
Manual therapy and exercise for neck pain: a systematic review

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CRD summary

This well-conducted review concluded that the benefits of combined mobilisation or manipulation plus exercise were reinforced; clinically important changes were noted in subacute/chronic neck pain with or without cervicogenic headache. Manipulation or mobilisation plus exercise provided some added short-term pain relief. However, the poor quality of the included evidence reduces the reliability of the authors' conclusions.

Authors' objectives

To assess the effectiveness of manual therapy and exercise for neck pain with or without radicular symptoms or cervicogenic headache on pain, function/disability, quality of life, global perceived effect and patient satisfaction.

Searching

Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE, MANTIS, CINAHL and ICL were searched without language restrictions to July 2009. Search terms were reported. Reference lists were searched, content experts contacted and personal files checked for additional studies.

Study selection

Randomised controlled trials (RCT) or quasi-RCT of adults with neck pain with or without radiculopathy or cervicogenic headache were eligible for inclusion. Eligible interventions compared manual therapy (including manipulation or mobilisation techniques, combined with exercise) with either placebo, a waiting list/no treatment control, adjunct treatment (such as mobilisation and exercise plus ultrasound versus ultrasound) or some other treatment. Outcomes included pain, function/disability, quality of life, global perceived effect and patient satisfaction for short-term (closest to four weeks) to long-term (closest to 12 months) follow-up.

Included studies assessed neck pain (acute, subacute, chronic and mixed duration), whiplash associated disorders (WAD I and II), degenerative changes, cervicogenic headache (acute, subacute, chronic and mixed duration) and neck disorders with some radicular signs and symptoms including WAD III (chronic and mixed). There was a wide range of intervention comparisons, treatment characteristics and dosages. Treatment duration varied from three to 12 weeks. The number of sessions, where reported, was up to 25.

Two reviewers selected studies for inclusion in the review; disagreements were resolved through consultation with a third reviewer.

Assessment of study quality

Study quality was assessed using: Jadad score (maximum score 5, high score >2); van Tulder score (maximum score 11, high score >5); and the adapted Cochrane Risk of Bias method (maximum score 12, high score >5).

Two reviewers performed the quality assessment.

Data extraction

Two reviewers calculated standardised mean differences (SMDs) and relative risk (RR), together with 95% confidence intervals (CI). The assumption made for imputation of missing values was that data were missing completely at random. The reported p value boundary was used to estimate the standard deviation for the pain intensity outcome and the variance in both the control and experimental group were assumed to be the same. Standardised mean differences were estimated using reported median and estimated standard deviation values. Disagreements were resolved through consultation with a third reviewer.

Methods of synthesis

The studies were combined in a meta-analysis. Pooled effect sizes, with 95% CIs, were calculated using a random-effects model. Statistical heterogeneity was assessed with I^2 . Number needed to treat (NNT) was calculated.

Results of the review

Seventeen RCTs (n=2,088) were included in the review. Five trials were considered to be at low risk of bias and 12 trials considered to be at high risk. Shortcomings of the studies included a failure to describe or use appropriate allocation concealment (nine studies) and a lack of effective blinding procedures including the observer (10 studies), patient (17 studies) or care provider (17 studies). Only a few trials avoided cointervention (four studies). Acceptable compliance was found in four studies. Follow-up ranged from zero to 56 weeks.

Manual therapy and exercise provided long-term improvement in pain compared to no treatment (SMD -0.87, 95% CI -1.69 to -0.06; $I^2=54\%$; three studies) and traditional care at short-term follow-up (SMD -0.97, 95% CI -1.32 to -0.63; $I^2=0\%$; two studies); there was no significant improvement compared with exercise with or without modalities (three studies) or other treatments (three studies).

Manipulation, mobilisation and exercise were favoured over exercise alone in the short-term (SMD -0.50, 95% CI -0.76 to -0.24; $I^2=27\%$; three studies), but not in the long-term (three studies). Combining exercise with mobilisation and manipulations for intermediate to long-term pain relief were preferable to manipulation or mobilisation (SMD -0.48, 95% CI -0.78 to -0.18; $I^2=0\%$; two studies). Manipulation and/or mobilisation provided long-term improvement in pain compared to advice (SMD -0.94, 95% CI -1.30 to -0.57; $I^2=46\%$; three studies).

Manual therapy and exercise provided improvement in function compared to no treatment (SMD -0.57, 95% CI -0.94 to -0.21; $I^2=0\%$; two studies), manipulation or mobilisation (SMD -0.31, 95% CI -0.61 to -0.02; $I^2=0\%$; two studies) and advice (SMD -0.55, 95% CI -0.81 to -0.29; $I^2=0\%$; two studies); there was no significant improvement compared with traditional care (two studies) or exercise with or without modalities (three studies).

For quality of life there was no significant improvement compared with exercise with or without modalities (two studies), manipulation or mobilisation (two studies) and general practitioner care (one study).

Cost information

Moderate evidence favoured reduced costs for care consisting of manual therapy and exercise for acute, subacute and chronic mechanical neck disorder with or without headache or radicular findings (no data provided).

Authors' conclusions

The benefits of combined mobilisation or manipulation plus exercise were reinforced with additional trials, across multiple outcomes and in the long term. A clinically important change across multiple outcomes was noted in subacute/chronic neck pain with or without cervicogenic headache. Manipulation or mobilisation added to exercises alone provided some added short-term pain relief.

CRD commentary

The review addressed a clear question supported by well-defined inclusion criteria. Several databases were searched with no language restrictions for relevant studies, which reduced the chances of language bias. Appropriate methods were used to reduce potential for reviewer bias and error in all parts of the review.

Trial quality was assessed using appropriate criteria; the included trials were generally of poor quality. Standard statistical methods were used to pool data. Potential sources of heterogeneity were explored.

This was a well-conducted review. The authors' conclusions reflected the evidence presented. However, the poor quality and small number of included trials per comparison reduced the reliability of the conclusions.

Implications of the review for practice and research

Practice: The authors stated that manipulation or mobilisation and exercise produced a greater long-term improvement in pain and global perceived effect compared to no treatment for chronic neck pain, subacute/chronic neck pain with cervicogenic headache and chronic neck pain with or without radicular findings. Compared to exercise alone, manual therapy and exercise produced greater short-term pain relief and no long-term difference across multiple outcomes for neck pain of chronic and mixed duration with or without cervicogenic headache. Compared to manipulation or mobilisation alone for chronic neck pain, manual therapy and exercise combined produced greater improvements in pain, function, quality of life and patient satisfaction. Manipulations, mobilisations and exercise were favoured over

traditional care for reducing pain at short-term follow-up for acute WAD, but may be no different at long-term follow-up for neck pain of chronic or mixed duration.

Research: The authors stated that phase II trials with improved methodological quality and factorial design would help identify the most effective treatment characteristics and dosages for both exercise and manual therapy

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Other publications of related interest

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