**Article Full Title**

Risks associated with spinal manipulation

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**Paper Abstract**

The aim of this systematic review was to summarize the evidence about the risks of spinal manipulation. Articles were located through searching three electronic databases (MEDLINE, EMBASE, Cochrane Library), contacting experts (n =9), scanning reference lists of relevant articles, and searching departmental files. Reports in any language containing data relating to risks associated with spinal manipulation were included, irrespective of the profession of the therapist. Where available, systematic reviews were used as the basis of this article. All papers were evaluated independently by the authors. Data from prospective studies suggest that minor, transient adverse events occur in approximately half of all patients receiving spinal manipulation. The most common serious adverse events are vertebrobasilar accidents, disk herniation, and cauda equina syndrome. Estimates of the incidence of serious complications range from 1 per 2 million manipulations to 1 per 400,000. Given the popularity of spinal manipulation, its safety requires rigorous investigation. Spinal manipulation is practiced by chiropractors, osteopathic physicians, physiotherapists, physicians, and other health care providers. It is a manual form of treatment aimed mainly at reducing spinal (and other joint) pain and increasing range of motion. It often involves a high velocity thrust, a technique in which the joints are adjusted rapidly, often accompanied by popping or snapping sounds. The technique results in transient stretching of joint capsules and is believed to reset the position of the spinal cord and nerves, allowing the nervous system to function optimally and improve the body’s biomechanical efficiency (1). The thrust is exerted through either a long lever arm, in which force is applied distant from the joint, or a short lever arm, when force is applied close to the joint. Although spinal manipulation is deemed by experts to be an effective form of treating back pain (2), the evidence from randomized clinical trials remains contradictory 3, 4, 5. The use of spinal manipulation differs considerably according to time and location. One-year usage rates from 7% (1997, United States), 10% (1998, Austria), 15% (1996, Australia), 16% (1998, United States), to 33% (1996, United Kingdom) have been reported (6). Given its popularity, it seems imperative to define the risks of spinal manipulation as closely as possible.

**NIH Risk of Bias Tool**

Quality Assessment of Systematic Reviews and Meta-Analyses

**Is the review based on a focused question that is adequately formulated and described?**

Yes

**Were eligibility criteria for included and excluded studies predefined and specified?**

No

**Did the literature search strategy use a comprehensive, systematic approach?**

Yes

**Were titles, abstracts, and full-text articles dually and independently reviewed for inclusion and exclusion to minimize bias?**

No

**Was the quality of each included study rated independently by two or more reviewers using a standard method to appraise its internal validity?**

No

**Were the included studies listed along with important characteristics and results of each study?**

**Was publication bias assessed?**

Cannot Determine, Not Reported, Not Applicable

**Was heterogeneity assessed? (This question applies only to meta-analyses.)**

Cannot Determine, Not Reported, Not Applicable

**Key Finding #1**

Spinal manipulation is frequently associated with non-serious adverse events and rarely associated with serious adverse events.

**Key Finding #2**

Many studies argued that there is far less risk associated with spinal manipulation compared to other treatments for the same conditions (ex. NSAIDs).

**Key Finding #3**

The most common minor adverse event reported was local discomfort which was found to be more common than any serious adverse event which included vertebrobasilar accidents, disc herniations, cauda equina and other cerebral complications.

**Key Finding #4**

**Please provide your summary of the paper**

This paper reviewed articles found from MEDLINE, EMBASE and Cochrane Library based on the search terms "adverse effects, adverse events, chiropractic, complications, manual therapy, osteopathy, risk, safety, spinal manipulation, stroke and vascular accident". The article also consulted nine experts. After reviewing the articles, the systematic review concluded that more non serious adverse events occurred after spinal manipulation compared with serious adverse events. The evidence found was anecdotal and often incomplete so it was hard to understand if the spinal manipulation was always the cause of the adverse event, whether serious or non serious. The article also touched on the evidence that was found stating that other treatments (NSAIDs) for the same condition (low back pain) were potentially more dangerous than spinal manipulation. The article concluded that serious events following spinal manipulation were rare and continued to emphasize the important of having patient consent and informing them of the risks prior to treatment.

**Please provide your clinical interpretation of this paper. Include how this study may impact clinical practice and how the results can be implemented.**

This paper is a useful resource to help better understand some of the adverse events associated with spinal manipulation and how often they occur in clinical practice. Since this review was completed in 2002, it would be interesting to see if there was more recent evidence, either for or against spinal manipulation, that differed greatly from the information found in this article. However, this review is helpful in providing evidence that serious adverse events are rare in the implementation of spinal manipulation, which can have a direct impact on clinical practice by supporting manual therapy as a treatment option. The article still emphasized the importance of informing the patient of what spinal manipulation is and the risks associated with it before gaining their consent. This is an important aspect of implementing spinal manipulation into clinical practice and should constantly be a priority for clinicians when prescribing this treatment.