

One month of Abstracts from the CHIROPRACTIC page on Facebook

John Lin

Introduction

Towards the end of 2022 an existing CHIROPRACTIC page (1) in Facebook, dating from 2014, came under the administration of Dr Charles Blum. His goal is to have it be an open-window display to the public about how caring, educated, and proficient chiropractors are and how they share information with each other. Chiropractors are expansive in their knowledge and are patient-centred practitioners with a deep desire to help others.

On behalf of this *Journal* I monitored this page for December 2022 and January and February 2023. My task was to extract and gather the abstracts to form an oversight paper giving readers an idea of the topics covered.

I found Blum to be very productive and the summary for each month ran to over 9,000 words, each a large paper in itself.

In discussion with the *Journal* it was decided to publish just one month of collected abstracts as we feel this will give readers a sufficient idea of the topics covered. Our hope is that readers will join the existing 3.8K followers of the CHIROPRACTIC page and add it to their profile.

As you can see from the attached sampling for the most recent month of February 2023, Blum manages to cover a broad range of topics largely centred on clinical reports.

I commend this page to you and trust you enjoy this review.

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Cite: Lin J. One month of abstracts from the CHIROPRACTIC page on Facebook. Asia-Pac Chiropr J. 2023;3:4 URL [apcj.net/Papers-Issue-3-4/#LinFacebookAbstracts](https://www.apcj.net/Papers-Issue-3-4/#LinFacebookAbstracts)

1. <https://www.facebook.com/groups/942306522450577>



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Clinimetric Properties of the Applied Kinesiology Manual Muscle Test in Adults With and Without Pain: A Methodological Study

Abstract

Objective: The purpose of this study was to determine the intra- and interexaminer reliability, concurrent validity, and responsiveness of the applied kinesiology manual muscle test (AK-MMT) to discriminate gluteus medius muscle strength and latency.

Methods: A cross-sectional and methodological study was conducted in 38 participants using electromyography, electrogoniometry, and hand-held dynamometry to measure latency, angular displacement, and muscle force during the assessment of the gluteus medius by AK-MMT. Inter- and intrarater reliability of 2 examiners with different levels of experience were obtained using the intraclass correlation coefficient. Muscle force, latency, and joint angular displacement were compared between groups (facilitated vs inhibited). Latency and angular displacement also were compared within groups by using the Wilcoxon paired test. For the concurrent validity of the AK-MMT in classifying an inhibited muscle as weak, the receiver operating characteristic curve was conducted.

Results: Intra- and interexaminer reliability for the facilitated vs inhibited classifications based on AK-MMT presented good results, with intraclass correlation coefficient > 0.86. For the inhibited group, force and peak force were significantly lower and joint displacement significantly greater. The receiver operating characteristic curve showed an area under the curve of 0.743, demonstrating that the test has concurrent validity (P = .001) to discriminate muscle force. The Wilcoxon paired test showed a significant delay in latency of the inhibited gluteus medius group (0.10 s vs 0.18 s, P = .007) when compared with the facilitated one.

Conclusion: In this study, we found good intra- and interexaminer reliability and concurrent validity for the AK-MMT to determine differences in gluteus medius muscle force. Although the paired data showed a different latency time between groups, the hypothesis of prolonged latency in muscles classified as inhibited by AK-MMT still needs further investigation.

Keywords: Electromyography; Kinesiology, Applied; MMT, Manual muscle test; Muscle Strength Dynamometer; Neural Inhibition; Reproducibility of Results.

Cite: Oliveira DG, Oliveira GM, Kirkwood RN. Clinimetric Properties of the Applied Kinesiology Manual Muscle Test in Adults With and Without Pain: A Methodological Study. *J Chiropr Med.* 2022 Dec;21(4):260-269. DOI 10.1016/j.jcm.2022.03.003. Epub 2022 Jul 13. PMID: 36420367; PMCID: PMC9676386.

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Chiropractic Integration into Private Sector Medical Facilities: A Multisite Qualitative Case Study

Abstract

Objectives: Chiropractic care may have value in improving patient outcomes and decreasing opioid use, but little is known about the impetus for or process of incorporating these services into conventional medical settings. The purpose of this qualitative study was to describe organizational structures, care processes, and perceived value of chiropractic integration within U.S. private sector medical facilities.

Design: Multisite, comparative organizational case study.

Settings: Nine U.S. private sector medical facilities with on-site chiropractic care, including five hospitals and four clinics.

Participants: One hundred and thirty-five key facility stakeholders including doctors of chiropractic (DCs), non-DC clinicians, support staff, administrators, and patients.

Methods: Researchers conducted 2-day site visits to all settings. Qualitative data were collected from audio-recorded, semi-structured, role-specified, individual interviews; standardized organizational data tables; and archival document review. A three-member, interdisciplinary team conducted thematic content analysis of verbatim transcripts using an existing conceptual framework and emergent codes.

Results: These nine medical facilities had unique organizational structures and reasons for initiating chiropractic care in their settings. Across sites, DCs were sought to take an evidence-based approach to patient care, work collaboratively within a multidisciplinary team, engage in interprofessional case management, and adopt organizational mission and values. Chiropractic clinics were implemented within existing human resources, physical plant, information technology, and administrative support systems, and often expanded over time to address patient demand. DCs usually were co-located with medical providers and integrated into the collaborative management of patients with musculoskeletal and co-morbid conditions. Delivery of chiropractic services was perceived to have high value among patients, medical providers, and administration. Patient clinical outcomes, patient satisfaction, provider productivity, and cost offset were identified as markers of clinic success.

Conclusion: A diverse group of U.S. private sector medical facilities have implemented chiropractic clinics, and a wide variety of facility stakeholders report high satisfaction with the care provided.

