

Evidence Review



Topic: On the efficacy of spinal manipulative therapy for low back pain

Background



The World Federation of Chiropractic has defined chiropractic as "A health profession concerned with the diagnosis, treatment and prevention of mechanical disorders of the musculoskeletal system, and the effects of these disorders on the function of the nervous system and general health. There is an emphasis on manual treatments including spinal manipulation or adjustment."

Modern chiropractic was founded in 1895 by Daniel Palmer, a grocer. Three years later Palmer founded the Palmer College of Chiropractic in Davenport, Iowa. In the early history of this alternative care modality, chiropractors believed that psychic energy, a force beyond human understanding, flowed from the brain, through the nerves, to all parts of the body and that interference with this force resulted in disease. In 1953 chiropractic theory was updated to state that the health of body tissues is dependent on nerve impulses, and that interference in the nerve impulses causes disease.

Today, one should be cognoscente of the fact that chiropractors may differ in their practice. Chiropractors who are members of the International Chiropractors Association believes that patients should be treated by spinal manipulation alone, whereas the American Chiropractors Association advocates a multidisciplinary approach that combines spinal adjustment with other modalities such as physical therapy, psychological counselling, and dietary measures.

Up until the past few decades, the chiropractic profession

was rejected by conventional medicine. For example, the American Medical Association opposed chiropractic because of what it termed a "rigid adherence to an irrational, unscientific approach to disease." However, since the 1970s governments and medical associations have modified their positions on chiropractic to one that is more inclusive due to emerging positive scientific data and growing public acceptance.

To become a doctor of chiropractic (D.C.) in Canada requires a minimum 3 years of university and 4 to 5 years at one of the two chiropractic education institutes.

Chiropractic services utilization and costs

Chiropractic is the 3rd largest primary care healthcare profession in Canada, behind medicine and dentistry. According to the Statistics Canada report *Use of Alternative Health Care* (Health Reports, Vol. 16, Number 2), on average 11% of Canadians reported seeing a chiropractor in 2003. Albertans recorded the highest utilization of chiropractic service, where 17.8% of the population (461,000 individuals) had at least one consultation with the 830 licensed chiropractors in the province. Incidentally, chiropractic use is lowest in the four maritime provinces (range: 3.9% to 4.7% of population).

Doctors of Chiropractic are primary care/primary contact health care professionals; no referral is necessary to consult a chiropractor. Among all individuals who received manipulation therapy, the Statistics Canada report found that 36% cited chronic back problems and 22% reported arthritis/rheumatism as the reason for seeing a chiropractor.

The Alberta Health Care plan currently pays \$13.25 per visit to a chiropractor, with a limit of \$200 per year (approximately 15 visits). Employer health care plans

often include chiropractic coverage as do many 'private' insurance plans.

Chiropractic therapy and low back pain

Chiropractic therapy is based on the notion that restricted spine movement may lead to pain and functional limitations. Spinal adjustment (manipulation) is the primary form of therapy chiropractors use to treat restricted spinal mobility (other methods including massage, stretching, ultrasound, electrical muscle stimulation and exercise). The term spinal manipulative therapy includes both manipulation and mobilization treatments, which are distinguished based on the amount and velocity of force applied onto the spine ¹.

The goal of chiropractic treatment is to restore spinal movement and, consequently, improve function and decrease back pain. The ability of manipulation therapy to reduce back pain is a leading reason for consultation with a chiropractor. Low back pain (LBP; also referred to as lumbar pain or backache) is a pervasive and costly ailment in Canadian society. LBP is characterized as a tingling or burning sensation, a dull ache or sharp pain radiating from the lower back. LBP is believed to affect 70 to 85% of all people at some time in life ², and a recent report has found that over 20% of Canadians over the age of 20 suffer from LBP every year. Back pain is the second leading cause for GP visits and individuals with LBP utilize significantly more healthcare resources each year than those without back pain ³.

