Chiropractic Neurology Research Brief

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Spinal Manipulative Therapy for Low Back Pain

Introduction

Chiropractic manipulative therapy (CMT) has gained the attention of the medical and research communities, because substantial evidence has been found validating its efficacy for acute and the long-term treatment of low back pain (LBP). From 1993-2002, at least 43 randomized, controlled trials of spinal manipulation have been performed for acute, sub-acute and chronic LBP. 30 of these studies favor spinal manipulation over comparison treatments, 13 studies found no significant difference and not one study has found spinal manipulation to be statistically or clinically less effective than the comparison treatment. (1) CMT could be rising to be the most studied intervention for LBP.

Government-sponsored studies in the United States, Canada and New Zealand have recommended spinal manipulation for the treatment of LBP. (2-4) In 1994, the Agency for Health Care Policy and Research, a division of the U.S. Department of Health and Human Services, appointed a panel of experts to review over 3,000 studies on treatments for acute LBP and found that spinal manipulation was one of the recommended treatments. (2)

Research Comparing CMT to Physical Therapy and Medicine

CMT has benefits beyond short-term relief of mild-to-moderate LBP. Comparing chiropractic and hospital outpatient treatment of LBP, the authors concluded that chiropractic treatment was more effective, especially for patients with chronic or severe pain. (5) At the three-year follow-up, the chiropractic group had a 29 percent advantage in Oswestry (disability) scores compared to the hospital group. (6)

A trial of 256 patients with non-specific low back and neck complaints compared spinal manipulation and physiotherapy (PT) of exercises, massage, heat, electrotherapy, ultrasound and shortwave diathermy, which I render, to that which a general practitioner rendered (analgesics, NSAIDs, advice about posture, home exercises, and bed rest) and placebo (detuned shortwave diathermy and ultrasound). CMT and PT were superior to the general practitioner and placebo groups, and at the 12-month follow-up, the manipulation group demonstrated greater improvement in the main complaint and physical functioning compared to PT. (7)

A 1998 *New England Journal of Medicine* study compared CMT, PT and an educational pamphlet for the treatment of LBP. Although the authors concluded that chiropractic and PT showed little benefit compared to the educational pamphlet, a closer look at the data found that the chiropractic group's subjects had worse histories, pain intensities and daily living and work activity risk factors. At the four and 12 week follow-ups, in spite of an unfavorable baseline, the chiropractic group fared better in terms of pain and disability and produced a significant decrease in the use of pain medication compared to the other groups (18 percent in the chiropractic group, 27 percent in the PT group, and 32 percent in the pamphlet group). At the 11-month follow-up, a smaller percentage of the chiropractic subjects lost time from work, required bed rest, and had limited daily living activity compared to the PT and pamphlet groups. (8)

A randomized controlled trial of one hundred fifteen patients with chronic spinal pain (greater than 13 weeks duration) were assigned to receive either NSAIDs (Celebrex, Vioxx, or paracetamol), acupuncture or CMT twice a week for nine weeks (9). By the end of the study, CMT achieved the best overall results with the highest proportion of patients receiving early and complete relief (27.3 percent) compared to acupuncture (9.4 percent) and medication (5 percent). The chiropractic group had a 50 percent improvement in back pain intensity compared to acupuncture (15 percent) and medication (0 percent) and neck and low back ranges-of-motion were dramatically increased. A notable finding is that the chiropractic patients had the highest average duration of chronic pain (8.3 years) versus the acupuncture group (6.4 years) and the medication group (4.5 years). One of the study's most remarkable finding was the chiropractic group reported a 47 percent improvement in "overall health" compared to 15 percent for the acupuncture group and 18 percent for the medication group.

CMT's Mechanism, Stabilization and Exercise Protocol

CMT modulates pain at the zygapophyseal joints by causing a decrease in paraspinal hyperalgesia in subjects with symptoms and increase in paraspinal muscle pain thresholds in subjects with no symptoms. (10-13) CMT stimulates joint mechanoreceptors and inhibits second order neurons in the dorsal horn of the spinal cord which transmit nociception to the Limbic center of pain perception in the brain. (14)

CMT, also, stimulates muscle reflexes. (15-18) Colloca et al. found that 95 percent of subjects' mechanoceptors of discoligamentous and muscular afferent nerve fibers were affected. (17) Herzog et al. states: "Because reflex pathways are evoked systematically during spinal manipulative treatment, there is a distinct possibility that these responses may cause some of the clinically observed beneficial effects, such as a reduction in pain and a decrease in hypertonicity of muscles." (16)

Another study investigated the effects of paraspinal muscle strength following spinal manipulative therapy. 40 subjects were assessed for trunk muscle strength by performing maximum voluntary contraction isometric trunk extensions while lying prone. The subjects received instrument-assisted SMT, sham manipulation or neither (control).

Spinal manipulation produced a significant increase in EMG erector spine isometric muscle output and trunk muscle strengths increased 21 percent. (19)

Several studies have shown that manipulation can increase spinal ranges-of-motion. (20-24) In Orthopedics, better lumbar sagittal (anterior to posterior) stability following lumbar spinal fusion produces better post-surgical outcomes. (25)

In Chiropractic, lumbar extension traction has been shown to increase the lumbar lordosis (normal, forward-arching curve) in chronic LBP patients with hypolordosis (flattening of the forward curve). (26) 48 patients with chronic LBP were matched for sex, age, height, weight, and pain scores with 30 control subjects. The treatment group received lumbar spinal manipulation in the first few weeks for short-term pain relief, then sessions of 3-point lumbar extension traction three to four times per week for 12 weeks. Pain scores and radiographic measurements did not change in the control group, but in the extension traction group, pain scores decreased from 4.4 to 0.6 on a scale of 1-10.

Radiography showed statistical improvements in lumbar lordotic and sacral angles increases. 34 of 38 of the subjects were evaluated for 17.5 months long-term follow-up and ALL 34 subjects maintained an improved lumbar lordosis. This chiropractic method of lumbar lordosis exercising appears to be the first conservative procedure to increase the lordosis in chronic LBP patients for an extended period of time.

Discussion

Improving "overall health" from better spinal functioning by balancing loads which decreases aberrancy on spinal tissues is a paradigm of Chiropractic Neurology's practice guidelines and philosophy. CMT has been found to be an effective treatment for low back pain in numerous studies and should be recommended for patients with both acute and chronic low back pain.

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