Keywords: integrative medicine, chiropractic, delivery of healthcare, interprofessional relations, organizational case studies, health services research

Cite: Lisi AJ, Salsbury SA, Twist EJ, Goertz CM. Chiropractic Integration into Private Sector Medical Facilities: A Multisite Qualitative Case Study. *J Altern Complement Med.* 2018 Aug;24(8):792-800. DOI 10.1089/acm.2018.0218. Epub 2018 Jul 17. PMID: 30016118; PMCID: PMC6909703.

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Neck pain and Headache Complicated by Persistent Syringomyelia After Foramen Magnum Decompression for Chiari I Malformation: Improvement with Multimodal Chiropractic Therapies

Abstract

Background: Patients with Arnold-Chiari Malformation I (CM-I) treated with foramen magnum decompression (FMD) can have ongoing neck pain, headaches, and other symptoms complicated by persistent syringomyelia, yet there is little research regarding treatment of these symptoms.

Case Report: A 62-year-old woman with a history of residual syringomyelia following FMD and ventriculoperitoneal shunt for CM-I presented to a chiropractor with progressively worsening neck pain, occipital headache, upper extremity numbness and weakness, and gait abnormality, with a World Health Organization Quality of Life score (WHO-QOL) of 52%. Symptoms were improved by FMD 16 years prior, then progressively worsened, and had resisted other forms of treatment, including exercises, acupuncture, and medications. Examination by the chiropractor revealed upper extremity neurologic deficits, including grip strength. The chiropractor ordered whole spine magnetic resonance imaging, which demonstrated a persistent cervico-thoracic syrinx and findings of cervical spondylosis, and treated the patient using a multimodal approach, with gentle cervical spine mobilization, soft tissue manipulation, and core and finger muscle rehabilitative exercises. The patient responded positively, and at the 6-month follow-up her WHO-QOL score was 80%, her grip strength and forward head position had improved, and she was now able to eat using chopsticks.

Conclusions: This case highlights a patient with neck pain, headaches, and persistent syringomyelia after FMD for CM-I who improved following multimodal chiropractic and rehabilitative therapies. Given the limited, low-level evidence for these interventions in patients with persistent symptoms and syringomyelia after FMD, these therapies cannot be broadly recommended, yet could be considered on a case-by-case basis.

Keywords: Arnold-Chiari Malformation, Chiropractic, Exercise Therapy, Manipulation, Spinal, Neck Pain, Therapy, Soft Tissue

Cite: Chu EC, Trager RJ, Ng GSN, Shum JSF. Neck pain and Headache Complicated by Persistent Syringomyelia After Foramen Magnum Decompression for Chiari I Malformation: Improvement with Multimodal Chiropractic Therapies. *Am J Case Rep.* 2022 Oct 31;23:e937826. DOI 10.12659/AJCR.937826. PMID: 36315459; PMCID: PMC9634848.

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Resolution of nocturnal enuresis in 9 year-old male under chiropractic care: A case report

Abstract

Objective/Clinical Features A 9-year-old male presented for chiropractic care with nocturnal enuresis (bedwetting). The child had a history of chiropractic care, but there was a significant time period from his last adjustment. During this time the bedwetting frequency had increased to

3-4 nights in a row. The child had received repetitive antibiotic prescriptions from the ages 0-7 and had injured their 'tailbone' two years previous.

Upon examination it was identified that the child was experiencing severe mental stress, high emotional stress, and moderate physical stress. Objective measures of thermal scanning, static EMG, and heart rate variability were recorded and analysed both pre and post chiropractic care.

This examination revealed a minor AHC, a high right shoulder with corresponding right foot flare and sacral torsion. Spinal Galant and ATNR reflexes were retained bilaterally, and the Palmer reflex on the right. Increased tension was noted in sub-occipital muscles, right trapezius, right rhomboid, and bilateral gluteus medius. Subluxations were identified at the levels of C3/4, C6/7, T6/7, and about the Sacrum.

Intervention/Outcomes Care followed a schedule of 2 sessions per week for 6 weeks, followed by a review. Techniques employed included Diversified Manual, Thompson and Logan Protocols. Following the review the schedule of care was revised to weekly sessions for a duration of 4 weeks. At the review it was found there was a complete resolution of nocturnal enuresis for several weeks, significant improvements in muscle tension, improvement in posture, and a reduction in subluxations at the upper cervical complex and Sacrum. Retained primitive reflexes also integrated during this course of care, with the exception of ATNR which remained positive.

Conclusion: Chiropractic care may be of assistance in the management of nocturnal enuresis.

Indexing Terms: Chiropractic; Subluxation; enuresis.

Cite: Blonigen A, Postlethwaite R, McIvor C. Resolution of nocturnal enuresis in 9 year-old male under chiropractic care: A Case Report. Asia-Pac Chiropr J. 2021;2.6. apcj.net/papers-issue-2-6/#BlonigenEnuresis.

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Improvement of Chronic Neck Pain After Posterior Atlantoaxial Surgical Fusion via Multimodal Chiropractic Care: A Case Report

Abstract

There is a lack of research regarding the effectiveness and safety of manual therapies, including spinal manipulative therapy (SMT), for patients with previous cervical spine surgery. A 66-year-old, otherwise healthy, woman who underwent C1/2 posterior surgical fusion for rotatory instability during adolescence presented to a chiropractor with a six-month history of progressive worsening of chronic neck pain and headaches despite acetaminophen, tramadol, and physical therapy. Upon examination, the chiropractor noted postural changes, limited cervical range of motion, and muscle hypertonicity. Computed tomography revealed a successful C1/2 fusion, and degenerative findings at C0/1, C2/3, C3/4, and C5/6, without cord compression. As the patient had no neurologic deficits or myelopathy and tolerated spinal mobilization well, the chiropractor applied cervical SMT, along with soft tissue manipulation, ultrasound therapy, mechanical traction, and thoracic SMT. The patient's pain was reduced to a mild level and the range of motion improved over three weeks of treatment. Benefits were maintained over a three-month follow-up as treatments were spaced apart. Despite the apparent success in the current case, evidence for manual therapies and SMT in patients with cervical spine surgery remains limited, and these therapies should be used with caution on an individual patient basis. Further research is needed to examine the safety of manual therapies and SMT in patients following cervical spine surgery and determine predictors of treatment response.

