results: A total of 582 students, 45 faculty and 496 practitioners were surveyed; the response rate for practitioners was 27%. Over 80% of practitioners reported providing information to patients on musculoskeletal risk reduction, exercise, diet, stress reduction and injury prevention. Over 80% also reported obtaining information from patients on physical activity, stress, dietary habits, obesity, medication use and occupational hazards. Concerning immunization information, a much higher proportion of faculty (91%) and students (80%) than practitioners (62%) felt chiropractors should provide both "pro" and "con" information to patients.

In general, female, younger, and more recently graduated practitioners appeared to be somewhat more likely to agree that chiropractors should provide counseling and to report providing it. An association was seen between attitudes toward health indicator counseling and respondent education. Practitioners with at least a bachelor's degree were statistically significantly more likely to report providing counseling for physical activity, and to both agree that chiropractors should and to report actually providing counseling within the last month for substance abuse, responsible sexual behavior, mental health and injury and violence prevention ($p < 0.05$).

Conclusions: Our results indicate that a substantial proportion of the U.S. chiropractors and students who completed our survey, as well as a number of key faculty, have a positive attitude

toward providing clinical preventive services, particularly those related to physical activity and diet. However, the results also suggest that there may be areas where chiropractic training is not consistently meeting the newly established national guidelines for clinical preventive services.

Key indexing terms: Chiropractic; surveys; preventive health services; health promotion; healthy people programs.

Immediate improvements in side-to-side weight-bearing and iliac crest symmetry after manipulation in patients with low back pain.

John D. Childs, PT; Sara R. Piva, PT; Richard E. Erhard, DC, PT

Background: Although there is good evidence that spinal manipulation is an effective treatment to improve pain and function for patients with LBP, there is little evidence to support the mechanism by which manipulation works.

Objectives: To determine if iliac crest (IC) and weight-bearing (WB) symmetry improve after spinal manipulation, and to determine if improvements in IC and WB symmetry are associated with improvements in pain and function in patients with low back pain (LBP).

Design: Single group, within subjects, repeated measures design.

Method: Thirty consecutive patients (mean age = 40 ± 13) who came to a spine specialty center for treatment of acute or chronic LBP and who would be receiving spinal manipulation participated in the study (14 male). Patients completed a series of self-report measures of pain and function and received a standardized physical examination, including the assessment of IC and WB symmetry. Patients received a standardized manipulative intervention, and a blinded examiner performed an immediate three-to-four-day follow-up examination. Paired t-tests were performed to determine within group changes, and Pearson product moment correlation coefficients were calculated to determine the relationship between improvements in IC and WB symmetry and improvements in pain and function. To control for the potential that an association between changes in IC and/or WB symmetry and changes in pain and function could be confounded by the baseline outcome measure, simultaneous linear regression was performed on any significant correlation. Partial F tests were used to determine if the additional explained variability was significant.

Results: Patients with LBP demonstrated significant improvements in IC and WB symmetry after manipulation ($p < .001$). Improvements in WB symmetry were associated with improvements in the patient's self-reported levels of pain three days to four days after manipulation ($r = .5$, $p = .007$). Based on the significant association between improvements in WB symmetry and improvements in pain, the final pain score was regressed on the change in WB symmetry, after controlling for the baseline level of pain. The addition of the change in WB symmetry explained a 10% additional increase in variability in the patient's level of pain at the 3-4 day follow-up ($p = .01$). No relationship was found between improvements in IC and WB symmetry and improvements in function as determined by the Oswestry Disability Questionnaire 3-4 days after manipulation.

Conclusion: IC and WB symmetry improved immediately after spinal manipulation. Improvements in WB symmetry were related to improvements in the patient's self-reported level of pain, even after controlling for the baseline level of pain. Improvements in IC and WB symmetry were not related with changes in function. The results of this study provide initial data to elucidate how manipulation may work to improve pain and function in patients with LBP.

Key indexing terms: Level of health; measurement; lumbar spine; sacroiliac joint.

Recruitment and accrual of women in a placebo-controlled clinical pilot study on manual therapy.
Jerrilyn A. Cambron, DC, MPH; Cheryl Hawk, DC, PhD; Roni Evans, DC; Cynthia R. Long, PhD

Objective: To investigate the accrual rates and recruitment processes among three Midwestern sites during a pilot study on manual therapy for chronic pelvic pain.

Design: Multi-site pilot study for a randomized, placebo-controlled clinical trial

Setting: Three chiropractic institutions in or near major metropolitan cities in the Midwestern United States.

Subjects: Thirty-nine women ages 18 to 45 with chronic pelvic pain of at least six month's duration, diagnosed by a board certified gynecologist.

