Manual examination of the spine: A systematic, critical literature review of reproducibility*

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Background

Manual palpation is a widely used procedure for the diagnosis of biomechanical dysfunctions among providers of manual medicine. Contrary to the expectations of many clinicians, unacceptable levels of reproducibility have been shown in the majority of the previously published literature, and authors of newer reviews have questioned the utility of manual examination procedures in spinal diagnosis.

Purpose

- To systematically review and critically assess the design and statistical methodology of the literature pertaining to the reproducibility of spinal palpation.
- To conduct a meta-analysis to evaluate the consistency of study outcomes.
- To determine the level of evidence.

Method

- Relevant literature published 1965-2005 was identified using the electronic databases MEDLINE, MANTIS, and CINAHL, and checking of reference lists.
- Index terms: “reproducibility”, “reliability”, or “observer variation” in combination with “palpation”, “motion palpation”, “physical examination procedures”, or “spine” in text and abstracts.
- Six categories of palpation were defined: Motion Palpation, Static Palpation, Osseous Pain, Soft Tissue Pain, Soft Tissue Changes, Global Assessment.
- Descriptive data from included papers were extracted independently by two reviewers.

Main findings

48 studies were included in the review. 63% were high quality.

The Metaanalysis showed a tendency to increased reproducibility in studies of:
- Higher levels of standardization (Intra: 0.44–0.55).
- Parallel testing (Intra: 0.23–0.61).
- Regional testing (versus segmental level).

The sensitivity analysis showed:
- A 25 % change in the definition of “high” quality is possible without changing the conclusions.
- Clinically acceptable level of reproducibility is very sensitive to changes (K ≥ 0.4).

Conclusions

- Palpation for pain is reproducible at a clinically acceptable level, both within the same observer and among observers.
- Palpation for Global Assessment is reproducible within the same observer.
- The reproducibility of Motion Palpation, Soft Tissue Changes and Static palpation is not clinically acceptable.
- No evidence or conflicting evidence exists for Static Palpation and intra-observer reproducibility of Soft Tissue Changes.
- The results of this review are overall robust with respect to the predefined levels of acceptable quality. However, the results are sensitive to changes in the preset level of clinically acceptable reproducibility and to the number of included studies.

Analysis

The sequence of analysis and pre-specified cut-points:

1. Methodological Quality - 6 point scale:
   - Low quality < 50 %
   - High quality ≥ 50 %

2. Meta-analysis - tested the consistency of study results. Included were:
   - High quality studies with a description of the palpation procedure.
   - Studies using a binary classification of the test outcome.

3. Evidence analysis
   Taking into account:
   - The number, quality, and consistency of results.
   Defined levels of evidence:
   - Strong, moderate, preliminary, conflicting, no evidence.
   Clinically acceptable reproducibility: K ≥ 0.4

4. Sensitivity analysis
   Tested the robustness of the assumptions

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