Cite: Chu E, Trager R J, Tao C (February 04, 2023) Improvement of Chronic Neck Pain After Posterior Atlantoaxial Surgical Fusion via Multimodal Chiropractic Care: A Case Report. Cureus 15(2): e34630. DOI 10.7759/cureus.34630

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Improvement in posture, sleep and energy in a 25 year old female under chiropractic care: A case report

Abstract

A 25-year old female presented for chiropractic care to address her postural concerns. She described herself as 'healthy but fatigued.'

Objective/Clinical Features: Chiropractic care for the reduction of vertebral subluxations involved special attention to the thoracic and cervical spine, where a forward head carriage was noted, and stabilising of the pelvis which was found to be tilted.

Intervention/Outcomes: Following a course of chiropractic care, objective findings confirmed a reduction in forward head carriage, an increase in pelvic stability, and was concomitant with patient reported increases in sleep quality, energy, vitality, and immune function (i.e. resistance to coughs, colds and flus)

Conclusion: In this case, an improvement in sleep, energy, vitality, and immunity was concomitant with a course of chiropractic care.

Indexing Terms: Chiropractic; Subluxation; Immunity; Fatigue; Sleep Quality.

Cite: Leahy A, Postlethwaite R, Mclvor C. Improvement in posture, sleep and energy in a 25 year old female under chiropractic care: A case report. *Asia-Pac Chiropr J.* 2022;2.5. URL apcj.net/papers-issue-2-5/#LeahyPostureSleep.

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Cervical and postural strategies for maintaining horizontal gaze in asymptomatic adults

Abstract

Purpose: To investigate the different cervical strategies for maintaining horizontal gaze in asymptomatic subjects.

Methods: One hundred and forty-four asymptomatic adults filled the SF-36 quality of life questionnaire and underwent full-body biplanar radiographs. Chin brow vertical angle (CBVA) and postural and cervical parameters were measured. Subjects were grouped according to cervical spine curvature (C2-C7 angle): kyphotic ($< -5^\circ$), straight [$-5^\circ, 5^\circ$], lordotic ($> 5^\circ$). Demographics, SF-36 component scores and CBVA were compared between groups. All other parameters were compared between groups, while controlling for confounding factors (ANCOVA). A correlation test was conducted between all cervical parameters.

Results: 32% of subjects had kyphotic ($-12^\circ \pm 7^\circ$), 27% straight ($0^\circ \pm 3^\circ$) and 41% lordotic ($12^\circ \pm 7^\circ$) cervical spines. While demographic and SF-36 data did not differ between groups, CBVA differed between lordotic and kyphotic groups (2° vs. 6.5° , $p = 0.002$). Sagittal vertical axis (SVA) and thoracic kyphosis (TK) were lower in the kyphotic group (SVA: K = -26 ± 20 mm vs. L = -2 ± 21 mm, $p < 0.001$; TK: K = $40^\circ \pm 6^\circ$ vs. L = $51^\circ \pm 8^\circ$, $p < 0.001$). C2 slope (K = $29^\circ \pm 6^\circ$ vs. L = $18^\circ \pm 6^\circ$, $p < 0.001$), C0-C2 (K = $42^\circ \pm 8^\circ$ vs. L = $30^\circ \pm 8^\circ$, $p < 0.001$) and C1-C2 (K = $33^\circ \pm 6^\circ$ vs. L = $28^\circ \pm 6^\circ$, $p = 0.004$) were higher in the kyphotic group. Significant correlations were found between almost all cervical parameters and C2-C7 angle.

Conclusions: Subjects with cervical kyphosis presented with more posterior global alignment and lower TK than subjects with lordosis. In order to maintain horizontal gaze, subjects with cervical kyphosis presented with a more lordotic upper cervical spine than subjects with cervical lordosis. Subjects with straight cervical curvature presented with an intermediate sagittal alignment.

These slides can be retrieved under Electronic Supplementary Material.

Keywords: Asymptomatic subjects; Cervical Spine; Global alignment; Horizontal gaze; Sagittal balance.

Cite: Khalil N, Bizdikian AJ, Bakouny Z, Salameh M, Bou Zeid N, Yared F, Otayek J, Kharrat K, Kreichati G, Ghanem I, Lafage R, Lafage V, Obeid I, Assi A. Cervical and postural strategies for maintaining horizontal gaze in asymptomatic adults. *Eur Spine J.* 2018 Nov;27(11):2700-2709. DOI 10.1007/s00586-018-5753-3. Epub 2018 Sep 7. PMID: 30194529.

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The effect of lumbar spinal manipulation on biomechanical factors and perceived transient pain during prolonged sitting: a laboratory-controlled cross-sectional study

Abstract

Background: Spinal manipulation has been shown to affect muscle activity, posture, and pain. To date, no studies have examined the effect of manipulation on biomechanical factors during sitting. Therefore, the purpose of this study was to investigate the immediate effect of lumbar spinal manipulation on trunk muscle activation, spine posture and movements, and perceived ratings of transient pain in asymptomatic adults during prolonged office sitting.

