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Research Paper Review

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Review Title: Cervical Manipulation for Degenerative Cervical Radiculopathy – Systematic Review & Meta-Analysis

Research Review By Dr. Ceara Higgins©

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Study Title:

Does cervical spine manipulation reduce pain in people with degenerative cervical radiculopathy? A systematic review of the evidence, and a meta-analysis

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Background Information:

Degenerative cervical radiculopathy results from cervical nerve root compression, often due to osteophytosis or cervical intervertebral disc herniation. Patients typically experience neck pain with radiating arm pain. This condition is often treated through conservative therapies including oral analgesics, oral steroids, cervical computer traction, manual therapy, exercise, cervical collars, or various combinations of these (1). Many patients with cervical radiculopathy now turn to other conservative treatments, such as cervical spine manipulation, to relieve their symptoms while reducing the potential side effects of medications (2). There has been relatively little evidence showing the effectiveness and safety of cervical manipulation for specific neck pain (i.e. something other than 'mechanical'), but the existing reviews do not include results for cervical radiculopathy in a manner that distinguishes it from other types of neck pain (3). Therefore, the purpose of this review was to evaluate the effectiveness and safety of cervical spinal manipulation in the treatment of cervical radiculopathy.

Pertinent Results:
Three randomized controlled trials were included in the review. These studies included a total of 502 patients with degenerative cervical radiculopathy, with an average age ranging from 45 to 53.6 years. All three studies included a manipulation group and a control group (all providing cervical traction), and used the Visual Analogue Scale (VAS) as an outcome measure. Two different diagnostic criteria for cervical radiculopathy were used, but were nearly identical in symptomatology and imaging criteria.

While all three studies used cervical computerized traction (20 or 30 minutes in duration) as their control, each used a different cervical manipulation. These included cervical rotation manipulation, cervical rotation-traction manipulation, and cervical fix-point traction manipulation (not further defined). Treatment frequency was also not consistent, with one study treating two times per week and the other two treating every second day. Treatment periods were 2 or four weeks (not terribly long considering the often chronic nature of neck pain with radiculopathy!).

Efficacy of Cervical Manipulation vs. Computerized Traction:
The authors were able to conduct a meta-analysis, demonstrating the superiority of cervical manipulation compared to mechanical traction for improving pain measured with the VAS immediately after treatment. The evidence was judged to be of moderate quality. *EDITOR'S NOTE: It is not surprising that manipulation would demonstrate a better immediate pain reduction outcome, as this is what we commonly see in practice. In addition, mechanical, computerized traction may be less likely to provide immediate pain relief – so based on the length of treatment protocols in the included studies (2 or 4 weeks), we must interpret these results cautiously.*

Clinical Application & Conclusions:
Based upon this review, it can be suggested that cervical manipulation outperforms mechanical traction in terms of immediate pain reduction in patients with degenerative cervical radiculopathy. However, more research is needed to compare manipulation with alternative treatments other than cervical computerized traction and to determine the general safety of cervical manipulation in this population.

EDITOR'S NOTE: The management of degenerative spinal conditions with high-velocity, low-amplitude spinal manipulation remains controversial and unfortunately, the evidence cannot provide a clear answer for us at this point. To adjust, or not to adjust? In the real world, the decision to incorporate SMT into a treatment plan for these (all?) patients must rest in the judicious combination of a careful history, physical examination, and discussion with the patient. It should also involve careful monitoring of progress, with a distinct shift in treatment approach should the patient's condition be worsening!

Study Methods:
Studies were included if they met the following criteria:

- Randomized controlled trials comparing cervical manipulation to no treatment or conventional therapies in patients with cervical radiculopathy
- Use of the visual analogue scale (VAS), McGill pain questionnaire, or analogous pain scales as outcome measures
- Published in English or Chinese

The authors searched PubMed, The Cochrane Central Registry or Controlled Trails , EMBASE, Chinese Biomedical Literature Database, Chinese National Knowledge

Infrastructure, Chinese Scientific Journal Database, and Wanfang data up to December 2014. Search terms included: “radiculopathy”, “cervical radiculopathy”, “cervicobrachial pain”, “cervical spondylotic radiculopathy”, “cervical disc herniation”, “conservative treatment”, “conservative therapy”, ”manual therapy”, “cervical spine manipulation”, “manipulati*”, “random”, and “review”.

Two authors independently extracted data, which included:

- Author’s names
- Year of publication
- Sample size
- Mean age
- Symptom duration
- Diagnosis criteria
- Type of manipulation
- Treatment process
- Details of the intervention and control
- Duration of the treatment and follow up
- Outcome measures
- Adverse effects

Any disagreement was resolved by discussion and consensus was reached through a third author.

Articles were assessed for quality using the PEDro (Physiotherapy Evidence Database) scale and considered acceptable if a score of 5 out of a possible score of 10 was achieved. The GRADE (Grades of Recommendation, Assessment, Development, and Evaluation) approach was also utilized to assess the overall quality of the evidence (4). This approach considers five basic factors that could decrease the quality of the evidence:

1. Limitations in study design and/or execution
2. Inconsistency of results
3. Indirectness of evidence
4. Imprecision of results
5. Publication bias

Every time one of these factors was not met, the quality of the evidence was downgraded by one level. This allowed the authors to group the evidence into quality levels as follows:

- High quality: Further research is very unlikely to change our confidence in the estimate of effect.
- Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
- Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
- Very low quality: Any estimate of effect is very uncertain.

Study Strengths / Weaknesses:

Strengths:

- All included studies received PEDro scores or 5 or 6 points out of 11, reducing the risk of bias.
- Only randomized controlled trials were included in this review.

Weaknesses:

- Achieving true blinding in patients and clinicians in a study centered around manipulation is difficult if not impossible – something that obviously affects this body of evidence.
- Due to the limited number of trials, analysis of sensitivity, subgroup and publication bias could not be performed.
- The treatment duration of the trials was generally short, only lasting two to four weeks, with only one trial including a one-month follow-up.
- Cervical manipulation was only compared to cervical traction. It would be helpful to have a more diverse array of comparison treatments.
- No information on adverse events was included, so no conclusions could be drawn about the safety of cervical manipulation for degenerative cervical radiculopathy.
- Due to possible limitations in the search terms and languages searched, it is possible that relevant trials were missed.

Additional References:

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4. Guyatt GH, Oxman AD, Vist GE, et al. GRADE: An emerging consensus on rating quality of evidence and strength of recommendations. BMJ 2008; 336: 924-926.