

Spinal manipulation for chronic low back pain: a review of the evidence

Howard Vernon, DC, FCCS(C)*

Our understanding about spinal manipulation and low back pain has been advanced greatly in recent years. While the first descriptive report on manipulation and low back pain can be dated to 1930 (Riches)¹ and while the first reported clinical trial appeared in 1971 (Siehl et al.)² the majority of clinical trials have been published since 1975. As well, the majority of focused, analytical studies which have addressed the short-term effects and the potential mechanisms involved in manipulation have been published in the past decade.

Several major reviews of clinical trials of manipulation for LBP and two meta-analyses have appeared within the last five years. Shekelle et al.³ reviewed 22 RCT's in 1991, while their 1992 meta-analysis⁴ included 7 high-quality clinical trials. Anderson et al.'s 1992 meta-analysis⁵ included 23 trials. Bronfort⁶ descriptively reviewed 25 RCT's and 14 non-randomized comparative studies in 1993, while Koes et al.'s 1995 report⁷ included 30 RCT's. A recent monograph by Van Tulder⁸ reviewed 9 RCT's of manipulation for chronic low back pain.

Most of these trials involved acute or sub-acute low back pain, a fact which figured prominently in the development of the recent guidelines for the management of acute low back pain in the US⁹ and in the UK.¹⁰ These panels found that sufficient evidence existed to recommend spinal manipulation as "established" as a treatment for acute low back pain without radiculopathy within the first month of symptoms. Evidence for the efficacy of spinal manipulation in the treatment of acute low back pain with disc herniation with or without radiculopathy exists, but was deemed less substantial.

The natural history of acute low back pain episodes is reasonably well known⁹ and the majority of sufferers can expect a resolution of their condition within 6-8 weeks.

Manipulation appears to hasten recovery in a majority of subjects who have received it in these clinical trials. While only a small minority of back pain sufferers fail to achieve resolution of their painful episode, those who go on to become chronic pain sufferers represent an enormous burden on the health care system and on society as a whole.¹¹ The role of spinal manipulation in this challenging area has been explored by a considerable number of studies, including 11 randomized clinical trials (two of which combined acute and chronic complaints) and at least 4 non-randomized studies. These will be reviewed in the remainder of this report.

Evans et al.'s study in 1978¹² was the first to explicitly address back pain sufferers with more long-standing pain, albeit with a small sample size ($n = 32$). In a cross-over design, 17 subjects received spinal manipulation first, then "usual" medical care with analgesics, while 15 subjects received the reverse protocol. Statistically significant reduction of pain and increase of lumbar flexion was obtained in the first group during the SMT phase as compared to the second group in the analgesic phase. Responders tended to have longer durations of pain.

In Coxhead et al.'s report,¹³ a large number of chronic subjects ($n = 322$) with low back pain (including some with sciatica) were randomly allocated to 16 different treatment combinations comparing traction, SMT, exercise and corsets. At 4 weeks, while 78% of all subjects reported improvement, greater reductions in perceived pain were reported by those in the SMT group. Their factorial analysis confirmed that combinations of SMT and exercise produced the optimal result.

Hoehler et al.¹⁴ studied 95 low back pain subjects by randomly allocating them to two treatment groups - SMT vs soft tissue massage. The SMT group obtained greater improvements in pain, disability rating and straight leg raising after one treatment, while, at three weeks after discharge, the greater pain reduction with SMT remained statistically significant.

Gibson et al.¹⁵ compared SMT in chronic LBP patients to active and detuned diathermy ($n = 109$). No significant

* Associate Dean of Research, Canadian Memorial Chiropractic College, Toronto, Ontario, Canada M4G 3E6. Presented at Chronic Low Back Pain: controversies and myths; at the Rehabilitation Institute of Chicago, Chicago IL, June 10-11, 1996.

differences in pain and trunk flexion scores were obtained at 2, 4 and 12 weeks.

Arkuszewski¹⁶ randomly allocated 50 chronic LBP patients to each of two groups: standard medical care plus SMT and standard medical care alone. Using a global score which combined posture, gait, pain, ROM and neurologic exam findings, the SMT group demonstrated statistically significant improvement at 4 and 24 weeks.