Methods: Twenty healthy adults were recruited for a single laboratory session that included a standardized office sitting/data entry protocol (120 min total, 3 blocks of 40 min). Data were collected between July and August 2012. The first block (baseline) was immediately followed by two experimental blocks. Prior to the start of each experimental block, participants were transferred to a therapy plinth and placed side lying (right side down), and a random presentation of either a control or high velocity low amplitude thrust directed at L4/L5 was delivered. Continuous measures of muscle activity, spine posture, and spine movements were recorded throughout the sitting trials. Perceived transient pain was measured by visual analogue scale at 10-min intervals (including immediately before and after the randomized maneuvers).

Results: There were no significant differences in spine or pelvic posture or perceived back pain following either the manipulation or control maneuvers. Significantly reduced muscle activity and increased shifts of the lumbar spine angle were identified in the block following manipulation compared to both baseline and post control blocks.

Conclusions: Spinal manipulation does not appear to have an immediate impact on spine or pelvic posture in healthy adults but does appear to reduce muscle activity and increase spine movement during sitting. Future work should replicate this study with a larger population in a field setting. It may be worthwhile to explore the implication of reduced muscle activation and increased spine movements during prolonged sitting for office workers that receive manipulations or mobilizations during their workday.

Keywords: Low back; Manipulation; Sitting; Spine movements; Spine posture.

Cite: De Carvalho DE, Callaghan JP. The effect of lumbar spinal manipulation on biomechanical factors and perceived transient pain during prolonged sitting: a laboratory-controlled cross-sectional study. *Chiropr Man Therap.* 2022 Dec 30;30(1):62. DOI 10.1186/s12998-022-00472-y. PMID: 36585725; PMCID: PMC9805135.

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Effect of a Craniosacral Therapy Protocol in People with Migraine: A Randomized Controlled Trial

Abstract

Background: Migraine is a common neurological disorder, and it is the second leading cause of disability worldwide. Manual techniques based on physical therapy have been proposed to improve migraine aspects; however, further research is needed on their effectiveness. The aim of this study was to evaluate the effectiveness of a craniosacral therapy protocol on different features in migraine patients. **Methods:** Fifty individuals with migraine were randomly divided into two groups (n = 25 per group): (i) craniosacral therapy group (CTG), following a craniosacral therapy protocol, and (ii) sham control group (SCG), with a sham treatment. The analyzed

variables were pain, migraine severity and frequency of episodes, functional, emotional, and overall disability, medication intake, and self-reported perceived changes, at baseline, after a 4 week intervention, and at 8 week follow-up. Results: After the intervention, the CTG significantly reduced pain ($p = 0.01$), frequency of episodes ($p = 0.001$), functional ($p = 0.001$) and overall disability ($p = 0.02$), and medication intake ($p = 0.01$), as well as led to a significantly higher self-reported perception of change ($p = 0.01$), when compared to SCG. In addition, the results were maintained at follow-up evaluation in all variables. Conclusions: A protocol based on craniosacral therapy is effective in improving pain, frequency of episodes, functional and overall disability, and medication intake in migraineurs. This protocol may be considered as a therapeutic approach in migraine patients.

Keywords: manual therapy; migraine; physiotherapy.

Cite: Muñoz-Gómez E, Inglés M, Aguilar-Rodríguez M, Mollà-Casanova S, Sempere-Rubio N, Serra-Añó P, Espí-López GV. Effect of a Craniosacral Therapy Protocol in People with Migraine: A Randomized Controlled Trial. *J Clin Med.* 2022 Jan 30;11(3):759. DOI 10.3390/jcm11030759. PMID: 35160211; PMCID: PMC8836770.

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Lung Cancer With Vertebral Metastases Presenting as Low Back Pain in the Chiropractic Office: A Case Report

Abstract

Lung cancer commonly metastasizes to the skeletal system, and when affecting the spine, it may initially be mistaken for a typical musculoskeletal source of back pain. We report a previously healthy 52-year-old male non-smoker with an eight-week history of low back pain that radiated into his left thigh and recent weight loss, yet no respiratory symptoms. Initially, the patient visited his primary care physician, who suspected a musculoskeletal condition and prescribed a nonsteroidal anti-inflammatory drug and muscle relaxant, then referred the patient to the chiropractor. Based on the patient's pain pattern, limited mobility, and other features, the chiropractor suspected a lumbar disc herniation. However, the patient's condition worsened during a one-week trial of care, so the chiropractor ordered magnetic resonance imaging (MRI) and, as the findings suggested vertebral metastasis, promptly referred the patient to an oncologist, who confirmed a diagnosis of lung adenocarcinoma via positron emission tomography (PET)/computed tomography and biopsy. Chiropractors should be aware of warning signs of malignancy, such as unexplained weight loss or progressive worsening despite treatment. If providers suspect spinal metastasis, they should order advanced imaging such as an MRI and refer patients to an oncologist for timely care.

Cite: Chu E, Trager R J, Lee W, et al. (February 09, 2023) Lung Cancer With Vertebral Metastases Presenting as Low Back Pain in the Chiropractic Office: A Case Report. *Cureus* 15(2): e34821. DOI 10.7759/cureus.34821

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The effectiveness of manual and exercise therapy on headache intensity and frequency among patients with cervicogenic headache: a systematic review and meta-analysis

Abstract

Background: Cervicogenic headache is a secondary headache, and manual therapy is one of the most common treatment choices for this and other types of headache. Nonetheless, recent guidelines on the management of cervicogenic headache underlined the lack of trials comparing manual and exercise therapy to sham or no-treatment controls. The main objective of this systematic review and meta-analysis was to assess the effectiveness of different forms of manual and exercise therapy in people living with cervicogenic headache, when compared to other treatments, sham, or no treatment controls.