Is chiropractic therapy more effective in treating LBP compared to standard therapies, such as general practitioner care, physiotherapy and exercises? Is the effectiveness of chiropractic therapy dependent on the acute or chronic nature of back pain? This review aims to answer these questions through a thorough literature search and a critical assessment of the best available evidence on this subject.

Review Design

The approach of this review was to identify an appropriate Cochrane review on chiropractic therapy for LBP. Next, using the review's search strategy and inclusion/exclusion criteria, relevant RCT studies published subsequent to the Cochrane review will be identified. Selected studies must pass methodological quality control assessment (discussed below) in order to be included in this review. This topic review will summarize the findings of the Cochrane review and of the additional selected studies on chiropractic therapy for LBP.

Search Strategy

A search of the Cochrane Database of Systematic Reviews was conducted with the following search strategy:

chiropractic.mp. Limited to Systematic Reviews

The following review was identified:

Assendelft et al. (2003). Spinal manipulative therapy for low-back pain.

Note: The Assendelft et al. (2003) meta-analysis searched literature up to 2002.

Study inclusion criteria

The selection criteria describe by the Assendelft et al review is as follows: Only truly randomized RCTs on at least one clinically relevant outcome measure (pain, function, etc) of spinal manipulation therapy for LBP were selected. Outcome measures had to be recorded at follow-up of at least one day. A distinction was made for the duration (acute < 6 weeks; chronic > 12 weeks) of LBP. Studies that used quasi-randomization methods (e.g., birthdays) or did not disclose randomization method were excluded.

RCTs in MEDLINE, EMBASE and CINAHL were searched using the following search strategy:

```
(chiropract* OR manipulat*) AND (spinal OR back) AND (outcome OR measure) AND (RCT OR "randomized controlled") NOT review[pt] AND English[la] AND 2003:2006[pdat]
```

Note: The literature search was limited to RCT studies published in 2003 or later and, therefore, not included in the Assendelft et al systematic review.

Studies included

- Geisser ME, Wiggert EA, Haig AJ, Colwell MO. 2005. A randomized, controlled trial of manual therapy and specific adjuvant exercise for chronic low back pain.
- Hoiriis KT, Pflieger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. 2004. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain.
- Hurley DA, McDonough SM, Dempster M, Moore AP, Baxter GD. 2004. A randomized clinical trial of manipulative therapy and interferential therapy for acute low back pain.
- Licciardone JC, Stoll ST, Fulda KG, Russo DP, Siu J, Winn W, Swift J Jr. 2003. Osteopathic manipulative treatment for chronic low back pain: a randomized controlled trial.
- Niemisto L, Lahtinen-Suopanki T, Rissanen P, Lindgren KA, Sarna S, Hurri H. 2003. A randomized trial of combined manipulation, stabilizing exercises, and physician consultation compared to

physician consultation alone for chronic low back pain.

- Aure OF, Nilsen JH, Vasseljen O. 2003. Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up.
- Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG. 2003. Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies. *Cochrane Systematic Review*.

Studies excluded

- Haas M, Group E, Kraemer DF. 2004. Dose-response for chiropractic care of chronic low back pain
- Rasmussen-Barr E, Nilsson-Wikmar L, Arvidsson I. 2003. Stabilizing training compared with manual treatment in sub-acute and chronic low-back pain.

Quality control

The quality of the six selected RCT studies was assessed by an independent reviewer. Study quality was measured using a validated scale⁴ that considers the RCT design, randomization, blinding, data collection and statistical analysis procedures that minimize biases. All included studies were found to have good methodologic quality and, therefore, were incorporated into this review.

Results

One systematic review (39 RCTs, 5486 patients) along with six subsequent RCTs (839 patients) which reported on patient outcomes following spinal manipulative therapy for LBP were included in this review. In their Cochrane systematic review, Assendelft et al.⁵ cited the fact that many RCTs and systematic reviews conducted on this topic were heterogeneous in size, design, and quality, and often provided discordant conclusions. To avoid these inadequacies, Assendelft et al. followed the guidelines developed by the Cochrane Back Review Group⁶. Our review follows the search strategy and study inclusion/exclusion criteria of the Cochrane systematic review. In addition, since the results of the Cochrane review were stratified based on acute and chronic LBP, our RCT search and analysis also factored this into our review.

