

Thoracic spine thrust manipulation versus cervical spine thrust manipulation in patients with acute neck pain: a randomized clinical trial.

Puenteadura EJ, Landers MR, Cleland JA, Mintken PE, Huijbregts P and Fernández-de-Las-Peñas C (2011) Thoracic spine thrust manipulation versus cervical spine thrust manipulation in patients with acute neck pain: a randomized clinical trial. *Journal of Orthopaedic and Sports Physical Therapy* 41: 208-220. (Abstract prepared by Emily Solsberg)

Objective

To determine if patients with neck pain who met the Clinical Prediction Rule (CPR) for thoracic spine thrust joint manipulation (TJM) would have a different outcome if they received cervical spine TJM instead.

Methods

Twenty-four consecutive patients, aged 26-48 years, presenting to physiotherapy treatment with neck pain who met four of the six CPR criteria for thoracic TJM (Cleland et al, 2007). Participants were randomly assigned to one of two groups: (i) the thoracic group (n=10), which received two sessions of thoracic TJM plus cervical range of movement exercises, followed by three standardised exercise sessions; or (ii) the cervical group (n=14), which received two sessions of cervical TJM with the same range of movement exercises and standardised exercise sessions as the thoracic TJM group (five treatment sessions in total for both groups). Follow-up assessments were conducted at one week, four weeks and six months. Outcome measures included the Neck Disability Index (NDI), Fear-Avoidance Beliefs Questionnaire, Physical Activity Subscale (FABQ-PA), numeric pain rating scale (NPRS) and Global Rating of Change (GRoC).

Results

The cervical TJM group showed a significantly greater improvement in NDI ($p < 0.001$), FABQ-PA ($p < 0.004$) and NPRS ($p < 0.003$) at all follow up periods. Four of the 14 participants in the CJM group withdrew from the study due to reporting "100% improvement" of their condition after the second treatment session. The number needed to treat to prevent an unsuccessful overall outcome was 1.8 at one week and 1.6 at four weeks and six months. No serious adverse events were reported for either group at any time although some participants reported transient side effects such as headache and temporary increase in neck pain.

Conclusions

Patients treated with a combination of cervical TJM and exercise had significantly greater improvement in pain and disability compared to thoracic TJM plus exercise.

Commentary

A CPR was developed by Cleland et al (2007) to predict those patients with neck pain who would respond favourably to thoracic TJM. This study and the techniques used were based on the proposed biomechanical links between the thoracic and cervical spines (Cleland et al 2007) and the hypoalgesic effects of TJM on neck pain (Vicenzino et al 1998). Another key reason for the development of this CPR was the ongoing controversial topic of safety and risk of cranio-cervical arterial dysfunction from cervical spine manipulation (Ernst 2007). The authors felt that because of an observed favourable response in neck pain to TJM, this technique may be a safer alternative or adjunct to cervical manipulation without adverse side effects such as vertebral artery injury (Cleland et al 2007). Since publication, the validity of this CPR has been called into question, by some of the original authors no less, by a larger, multi-centre randomised controlled trial (Cleland et al 2010), which suggests that the original outcomes were not quite as convincing as previously reported.

The current study shows good outcomes for cervical TJM, with significantly greater improvements in all outcome measures than the thoracic TJM group. However, these results should be interpreted with caution, as the sample size was relatively small due in part to the strict inclusion and exclusion criteria (four out of six of the following: symptom duration less than 30 days, baseline NDI $\geq 10/50$, no symptoms distal to the shoulder, FABQ < 12, decreased thoracic kyphosis T3-5, decreased cervical spine extension $< 30^\circ$). Indeed, of the 96 patients screened for the study, only 24 met the criteria. This is not necessarily a negative criticism of the study as it highlights the need, when selecting cervical spinal manipulation as a treatment technique, to carefully consider the characteristics of the patient receiving the treatment and demonstrates the success with treatment when this selection is carried out. However, this patient population presented with acute symptoms (mean duration, 14.7 days) and the strength of the study may have been improved by including a control group to allow for the natural resolution of the condition. Another consideration is the seemingly arbitrary selection of the level of manipulation in the thoracic TJM group; each subject received one thrust at both the mid- and lower thoracic spine. It was not specified why these areas were chosen. In the cervical TJM group, manipulation was directed at a specific hypomobile spinal level as determined through assessment by the clinician. Perhaps a thrust directed at a restricted thoracic level in the TJM group may have changed the outcomes of the study.

In becoming mired in the complexities of risk surrounding cervical spine manipulation, and the consequent distancing from this technique by many in the physiotherapy profession, it is perhaps unsurprising that a treatment technique directed *towards* the affected area (the neck) would have greater effect than one directed distally (the thoracic spine). This study highlights the need for effective *and* safe practice, and provides encouraging evidence both for training and experienced manual therapists to improve and maintain their skills in cervical spine manipulation. If these selection criteria were to be applied to patients in the physiotherapy clinic, it would not eliminate cervical spine manipulation from use but would certainly focus the population it was practised on. This in turn may help to prevent unnecessary adverse consequences of TJM of the cervical spine by targeting patients for whom these techniques are most appropriate.

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