Main outcome measures: The method of recruitment was collected for each individual who responded to an advertisement and completed an interviewer-administered telephone screen. Participants who were willing and eligible after three baseline visits were entered into a randomized clinical trial. The number of responses and accrual rates were determined for the overall study, each of the three treatment sites, and each of the five recruitment efforts.

Results: In this study, 355 women were screened over the phone and 39 were randomized, making the rate of randomization approximately 10%. The most effective recruitment methods leading to randomization were direct mail (38%) and radio advertisements (34%). However, success of the recruitment process differed by site.

Conclusions: Based on the accrual of this multi-site pilot study, a full-scale trial would not be feasible using this study's parameters. However, useful information was gained on recruitment effectiveness, eligibility criteria, and screening protocols among the three metropolitan sites

Key indexing terms: Chiropractic; patient selection; randomized controlled trials; controlled clinical trials.

Central neuronal plasticity, low back pain and spinal manipulative therapy plasticity, LBP, and SMT.

Robert W. Boal, PhD; Richard G. Gillette, PhD

Objective: Recent experimental evidence demonstrating neuronal/synaptic plasticity and, in particular, long-term potentiation (LTP) and long-term depression (LTD) in spinal neurons is reviewed. The implications of these studies for possible mechanistic explanations of low back pain and its remediation by spinal manipulative therapy (SMT) are explored. Brief descriptions of LTP and LTD and elaboration of the key roles of calcium, glutamate and glutamate receptors in LTP/LTD are provided as separate appendices.

Data sources: The referenced articles regarding LTP/LTD in spinal cord neurons and neuronal plasticity, in general, were identified from accumulated review of the neuroscience literature. Publications cited from chiropractic sources relevant to central neuronal plasticity and LTP/LTD were identified using the Index to Chiropractic Literature and informal review.

Study selection: Experimental studies examining LTP/LTD mechanisms in spinal neurons and more general references useful as an introduction to central neuronal plasticity and LTP/LTD are included.

Data extraction: Experimental evidence presented in this review has been previously published and illustrates neuronal plasticity from an animal model for low back pain.

Data synthesis: Both *in vitro* and *in vivo* evidence identifying LTP and LTD in dorsal horn nociceptive neurons is reviewed. Of special interest are studies showing LTP in response to intense noxious stimulation and reports that A-delta-mechanosensitive afferent activation can reverse an existing LTP condition in dorsal horn neurons.

Conclusions: The potential involvement of LTP in low back pain is discussed and a role for LTD in spinal manipulative therapy (SMT) is proposed. The need for future studies is identified in the areas of spatial and temporal changes in symptomology post-SMT of the low back; combining, sequencing, and comparing several therapeutic approaches; and demonstrating LTD in spinal cord neurons post-SMT-like stimulation.

Key indexing terms: Low back pain; chiropractic manipulation: central sensitization.

Clinical and cost outcomes of an integrative medicine IPA.

Richard L. Sarnat, MD; James Winterstein, DC

Objective: Conventional medicine has controlled neither the increasing prevalence of chronic disease nor the escalation of medical expenditures. We hypothesized that primary care physicians (PCPs) specializing in a nonpharmaceutical/nonsurgical approach as their primary modality, utilizing a variety of complementary and alternative medicine (CAM) techniques integrated with allopathic medicine, would have superior clinical and cost outcomes compared to PCPs utilizing conventional medicine alone.

Design: Incurred claims and stratified randomized patient surveys were analyzed for clinical outcomes, cost offsets and member satisfaction, compared to normative values. Comparative blinded data, using nonrandomized matched comparison groups, was analyzed for age/sex demographics and disease profiles to examine sample bias.

Setting: An integrative medicine independent provider association (IPA) contracted with an NCQA-accredited HMO in metropolitan Chicago.

Subjects: All members enrolled with the integrative medicine IPA from 1/1/99 through 12/31/02.

Results: Analysis of clinical and cost outcomes on 21,743 member months over a four-year period demonstrated decreases of 43.0% in hospital admissions/1,000; 58.4% hospital days/1,000; 43.2% outpatient surgeries and procedures/1,000; and 51.8% pharmaceutical cost reductions, when compared to normative conventional medicine IPA performance for the same HMO product in the same geography over the same time frame.

Conclusion: In the limited population studied, PCPs utilizing an integrative medical approach emphasizing a variety of CAM therapies had substantially improved clinical outcomes and cost offsets compared to PCPs utilizing conventional medicine alone. While certainly promising, these initial results may not be consistent on a larger and more diverse population.

Key indexing terms: CAM therapy; medicine; outcomes; primary care physician; managed care.

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