Methods: Following the PRISMA guidelines, the literature search was conducted until January 2022 on MEDLINE, CENTRAL, DOAJ, and PEDro. Randomized controlled trials assessing the effects of manual or exercise therapy on patients with cervicogenic headache with headache intensity or frequency as primary outcome measures were included. Study selection, data extraction and Risk of Bias (RoB) assessment were done in duplicate. GRADE was used to assess the quality of the evidence.

Results: Twenty studies were included in the review, with a total of 1439 patients. Common interventions were spinal manipulation, trigger point therapy, spinal mobilization, scapulo-thoracic and cranio-cervical exercises. Meta-analysis was only possible for six manual therapy trials with sham comparators. Data pooling showed moderate-to-large effects in favour of manual therapy for headache frequency and intensity at short-term, small-to-moderate for disability at short-term, small-to-moderate for headache intensity and small for headache frequency at long-term. A sensitivity meta-analysis of low-RoB trials showed small effects in favor of manual therapy in reducing headache intensity, frequency and disability at short and long-term. Both trials included in the sensitivity meta-analysis studied spinal manipulation as the intervention of interest. GRADE assessment showed moderate quality of evidence.

Conclusion: The evidence suggests that manual and exercise therapy may reduce headache intensity, frequency and disability at short and long-term in people living with cervicogenic headache, but the overall RoB in most included trials was high. However, a sensitivity meta-analysis on low-RoB trials showed moderate-quality evidence supporting the use of spinal manipulation compared to sham interventions. More high-quality trials are necessary to make stronger recommendations, ideally based on methodological recommendations that enhance comparability between studies.

Trial registration The protocol for this meta-analysis was pre-registered on PROSPERO under the registration number CRD42021249277.

Cite: Bini, P., Hohenschurz-Schmidt, D., Masullo, V. et al. The effectiveness of manual and exercise therapy on headache intensity and frequency among patients with cervicogenic headache: a systematic review and meta-analysis. *Chiropr Man Therap* 30, 49 (2022). <https://doi.org/10.1186/s12998-022-00459-9>.

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Does vitamin D status influence lumbar disc degeneration and low back pain in postmenopausal women? A retrospective single-center study

Abstract

Objective: To investigate the relationship between serum vitamin D concentration and lumbar disc degeneration (LDD) in postmenopausal women and the epidemiologic factors affecting low back pain (LBP).

Methods: Between July 2017 and December 2018, 232 participants were retrospectively enrolled. Serum concentrations of bone turnover markers were measured using electrochemiluminescence assays. Disc degeneration was evaluated using the Pfirrmann grading system. Other variables were assessed using relevant questionnaires.

Results: The mean age of the women was 65.6 ± 10.1 and their serum 25(OH)D concentrations were 19.38 ± 9.21 ng/mL. The prevalences of severe vitamin D deficiency (<10 ng/mL) and normal status (>30 ng/mL) were 12.9% and 12.5%, respectively. The severely deficient group had higher visual analog scale (VAS) scores for LBP ($P = 0.002$) and lower bone mineral density T scores ($P = 0.004$) than the other groups. Lower 25(OH)D concentration (<10 ng/mL) was significantly associated with more severe LDD in the lumbosacral region (L4-S1, L1-S1, $P < 0.05$), but less so in the upper lumbar region. There was an inverse relationship between vitamin D concentration and the severity of disc degeneration (L2-L3, L4-S1, L1-S1, $P < 0.05$). After

adjustment for confounding factors, smoking, vitamin D deficiency, lack of vitamin D supplementation, high body mass index, and low bone mineral density T score were associated with higher incidence of moderate-to-severe pain in postmenopausal women ($P < 0.05$).

Conclusions: Vitamin D deficiency is associated with LDD and LBP in postmenopausal women. Specifically, a serum vitamin D concentration < 10 ng/mL is a marker of severe LDD and LBP. Smoking, severe vitamin D deficiency, lack of vitamin D supplementation, high body mass index, and osteoporosis are associated with a higher prevalence of moderate-to-severe pain.

Cite: Xu HW, Yi YY, Zhang SB, Hu T, Wang SJ, Zhao WD, Wu DS. Does vitamin D status influence lumbar disc degeneration and low back pain in postmenopausal women? A retrospective single-center study. *Menopause*. 2020 May;27(5):586-592. DOI 10.1097/GME.0000000000001499. PMID: 32049928.

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Chiropractic Management of chronic sinusitis and breathing difficulty in a 67-year-old male

Abstract

A 67 year old male presented for chiropractic care with a chief complaint of chronic sinusitis, post-nasal drip, breathing difficulty and generalised discomfort, from which he had suffered for ten years. ENT Specialists had failed to diagnose an underlying cause.

Intervention/Outcomes: Chiropractic care for the reduction of vertebral subluxations using the Advanced BioStructural Correction technique was concomitant with a significant improvement in sinusitis

Conclusion: Chiropractic care was concomitant with a 50-60% reduction in chronic sinusitis, and a 50% reduction in sinus medication.

Indexing Terms: Chiropractic; Subluxation; Immunity; Sinusitis.

Cite: Luc A, Postlethwaite R, Mclvor C. Chiropractic Management of chronic sinusitis and breathing difficulty in a 67-year-old male: A case report. *Asia-Pac Chiropr J*. 2022;2:5. URL apcj.net/papers-issue-2-5/#LucSinusitis.