Waagen et al.,¹⁷ in the first trial by chiropractors of their particular form of SMT, compared active manipulation to a sham procedure in a total of 29 subjects with LBP of longer than 3 weeks duration. The SMT group achieved statistically greater reductions in pain post-treatment and at 2 week follow-up than the controls. Scores on a global index of spinal ROM and SLR were also significantly better in the SMT group at 2 week follow-up.

Ongley et al.¹⁸ compared SMT plus "proliferant injections" to sham SMT and placebo injections in 81 LBP patients who were unresponsive to previous care. Outcomes consisted of the Roland-Morris disability scale and the pain VAS. The active treatment group demonstrated 40% greater improvements at 4, 12 and 24 weeks (statistically significant).

Postacchini et al.¹⁹ randomly allocated 398 acute and chronic LBP patients to six different treatment groups, including chiropractic manipulation, diclofenac, massage plus diathermy, bed rest, back school and placebo ointment. While SMT was found to be the superior treatment in acute cases, and while, in chronic patients it was found to be equal to diclofenac, and better than placebo, it was less effective than physiotherapy and back school, particularly at 8 and 24 weeks post-treatment.

Koes et al.^{22,23} compared manual therapy to physiotherapy, usual medical care and placebo treatments in 256 low back pain patients. The groups receiving manual therapy and physiotherapy fared better than the medical and placebo groups on pain and "global perceived effect" scales at 3, 6 and 12 weeks.

Finally, the recent study by Triano et al.²⁴ compared chiropractic manipulation to sham manipulation and to a back education program. Significantly greater pain reduction was found in the SMT group as compared to the back education group after two weeks of treatment. No difference between groups were found on Oswestry Index scores although a trend favouring chiropractic SMT was shown.

Van Tulder⁸ recently reviewed 9 RCT's for chronic low back pain, one of which (not reviewed here) was a single-

treatment analytic study. Of the eight full-scale studies, 6 were judged to be positive and 2 negative. The two studies which scored the highest quality on standard RCT rating scales were positive for comparisons of manipulation with placebo. Van Tulder concluded that there was moderately strong evidence that manipulation was better than usual medical care, analgesics, bed rest and massage and possibly better than back education for chronic LBP. In one study^{22,23} no difference was found between manipulation and high quality physiotherapy without manipulation, although Meade et al.^{20,21} found a consistent difference favouring chiropractic as compared to physiotherapist-delivered manipulation. Finally, several studies^{13,16,18} found that manipulation in combination with exercises, "proliferant" injections or analgesics was superior to other approaches.

In non-randomized studies with chronic back pain patients, Chrisman et al.²⁵ reported greater success with manipulation as compared to a control treatment in the treatment of chronic disc herniations (33% vs 73% went on to surgery). The landmark study by Kirkaldy-Willis, and Cassidy²⁶ provided strong support for the value of manipulation in the treatment of chronic lumbar facet and sacroiliac syndrome as well as evidence that manipulation could be helpful in the management of at least some cases of lumbar instability, lateral entrapment syndrome and even central stenosis. A subsequent study by Mierau et al.²⁷ showed that the minority of subjects in the original study who had spondylolisthesis fared no poorer than those with normal lumbosacral structure. Both Bronfort²⁸ and Cherkin and MacCormack²⁹ demonstrated higher levels of patient satisfaction in chronic low back pain patients who received chiropractic as compared to medical care.

As numerous authors^{3,5,6,8,30} have indicated, the quality of the RCT's for manipulation in chronic LBP varies, although no less so than for many other conventional treatments. Typical methodologic deficiencies include: lack of full observer blinding, less than acceptable drop-out rates, failure to compare drop-outs with compliers, failure to reduce co-interventions and inappropriate statistical testing. As well, the definition of "chronic" duration of low back pain varies with few studies involving greater than 3 months duration.

The clinical trials of the future will need to make improvements in these areas in order to improve the credibility and applicability of their conclusions. As well, most of the RCT's have been at the lower level of clinical management, comparing short courses of manipulation to other

somewhat limited modalities and approaches. The clinical trials of the future should incorporate optimal management strategies devised by chiropractors, with emphasis on manipulation, as compared to optimal rehabilitation strategies emphasizing rehabilitation or cognitive/behavioral approaches to chronic back pain. Factorial designs may reveal truly optimal combinations and algorithms of care in order to maximize the therapeutic yield in this challenging area of musculoskeletal health care.

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