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Manual therapy

To treat or not to treat: new evidence for the effectiveness of manual therapy

M M Sran

Manual therapy has been shown to be effective for certain conditons but more research is needed to identify other suitable patients

Recent randomised clinical trials found manual therapy to be more effective than other methods of conservative management for low back and neck pain.[1–5] On the other hand, some randomised clinical trials,[6–13] systematic reviews,[14] and meta-analyses[15] concluded that there was no evidence that spinal manipulative therapy is superior to other standard treatments for patients with low back or neck pain. This provides the clinician with a Shakespearean quandary—to treat or not to treat using manual therapies? Therefore this leader addresses the question: what explains these apparently inconsistent data?.

DEFINITIONS AND SEARCH STRATEGY

The term manual therapy has many connotations, but for this leader it includes manually performed assessment and treatment methods (which can include joint, neural tissue, and/or muscle techniques). The term manipulation is typically used to describe small amplitude thrust techniques performed with speed.[16]

I searched Medline, Cinahl, and Embase databases for randomised clinical trials comparing spinal manual joint techniques (mobilisation with or without manipulation) or manipulation only with other conservative treatments for back or neck pain. Only studies published as full papers, in English, between 1 January 1998 and 31 December 2003 were included. Pilot studies were not included. Table 1 outlines search strategies for each database. Thirteen studies met the criteria (table 2). One study of bone setting by Finnish folk healers who lacked formal education[17] was excluded as all other studies involved formally educated professionals.

Examining the trials for homogeneity revealed that the mean age of participants was similar among the studies and most participants were white (except for two studies[6 11]). Thus factors related to the population studied did not appear to explain the conflicting results. There were, however, at least four factors that differed among the interventions that constituted manual therapy, and I focus on these differences to see whether they explain the conflicting outcomes.

DIFFERENCES IN MANUAL THERAPY THAT MAY EXPLAIN STUDY FINDINGS

Whether or not the study used manual therapy or manipulation only

Four of the 13 studies reported better results in the manual therapy group than the other group(s).[1–4] Five of the remaining nine studies used manipulation only, and all but one[5] reported no significant difference or a poorer response than the other group(s).[7 8 10 11]

Use of a variety of manual therapy techniques, rather than joint manipulation alone, appears to yield better results. For example, Jull *et al*[3] studied the effectiveness of manual therapy delivered by physical therapists, specific exercise therapy delivered by physical therapists, combined manual and specific exercise therapy, and a control group, for treatment of cervicogenic headache. At the 12 month follow up, both manual therapy and specific exercise groups had significantly reduced headache frequency and intensity, neck pain, and disability. In this study,[3] manual therapy included both low velocity cervical joint mobilisation techniques and high velocity manipulation techniques. These results are relevant to physical therapists with postgraduate certification in manual therapy, as they are well trained in both of these techniques. Similarly, Hoving *et al*[2]

Table 1 Search strategy

Database	MeSH headings	Limits
Medline	Manipulation, orthopaedic Manipulation, chiropractic Manipulation, osteopathic Physical therapy techniques Musculoskeletal manipulations Comparative study (Back or neck) and pain	Human English 1998–2003
Cinahl	Manual therapy Chiropractic Chiropractic manipulation Manipulation, orthopaedic Osteopathy (Back or neck) and pain	English Clinical trial 1998–2003
Embase	Manipulative medicine (Back or neck) and pain	Human English 1998–2003