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Multimorbidity in patients with low back pain in Danish chiropractic practice: a cohort study

Abstract

Background: People with multimorbidity, defined as the co-existence of two or more chronic conditions in an individual, often suffer from pain and functional limitations caused by musculoskeletal disorders and the chronic conditions. In chiropractic practice, two thirds of patients are treated for low back pain (LBP). It is unknown to what extent LBP is accompanied with chronic conditions in chiropractic practice. The objective was to determine the prevalence of multimorbidity among patients with LBP in chiropractic practice and to investigate if multimorbidity affects pain intensity, self-rated health, physical and mental health. Finally, to explore if individuals with multimorbidity have a different recovery for the LBP.

Methods: Patients presenting with a new episode of LBP were recruited from 10 chiropractic clinics in 2016–2018. Patient-reported data concerning socio-demographics, self-rated health, pain intensity, history of LBP, mental health and chronic conditions were collected at baseline. The prevalence of multimorbidity was determined. To evaluate differences in recovery from the LBP, we estimated changes in the Roland Morris Disability Questionnaire (RMDQ) score and use of pain medication at baseline, 2 weeks, 3 months and 12 months. The analyses were adjusted using regression models.

Results: 2083 patients were included at baseline and 71%, 68% and 64% responded to follow-up questionnaires at 2 weeks, 3 and 12 months. 1024 (49%) participants reported to have at least one chronic condition and 421 (20%) had multimorbidity (≥ 2 chronic conditions). The presence of multimorbidity was associated with increased odds of poor self-rated health (OR 2.13), physical fitness (OR 1.79), poor muscular strength (OR 1.52), poor endurance (OR 1.51), and poor balance (OR 1.33). Patients with high LBP intensity combined with multimorbidity showed a poorer recovery than patients without chronic diseases (mean difference in RMDQ score 3.53 at 12 months follow-up). More patients with multimorbidity used pain medication for LBP at 12 months follow-up compared to those without chronic disease (OR 2.36).

Conclusions: Chiropractors should be aware that patients with LBP may suffer from multimorbidity with poor general health. Patients with multimorbidity also have poorer recovery from LBP than people without chronic disease and clinical follow-up may be indicated.

Cite: Rafn, B.S., Hartvigsen, J., Siersma, V. et al. Multimorbidity in patients with low back pain in Danish chiropractic practice: a cohort study. *Chiropr Man Therap* 31, 8 (2023). <https://doi.org/10.1186/s12998-023-00475-3>.

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Association between chiropractic care and use of prescription opioids among older medicare beneficiaries with spinal pain: a retrospective observational study

Abstract

Background: The burden of spinal pain can be aggravated by the hazards of opioid analgesics, which are still widely prescribed for spinal pain despite evidence-based clinical guidelines that identify non-pharmacological therapies as the preferred first-line approach. Previous studies have found that chiropractic care is associated with decreased use of opioids, but have not focused on older Medicare beneficiaries, a vulnerable population with high rates of co-morbidity and polypharmacy. The purpose of this investigation was to evaluate the association between chiropractic utilization and use of prescription opioids among older adults with spinal pain.

Methods: We conducted a retrospective observational study in which we examined a nationally representative multi-year sample of Medicare claims data, 2012–2016. The study sample included 55,949 Medicare beneficiaries diagnosed with spinal pain, of whom 9,356 were recipients of chiropractic care and 46,593 were non-recipients. We measured the adjusted risk of filling a prescription for an opioid analgesic for up to 365 days following diagnosis of spinal pain. Using Cox proportional hazards modeling and inverse weighted propensity scoring to account for selection bias, we compared recipients of both primary care and chiropractic to recipients of primary care alone regarding the risk of filling a prescription.

Results: The adjusted risk of filling an opioid prescription within 365 days of initial visit was 56% lower among recipients of chiropractic care as compared to non-recipients (hazard ratio 0.44; 95% confidence interval 0.40–0.49).

Conclusions: Among older Medicare beneficiaries with spinal pain, use of chiropractic care is associated with significantly lower risk of filling an opioid prescription.

Cite: Whedon, J.M., Uptmor, S., Toler, A.W.J. et al. Association between chiropractic care and use of prescription opioids among older medicare beneficiaries with spinal pain: a retrospective observational study. *Chiropr Man Therap* 30, 5 (2022). <https://doi.org/10.1186/s12998-022-00415-7>.

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Symptomatic, Magnetic Resonance Imaging-Confirmed Cervical Disk Herniation Patients: A Comparative-Effectiveness Prospective Observational Study of 2 Age- and Sex-Matched Cohorts Treated With Either Imaging-Guided Indirect Cervical Nerve Root Injections or Spinal Manipulative Therapy

Abstract

Objective: The purpose of this study was to compare the outcomes of overall improvement, pain reduction, and treatment costs in matched patients with symptomatic, magnetic resonance imaging-confirmed cervical disk herniations treated with either spinal manipulative therapy (SMT) or imaging-guided cervical nerve root injection blocks (CNRI).

Methods: This prospective cohort comparative-effectiveness study included 104 patients with magnetic resonance imaging-confirmed symptomatic cervical disk herniation. Fifty-two patients treated with CNRI were age and sex matched with 52 patients treated with SMT. Baseline numerical rating scale (NRS) pain data were collected. Three months after treatment, NRS pain levels were recorded and overall "improvement" was assessed using the Patient Global Impression of Change scale. Only responses "much better" or "better" were considered "improved." The proportion of patients "improved" was calculated for each treatment method and compared using the $\chi(2)$ test. The NRS and NRS change scores for the 2 groups were compared at baseline and 3 months using the unpaired t test. Acute and subacute/chronic patients in the 2 groups were compared for "improvement" using the $\chi(2)$ test.

