The temporal effects of a single session of high-velocity, low-amplitude thrust manipulation on subjects with spinal pain
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CRD summary
The review concluded that the temporal pain-relieving benefits following high velocity, low amplitude thrust manipulation in patients with spinal pain were immediate and short-term in nature and demonstrate little to no carry-over when applied alone. However, the review had several methodological limitations which suggest that these conclusions should be interpreted with caution.

Authors’ objectives
To assess the temporal neurophysiological effects of a single session of high velocity, low amplitude thrust manipulation in patients with spinal pain.

Searching
MEDLINE, CINAHL and PEDro were searched for studies in English; search terms (but not dates) were reported. Reference lists of relevant papers were examined for further studies.

Study selection
Eligible randomised controlled trials (RCTs) used single-session high velocity, low amplitude thrust manipulation for patients with current neck or back pain (who reported pain in the spinal region). Studies that used concurrent interventions were excluded. The primary outcome was pain response (or a pain-related measure). Studies had to follow-up participants beyond the immediate post-intervention assessment.

Neck and back pain patients were recruited in the included studies. Control treatments included sham manipulation, detuned diathermy and supine knee-to-chest mobilisation. Two studies reported pain with visual analogue scales.

One reviewer screened articles for initial relevance, with relevant articles then being screened independently by two other reviewers. Disagreements were resolved by consensus.

Assessment of study quality
Study quality was evaluated with the Newcastle-Ottawa scale for observational studies which assesses eight criteria, resulting in a score out of nine. The scale covered aspects of group selection, group comparability and ascertainment of exposure or outcomes.

Two reviewers assessed study quality with disagreements resolved by consensus, or by a third reviewer.

Data extraction
The authors did not state how many reviewers extracted data.

Methods of synthesis
A narrative synthesis was presented.

Results of the review
Five RCTs were included (276 participants, range 18 to 104). On the Newcastle-Ottawa scale one trial scored 5, one scored 7, one scored 8 and two scored 9. Follow-up periods ranged from 30 minutes to seven days.

Two trials found no significant differences compared with baseline following treatment with high velocity, low amplitude thrust manipulation for blood pressure, pulse rate and plasma constituents. Three trials reported significant immediate reductions in self-reported pain. All effects were short-lived with a return to baseline levels, or a reduced effect, being seen at later follow-up points.
**Authors' conclusions**
The temporal pain-relieving benefits following high velocity, low amplitude thrust manipulation in patients with spinal pain were immediate and short-term in nature and demonstrate little to no carry-over when applied alone.

**CRD commentary**
The review addressed a clear question and was supported by appropriate inclusion criteria. Three databases were searched but only for studies in English; search dates were not reported and no search was made specifically to identify unpublished studies so it was possible some relevant studies may have been missed. Only one reviewer screened articles for initial relevance so the possibility of errors or bias affecting this phase of the review were not minimised. Processes to reduce error and bias were used for the assessment of study quality.

Narrative synthesis appeared appropriate considering the clinical heterogeneity between studies. The appropriateness of an observational study quality assessment tool to evaluate RCTs was questionable, particularly since several studies reported between-treatment group comparisons (no numbers were given for primary study results, making it difficult to evaluate the clinical relevance of the evidence). This review had several methodological limitations, which suggests that its conclusions should be interpreted with caution.

**Implications of the review for practice and research**

- **Practice**: The authors stated no implications for practice.
- **Research**: The authors stated that future research should address whether observed neurophysiological phenomena were maintained over time and whether they were associated with positive clinical outcomes. They added that research was needed to outline the impact of different iterations of concurrent exercise programmes following high velocity, low amplitude thrust manipulation.

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