Acute LBP

Assendelft et al.⁵ found that, compared to sham (fake) therapy, patients who received spinal manipulative therapy had significant improvements in LBP. However, compared to any advocated conventional therapy (e.g., analgesics, exercises,

physical therapy), spinal manipulation was found to offer no significant difference on pain outcome. In a subsequent RCT conducted by Hoiriis et al.⁷ the effectiveness of spinal manipulation (given over a 2 week course) was compared to placebo medication on acute LBP in a sample of 192 patients. That study concluded that chiropractic adjustment significantly reduces pain at 2 and 4 weeks follow-up compared to placebo, although this improvement was not observed on disability and flexibility scores. Hurley et al.⁸ compared the effectiveness of manipulative therapy with inferential therapy (electrotherapeutic treatments used in physiotherapy) on pain, functional disability and quality of life (SF-36) outcomes in 240 LBP patients. Their findings further support the conclusions reached in the Assendelft et al. review; improvements in pain, functional ability and quality of life following manipulative therapy are not significantly different than outcomes obtained via physical therapy (an advocated therapy). In addition, Hurley et al. found that these improvements were maintained at 6 and 12 months after therapy.

Chronic LBP

The systematic review⁵ found that spinal manipulative therapy reduced pain in the short (< 6 weeks) and long term (> 6 weeks) when administered to patients with chronic LBP compared to sham therapy. However, improvements observed in pain and function following manipulative therapy did not differ compared to improvements gained through general practitioner care, physical therapy or exercise. The first subsequent RCT⁹ (49 patients) compared manipulative therapy with exercise therapy over 2 months (16 treatments) and concluded that spinal adjustment significantly decreased pain and increased functioning at 12 months compared to the exercise therapy group. Another RCT¹⁰ (91 patients, 66 assessed at 6 months follow-up) compared three treatments: manipulation therapy, sham therapy, and no intervention. This study found that, compared to no intervention control subjects, patients who received manipulative therapy had improvements in back pain, functioning, and mental health at 1 month follow-up, and fewer cotreatments at 6 months. Interestingly, patients who received sham therapy also had the same improvements when compared to the control subjects. No significant differences in the patient outcomes were observed between manipulative and sham therapies. It may be that other aspects of manipulative therapy, such as range of motion activities or patient interaction, may be the beneficial source of this therapy rather than the actual adjustment techniques. Next, Niemisto et al.¹¹ examined the effectiveness of combined manipulative therapy, stabilizing exercises and physician consultation with only physician

consultation on pain, disability, quality of life and cost measures in a study with 204 patients. That study found that at 5- and 12-month follow-ups, the manipulative therapy group had significant reductions in pain and disability, but no differences in health-related quality of life and costs compared to the consultation group. Finally, a recent RCT¹² with 72 chronic LBP patients compared the effectiveness of manipulative therapy versus sham therapy on pain and function, with both groups receiving adjuvant exercise (stretching and aerobic conditioning). This study found that the manipulative therapy group had significantly reduced pain compared to the sham group, but no difference in perceived function. The lack of difference in function scores between manipulative therapy patients and sham treatment patients is consistent with the findings of Licciardone et al., and suggests that psychological or other factors may contribute to disability in patients with chronic LBP.

Conclusion

The findings of the systematic review and subsequent RCTs suggest that the reduction of pain observed in acute and chronic LBP patients following manipulative therapy is significantly greater than sham treatment effects. This finding was not observed in the Licciardone et al. study, which could be due to the fact that osteopathic physicians administered the manipulative therapy in the study compared to the use of trained chiropractors in all other studies. A generally consistent finding of the selected studies is that spinal manipulative therapy does not provide greater pain reduction in acute or chronic LBP patients when compared head-on to other advocated therapies such as medication, exercise and physical therapy. Moreover, there is evidence that the benefits of manipulative therapy are maintained at one year following treatment.