Table 2 Studies reviewed

Reference	Population characteristics (n)	MT limited to manipulation only	MT delivered by:	Clinically relevant, guideline based MT	Interventions, groups	Control group	Dose (MT or manipulation)	Results	Effect size for positive studies
Aure *et al*[1]	20–60 years; chronic LBP>8 weeks, less than 6 months (49)	No	Physical therapists	Yes	1. MT plus ET. 2. ET alone	No	45 min (15 min MT); 2 sessions/week, 8 weeks	Significantly larger improvements in MT group (maintained at 1 year follow up)	0.78
Hoving *et al*[2]	18–70 years; pain or stiffness in the neck for at least 2 weeks (183)	No	Physical therapists	Yes	1. MT plus specific exercise training. 2. Active exercise focused physical therapy. 3. Continued care by GP	No	45 min; 1 session/ week for up to 6 weeks	Physical therapy including MT more effective than physical therapy without MT or continued care by a GP	Not given
Jull *et al*[3]	18–60 years; cervicogenic headache at least 1×/week for 2 months–10 years (200)	No	Physical therapists	Yes	1. MT. 2. ET (low load endurance training). 3. Combined MT and ET. 4. Control	Yes	30 min, 8–12 sessions, 6 weeks	MT as effective as ET and both significantly better than control	0.80
Moseley[4]	Chronic LBP>2 months (57)	No	Physical therapists	Yes with respect to clinical relevance (individualised and variety of techniques allowed but no references cited for MT techniques)	1. MT, specific exercise training, and neurophysiology education. 2. Medical management by GP	No	2×/week, 4 weeks	Combined physiotherapy treatment including MT, specific exercise training, and neurophysiology education resulted in improved function and pain at 1 and 12 months.	Not given
Giles & Muller[5]	17 years or older; mechanical back or neck pain for a minimum of 13 weeks (115)	Yes	Chiropractors	Yes for LBP. No for neck pain	1. Spinal manipulation. 2. Sports physician follow up (limited) and medication. 3. Acupuncture (needle).	No	20 min, 2×/week, maximum 9 weeks	Greater short term benefit for with manipulation, but not for neck pain. Acupuncture more effective for neck pain.	Not given
Andersson *et al*[6]	20–59 years; LBP lasting at least 3 weeks but less than 6 months (178)	No	Osteopaths	Yes	1. Osteopathic treatment 2. ''Standard care'' by physicians	No	1×/week for 4 weeks then 1×/2 weeks for 8 weeks	No significant difference between groups. Both groups improved	
Bronfort G *et al.*[7]	20–65 years; mechanical neck pain for at least 12 weeks (191)	Yes (but this group also received 45 min of sham microcurrent therapy)	Chiropractors	No. A reference for the use of spinal manipulation for LBP is cited, but only cervical and thoracic spine techniques were used.	1. Spinal manipulation plus upper body and neck strengthening exercise. 2. Aerobic exercise plus MedX cervical extension and rotation machine. 3. Spinal manipulation	No	20 × 1 hour sessions over 11 weeks	No significant difference between groups with respect to pain, neck disability, medication use	
Cherkin *et al*[8]	20–64 years; LBP minimum 7 days after seeing physician (321)	Yes	Chiropractors	No, side lying only	1. Chiropractic manipulation. 2. Education booklet. 3. McKenzie exercises	No	Up to 9× over 1 month	No significant difference between groups	
Curtis *et al*[9]	21–65 years; acute LBP of less than 2 months (295)	No (manipulation plus muscle energy techniques)	Physicians with limited training (18 h) in manual therapy	No	1. Manipulation and muscle energy techniques plus enhanced care 2. Enhanced care alone	No	Initial plus 4 follow ups; 2×/wk for 2 weeks	Only 43% of patients in the MT group actually received the planned treatment; no significant difference between groups	

Table 2 Continued

Reference	Population characteristics (n)	MT limited to manipulation only	MT delivered by:	Clinically relevant, guideline based MT	Interventions, groups	Control group	Dose (MT or manipulation)	Results	Effect size for positive studies
Hsieh *et al*[10]	18 years or older; LBP>3 weeks and less than 6 months (200)	Yes	Chiropractors	No, limited techniques	1. Back school. 2. Myofascial therapy. 3. Joint manipulation. 4. Combined joint manipulation & myofascial therapy	No	3× week for 3 weeks	All groups improved; no significant between-group differences at 3 or 6 months	
Hurwitz *et al*[11]	18 years or older; LBP (681)	Yes	Chiropractors	Yes	1. Medical care only. 2. Chiropractic care only. 3. Medical care with limited physical therapy. 4. Chiropractic care with modalities.	No	Treatment dose not prescribed	Chiropractic no better than other groups; physical therapy plus medical care group had less pain at 6 weeks and 6 months than medical care only	
Jordan *et al*[12]	20–60 years; chronic neck pain at least 3 months (167)	No	Mobilisation by physical therapists; manipulation by chiropractors	Yes with respect to clinical relevance (individualised) but no references cited for mobilisation or manipulation techniques.	1. Manipulation. 2. Physiotherapy without manipulation. 3. Strength training (with a focus on neck muscle training).	No	Physiotherapy: 30 min, 2×/week, 6 weeks. Chiropractic: 15–20 min, 2×/week, 6 weeks	No significant difference between groups.	
David *et al*[13]	18–75 years; neck pain> 6 weeks duration (70)	No	Physical therapists	Not clear	1. Physiotherapy. 2. Acupuncture.	No	1×/week, 6 weeks (maximum)	No significant difference between acupuncture and physiotherapy groups. Both groups improved.	