Results: "Improvement" was reported in 86.5% of SMT patients and 49.0% of CNRI patients ($P = .0001$). Significantly more CNRI patients were in the subacute/chronic category (77%) compared with SMT patients (46%). A significant difference between the proportion of subacute/chronic CNRI patients (37.5%) and SMT patients (78.3%) reporting "improvement" was noted ($P = .002$).

Conclusion: Subacute/chronic patients treated with SMT were significantly more likely to report relevant "improvement" compared with CNRI patients. There was no difference in outcomes when comparing acute patients only.

Keywords: Cervical Spine; Comparative-Effectiveness Research; Disk Herniation; Injections; Manipulation, Spinal; Nerve Root; Outcomes Assessment; Radiculopathy.

Cite: Peterson CK, Pffirmann CW, Hodler J, Leemann S, Schmid C, Anklin B, Humphreys BK. Symptomatic, Magnetic Resonance Imaging-Confirmed Cervical Disk Herniation Patients: A Comparative-Effectiveness Prospective Observational Study of 2 Age- and Sex-Matched Cohorts Treated With Either Imaging-Guided Indirect Cervical Nerve Root Injections or Spinal Manipulative Therapy. *J Manipulative Physiol Ther.* 2016 Mar-Apr;39(3):210-7. DOI 10.1016/j.jmpt.2016.02.004. Epub 2016 Mar 31. PMID: 27040033.

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Chiropractors in interprofessional practice settings: a narrative review exploring context, outcomes, barriers and facilitators

Abstract

To determine the added value of interprofessional interventions over existing mono-professional practice, elucidation of specific health care issues, service delivery contexts and benefits of combining multiple service provider is required. However, from existing literature, it is difficult to develop a sense of the evidence that supports interprofessional practice initiatives involving chiropractors. This review aims to describe and explore the contexts, outcomes, and barriers and facilitators relating to interprofessional practice involving chiropractors available in current literature. A search of Scopus, CINAHL, Cochrane, and Web of Science databases covering the literature from 2005 to October 2021 was conducted, after which a narrative review of identified peer-reviewed articles written in English was performed. We included data from seven studies, conducted across four distinct service delivery contexts. Eight interprofessional practice partners

were identified, and eight factors appear to act as barriers and facilitators. Data suggests that incorporating chiropractors into community health and sports medicine interprofessional practice interventions is achievable and appears to impact collaborative practice positively. For older adults with low back pain, quality of life and care-related satisfaction are potential relevant outcomes for the evaluation of interprofessional practice interventions. There is currently very limited evidence from which to judge the value of interprofessional practice interventions, as available literature appears to focus mainly on interprofessional collaboration. Studies conducted specifically to evaluate interprofessional practice solutions and addressing specific health care issues or practice domains are urgently required.

Keywords: Interprofessional practice, Chiropractic, Review

Cite: Myburgh, C., Tegllhus, S., Engquist, K. et al. Chiropractors in interprofessional practice settings: a narrative review exploring context, outcomes, barriers and facilitators. *Chiropr Man Therap.* 30, 56 (2022)

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Spinal pain in childhood: prevalence, trajectories, and diagnoses in children 6 to 17 years of age

Abstract

This study aimed to investigate the trajectories of spinal pain frequency from 6 to 17 years of age and describe the prevalence and frequency of spinal pain and related diagnoses in children following different pain trajectories. First through fifth-grade students from 13 primary schools were followed for 5.5 years. Occurrences of spinal pain were reported weekly via text messages. Children reporting spinal pain were physically evaluated and classified using International Classification of Disease criteria. Trajectories of spinal pain frequency were modeled from age 6 to 17 years with latent class growth analysis. We included data from 1556 children (52.4% female, mean (SD) baseline age = 9.1 (1.9) years) and identified 10,554 weeks of spinal pain in 329,756 weeks of observation. Sixty-three percent of children reported one or more occurrences of spinal pain. We identified five trajectories of spinal pain frequency. Half the children (49.8%) were classified as members of a “no pain” trajectory. The remaining children followed “rare” (27.9%), “rare, increasing” (14.5%), “moderate, increasing” (6.5%), or “early-onset, decreasing” (1.3%) spinal pain trajectories. The most common diagnoses in all trajectory groups were non-specific (e.g., “back pain”). Tissue-specific diagnoses (e.g., muscle strain) were less common and pathologies (e.g., fracture) were rare.

Conclusion: From childhood through adolescence, spinal pain was common and followed heterogeneous courses comprising stable, increasing, and early-onset trajectories. These findings accord with recommendations from adult back pain guidelines that most children with spinal pain can be reassured that they do not have a serious disease and encouraged to stay active.

Cite: Hébert JJ, Beynon AM, Jones BL, Wang C, Shrier I, Hartvigsen J, Leboeuf-Yde C, Hestbæk L, Swain MS, Junge T, Franz C, Wedderkopp N. Spinal pain in childhood: prevalence, trajectories, and diagnoses in children 6 to 17 years of age. *Eur J Pediatr.* 2022 Apr;181(4):1727-1736.

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Evidence that may support the claim that spinal manipulative therapy can affect the patient beyond muscle and joint pain: A systematic narrative review.

Abstract

Chiropractors are primary care providers for spinal and musculoskeletal conditions. Current literature recognises the evidence for benefits of common musculoskeletal complaints including

back and neck pain, a minority of patient visits are non-musculoskeletal in nature. The hypothesis that spinal manipulative therapy does have an effect on the patient beyond muscle and joint pain is a claim that has been scrutinised inside and outside the profession possibly due to the absence of high level evidence to support those claims. Electronic databases were searched using Mesh terms and selection criteria was met. The search yielded 23 papers, the literature was evaluated using selective critical appraisal tools. Of those, ten were randomised controlled trials, nine were systematic reviews, one was a cohort study and three were surveys. Four papers were evaluated as no evidence, 14 were evaluated as inconclusive, four papers had conclusive evidence and there was a moderate to low range of bias across all papers. The claim that SMT can affect the patient beyond muscle and joint pain cannot be substantiated due to the methodological bias and inconclusive evidence of the current literature. Improvements for future evidence quality may increase with better objective outcome measures, specified topics of research, double-blinding in randomised controlled trials and more controlled cohort studies to improve reproducibility.