Summary

- Chiropractic therapy provides pain reduction and improves function in patients who suffer acute or chronic LBP
- Chiropractic therapy is no more or no less effective than advocated therapies for LBP

Limitations

Although chronic LBP was defined by the systematic review and subsequent studies as pain lasting 12 consecutive weeks or longer, there was no attempt to categorize the length of chronic pain on manipulation therapy outcomes. For example,

difference to treatment may differ for patients who have LBP for 3 months versus 3 years. Furthermore, a publication bias is present as only studies published in English were selected.

Potential conflict of interest

None known

Reference List

- 1 Chiradejnant, A. *et al.* (2003) Efficacy of "therapist-selected" versus "randomly selected" mobilisation techniques for the treatment of low back pain: a randomised controlled trial. *Aust. J. Physiother.* 49, 233-241
- 2 Andersson, G.B. (1999) Epidemiological features of chronic low-back pain. *Lancet* 354, 581-585
- 3 Lim, K.L. *et al.* (2006) A population-based analysis of healthcare utilization of persons with back disorders: results from the Canadian Community Health Survey 2000-2001. *Spine* 31, 212-218
- 4 van Tulder, M. *et al.* (2003) Updated method guidelines for systematic reviews in the cochrane collaboration back review group. *Spine* 28, 1290-1299
- 5 Assendelft, W.J. *et al.* (2003) Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies. *Ann. Intern. Med.* 138, 871-881
- 6 van Tulder, M.W. *et al.* (1997) Method guidelines for systematic reviews in the Cochrane Collaboration Back Review Group for Spinal Disorders. *Spine* 22, 2323-2330
- 7 Hoiriis, K.T. *et al.* (2004) A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. *J. Manipulative Physiol Ther.* 27, 388-398
- 8 Hurley, D.A. *et al.* (2004) A randomized clinical trial of manipulative therapy and interferential therapy for acute low back pain. *Spine* 29, 2207-2216
- 9 Aure, O.F. *et al.* (2003) Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up. *Spine* 28, 525-531
- 10 Licciardone, J.C. *et al.* (2003) Osteopathic manipulative treatment for chronic low back pain: a randomized controlled trial. *Spine* 28, 1355-1362
- 11 Niemisto, L. *et al.* (2003) A randomized trial of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain. *Spine* 28, 2185-2191
- 12 Geisser, M.E. *et al.* (2005) A randomized, controlled trial of manual therapy and specific adjuvant exercise for chronic low back pain. *Clin. J. Pain* 21, 463-470

Our vision

*is a standard of bone and joint health and health care that is **the best in the world** – a standard **others will want to emulate.***

Our mission

*is to be the leading agent for **continuous improvement in bone and joint health and health care.***

About the Alberta Bone & Joint Health Institute:

The ABJHI is a not-for-profit organization dedicated to creating and maintaining a standard of bone and joint health and health care that is the best in the world. In pursuing this standard, the ABJHI creates knowledge through excellent research and evaluation, and translates this knowledge by interpreting it for and sharing it with health care providers and the public. This publication is a product of knowledge translation.

Article Distribution:

This publication is available at www.albertaboneandjoint.com in Portable Document Format (PDF).

Disclaimer:

This publication has not been peer-reviewed and may not reflect all available literature findings on the subject.

The work and conclusions expressed in this publication are the product of the author(s) and do not necessarily reflect the views of the members or the Board of Directors of the ABJHI.

Copyright:

Copyright © 2006 Alberta Bone and Joint Health Institute. All rights reserved. The contents of this article are copyrighted by ABJHI. No part of this article may be used for any purpose other than personal use. Therefore, reproduction, modification, storage or retransmission, in any form or by any means, electronic, mechanical or otherwise, for reasons other than personal use, is strictly prohibited without prior written permission.

Enquiries and Contact Information:

Kursat Barin, Information Analyst
Email: akbarin@albertaboneandjoint.com