MT, Manual therapy; ET, exercise therapy; LBP, low back pain.

compared physical therapy including manual therapy with physical therapy without manual therapy for patients with chronic neck pain. Of note, they allowed the use of low velocity joint mobilisations but no high velocity low amplitude thrust techniques (synonymous with ''manipulation'').

Was the choice of intervention based on clinically relevant treatment guidelines (''best practice'') of the discipline?

Assessment and treatment protocols used in randomised controlled trials (RCTs) are not always similar to clinical practice guidelines, which are typically textbooks or guidelines written by experts in the field/discipline and based on current available evidence. Treatment protocols that do not mirror clinical practice have been examined in some studies. For example, Andersson *et al*[6] compared osteopathic treatment (including manual therapy) with ''standard care'' by doctors. However, the reported standard care included medication, active physical therapy, ultrasonography, diathermy, hot or cold packs (or both), use of a corset, or transcutaneous electrical nerve stimulation (TENS). Clearly health maintenance organisation doctors do not have the time (45 minutes), equipment, or skills—that is, active physical therapy—to provide this treatment. Further, two of the groups studying manipulation by chiropractors included participants with back or neck pain, yet they only cited references for low back pain management.[5 7] Three studies used very restricted manual assessment and/or treatment techniques[8–10] which do not reflect best practice. Three of the five studies with positive results used manual treatment (by physical therapists) based on published guidelines or clinical texts written by experts in the field.[1–3]

The dose of manual therapy or manipulation (minutes, sessions, weeks)

The optimal dose is also a consideration. Time per session, number of sessions, and number of weeks are all important factors for therapists, patients, and payors.

Knowing the optimal treatment duration has obvious implications on cost effectiveness, but probably also has an impact on the effectiveness of manual therapy. Despite the importance of these variables, there is great variability between the protocols used in these 13 studies. One study compared chiropractic care only, medical care only, medical care with limited physical therapy, and chiropractic care with modalities but did not prescribe a treatment dose.[11]

However, they did monitor use of the various treatment modes and time per session and found that one third of patients randomly assigned to medical care with physical therapy had no physical therapy visits, and 20% of patients in the chiropractic groups received concurrent medical care, whereas only 7% of patients in the medical care groups received concurrent chiropractic care. They also report that chiropractors and medical providers in their study spent an average of 15 minutes with patients at each visit, and physical therapists averaged 31 minutes per patient visit.

Only six studies reported the time per session. Time varied from 20 to 60 minutes per treatment. Of interest, three of the five studies with positive results allowed between 30 and 45 minutes per treatment. One (of the studies with positive results) did not report treatment time,[4] and the other had mixed results (positive for back pain but not for neck pain) and allowed 20 minutes per treatment.[5]

The total number of sessions varied from 5 to 20, with a frequency of between once a week and three times a week. Some studies did not prescribe a maximum or minimum number of sessions a week (table 2).

The number of weeks of treatment varied from 3 to 12. Of note, the five studies with positive results used between four and nine weeks of treatment.[1–5]

Combination therapies

A number of studies have investigated a combination of therapies such as two healthcare professionals or a combination of manual therapy or manipulation with another mode of treatment.

Of note, four of the five studies with positive results used manual therapy in combination with another aspect of physical therapy (exercise therapy,[1 2] specific exercise training,[3 4] and neurophysiology education[4]). Similar positive results were not seen in chiropractic studies of spinal manipulation combined with exercise[7 10] or modalities.[11]

METHODOLOGICAL FACTORS

This critical appraisal also examined two key methodological factors that can influence randomised RCT findings. Firstly, the presence or absence of a control group is an important factor, yet only one[3] study had a control (table 2). Secondly, an important issue when examining discordant outcomes of RCTs is power,[18] as underpowered studies can lead to type II error. Fewer than one third of the studies reviewed reported prospective power calculations,[1 3 8 9] and one study reported what appears to be retrospective power.[10] Retrospective power has limitations as described in detail elsewhere,[19] thus all RCTs should calculate power a priori.