Indexing Terms: Spinal manipulative therapy, non-musculoskeletal, evidence, chiropractic

Cite: McDowall C-A. Evidence that may support the claim that spinal manipulative therapy can affect the patient beyond muscle and joint pain: A systematic narrative review. *Asia-Pac Chiropr J.* 2021;1.3.URL apcj.net/mcdowall-review/.

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Association between cervical artery dissection and spinal manipulative therapy –a medicare claims analysis.

Abstract

Background: Cervical artery dissection and subsequent ischemic stroke is the most serious safety concern associated with cervical spinal manipulation.

Methods: We evaluated the association between cervical spinal manipulation and cervical artery dissection among older Medicare beneficiaries in the United States. We employed case-control and case-crossover designs in the analysis of claims data for individuals aged 65+, continuously enrolled in Medicare Part A (covering hospitalizations) and Part B (covering outpatient encounters) for at least two consecutive years during 2007–2015. The primary exposure was cervical spinal manipulation; the secondary exposure was a clinical encounter for evaluation and management for neck pain or headache. We created a 3-level categorical variable, (1) any cervical spinal manipulation, 2) evaluation and management but no cervical spinal manipulation and (3) neither cervical spinal manipulation nor evaluation and management. The primary outcomes were occurrence of cervical artery dissection, either (1) vertebral artery dissection or (2) carotid artery dissection. The cases had a new primary diagnosis on at least one inpatient hospital claim or primary/secondary diagnosis for outpatient claims on at least two separate days. Cases were compared to 3 different control groups: (1) matched population controls having at least one claim in the same year as the case; (2) ischemic stroke controls without cervical artery dissection; and (3) case-crossover analysis comparing cases to themselves in the time period 6–7 months prior to their cervical artery dissection. We made each comparison across three different time frames: up to (1) 7 days; (2) 14 days; and (3) 30 days prior to index event.

Results: The odds of cervical spinal manipulation versus evaluation and management did not significantly differ between vertebral artery dissection cases and any of the control groups at any of the timepoints (ORs 0.84 to 1.88; $p>0.05$). Results for carotid artery dissection cases were similar.

Conclusion: Among Medicare beneficiaries aged 65 and older who received cervical spinal manipulation, the risk of cervical artery dissection is no greater than that among control groups.

Keywords: Cervical spine, Spinal manipulation, Cervical artery dissection, Vertebral artery dissection, Carotid artery dissection; ischemic stroke, Chiropractic

Cite: Whedon, J.M., Petersen, C.L., Li, Z. et al. Association between cervical artery dissection and spinal manipulative therapy –a medicare claims analysis. *MC Geriatr* 22, 917 (2022).

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Spondylodiscitis Presenting to a Chiropractor: A Case Report and Literature Review

Abstract

An 80-year-old man under combination therapy for pulmonary tuberculosis presented to a chiropractor with a one-month history of worsening chronic low back pain, yet denied having any respiratory symptoms, weight loss, or night sweats. Two weeks prior, he saw an orthopedist who ordered lumbar radiographs and magnetic resonance imaging (MRI), showing degenerative changes and subtle findings of spondylodiscitis, but was treated conservatively with a nonsteroidal anti-inflammatory drug. The patient was afebrile, yet considering his older age and worsening symptoms, the chiropractor ordered a repeat MRI with contrast, which revealed more advanced findings of spondylodiscitis, psoas abscesses, and epidural phlegmon, and referred the patient to the emergency department. A biopsy and culture confirmed *Staphylococcus aureus* infection and were negative for *Mycobacterium tuberculosis*. The patient was admitted and treated with intravenous antibiotics. We conducted a literature review revealing nine previously published cases of patients with spinal infection presenting to a chiropractor, who were typically afebrile men with severe low back pain. Chiropractors rarely encounter patients with undiagnosed spinal infections and should manage those suspected of infection with urgency via advanced imaging and/or referral.

Cite: Chu E, Trager R J, Goh S, et al. (February 26, 2023) Spondylodiscitis Presenting to a Chiropractor: A Case Report and Literature Review. *Cureus* 15(2): e35491. DOI 10.7759/cureus.35491.

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Bilateral Cellulitis Presented As Lower-Extremity Pain Reported in a Chiropractic Clinic: A Case Report

Abstract

Bilateral lower-extremity cellulitis is a rare but serious condition that can lead to long-term health complications if left untreated. Herein, we report a case of a 71-year-old obese male with a two-month history of lower-extremity pain and ankle swelling. Magnetic resonance imaging (MRI) revealed the presence of bilateral lower-extremity cellulitis, which was confirmed through blood culture by the patient's family doctor. The patient's initial presentation of musculoskeletal pain, limited mobility, and other features coupled with MRI findings served as indications for timely referral to the patient's family doctor for further evaluation and management. Chiropractors should be aware of the warning signs of infection and the importance of advanced imaging for diagnosing such cases. Early detection and prompt referral to a family doctor for care can help prevent long-term health complications associated with lower-extremity cellulitis.

Cite: Chu E, Lai C, Huang K S, et al. (February 25, 2023) Bilateral Cellulitis Presented As Lower-Extremity Pain Reported in a Chiropractic Clinic: A Case Report. *Cureus* 15(2): e35470. DOI 10.7759/cureus.35470.

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