SUMMARY AND CONCLUSIONS

In summary, I return to the question that was the genesis of this leader, what explains the apparently inconsistent data in the field of manual therapy outcomes? Critical appraisal suggests that more precise interventions are successful in treating low back pain, chronic neck pain, and cervicogenic headache. There are clinically relevant differences between studies reporting positive results of manual therapy and those reporting no significant difference over other conservative treatments. Specifically, the treatment protocol needs to reflect what therapists are actually doing in clinical practice—that is, using more than one manual therapy technique or combining manual therapy with other modes of treatment such as specific exercise training. Interventions based on best practice guidelines/texts appear to be more successful, and physical therapy including manual therapy at a dose of 30–45 minutes per session, for four to eight weeks has been shown to be effective.[1–4]

Further research is needed to identify populations who are most likely to improve with manual therapy. For example, Flynn *et al*[20] identified five variables to form a clinical prediction rule for patients with low back pain who are likely to respond favourably to a specific manipulative technique. In that study decisions on the side to be manipulated were not based on clinical best practice guidelines and only one manipulation technique was used (thus not representative of clinical practice), yet this approach to refine clinically relevant procedures may prove very useful.

Finally, manual therapy is not only used in the treatment of low back and neck pain. Further investigations of the effectiveness of manual therapy in special populations are needed. Pilot studies have been conducted in patients with thoracic pain,[21] cervicobrachial pain syndrome,[22] and we have conducted studies on the safety of manual therapy in the osteoporotic spine.[23] The next step is for researchers to conduct well designed RCTs to determine the effectiveness of manual therapy for pain and disability in these populations.

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Correspondence to: M M Sran, Division of Orthopaedic Engineering Research, Department of Orthopaedics, Faculty of Medicine, University of British Columbia, VGH Research Pavilion, Room 500, 828 W 10th Ave, Vancouver, BC V5Z 1L8 Canada; mmsran@interchange.ubc.ca

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ELECTRONIC PAGES

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Aseptic bone necrosis in an amateur scuba diver

G D M Laden, P Grout

A case is reported that provides further evidence of an old occupational hazard, dysbaric osteonecrosis, presenting in a new population (sports scuba divers) who also appear to be at risk. It highlights the need for an accurate diagnosis of diving related illness.

(*Br J Sports Med* 2004;**38**:e19) http://bjsm.bmjjournals.com/cgi/content/full/38/5/e19

Abdominal coarctation in a hypertensive female collegiate basketball player

B Sloan, S Simons, A Stromwall

The purpose of the preparticipation examination is to identify health conditions that might adversely affect an athlete while participating in sport. Hypertension is the most common. This case report details a female basketball player found to be hypertensive, and complaining of fatigue, at her pre-participation physical examination. Presentation, diagnostics, treatment, and final outcome of coarctation involving the abdominal aorta are summarised.

(*Br J Sports Med* 2004;**38**:e20) http://bjsm.bmjjournals.com/cgi/content/full/38/5/e20

Clinical and magnetic resonance imaging features of cricket bowler's side strain

D Humphries, M Jamison

The clinical features of 10 cases of lateral trunk muscle injury in first class cricket pace bowlers are described. Typically the injury occurs during a single delivery, is associated with considerable pain, and prevents the bowler from continuing.

The clinical picture is typical of a muscular or musculo-tendinous injury. The most consistent clinical tests were focal tenderness on palpation and pain with resisted side flexion towards the painful side. The magnetic resonance image in.

70% of cases was consistent with an injury to the internal oblique, the external oblique, or the transversalis muscles at or near their attachments to one or more of the lowest four ribs. The injury occurs on the non-bowling arm side. Recovery can be prolonged. The injury was a recurrence in six of the 10 cases. The biomechanics of the injury are not yet understood.

(*Br J Sports Med* 2004;**38**:e21) http://bjsm.bmjjournals.com/cgi/content/full/38/5/e21