Risks associated with spinal manipulation
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Authors' objectives
To summarise the evidence about the risks of spinal manipulation.

Searching
MEDLINE (via PubMed), EMBASE, and the Cochrane Library were searched in November 2001 (start dates not given) for articles in any language. The search terms used were 'adverse effects', 'adverse events', 'chiropractic', 'complications', 'manual therapy', 'osteopathy', 'risk', 'safety', 'spinal manipulation', 'stroke', and 'vascular accident'. Reference lists and the authors' own files were handsearched, and other experts (n=9) were consulted.

Study selection
Study designs of evaluations included in the review
Any report containing data about the risks associated with spinal manipulation was included. Recent systematic reviews were used as the basis of the article.

Specific interventions included in the review
The specific intervention was spinal manipulation.

Participants included in the review
Patients of all ages who were receiving spinal manipulation were included.

Outcomes assessed in the review
The nature and incidence of adverse events was assessed.

How were decisions on the relevance of primary studies made?
The authors do not state how the papers were selected for the review, or how many of the reviewers performed the selection.

Assessment of study quality
The authors do not report the method used to assess validity, or how the validity assessment was performed.

Data extraction
The authors do not state how the data were extracted for the review, or how many of the reviewers performed the data extraction. Data on the patients, type of therapist, adverse event, outcome and causation were extracted from some of the primary reports.

Methods of synthesis
How were the studies combined?
The authors do not report a method for combining the studies.

How were differences between studies investigated?
The authors do not report a method for investigating heterogeneity between the studies.

Results of the review
Systematic reviews (1), comprehensive reviews (2), case-control studies (1), case reports and case series (27), and
retrospective surveys (7) were included.

Minor adverse events.

A systematic review of 5 prospective investigations of the risks of spinal manipulation concluded that mild-to-moderate transient adverse reactions occur in approximately half of the patients who undergo spinal manipulation (see Other Publications of Related Interest no.1). The largest of these studies involved 1,058 patients, who received a total of 4,712 treatments from 102 chiropractors in Norway. At least one adverse reaction was reported by 55% (n=580) of the patients. No serious, permanent complications of spinal manipulation were reported, but follow-up was not described. These results were confirmed by a similar study in Sweden (625 patients) and another from the United Kingdom (68 patients), which were published after the systematic review.

Serious adverse events.

Nature of the adverse events: a comprehensive literature review identified 295 cases of complications following spinal manipulation (see Other Publications of Related Interest no.2). These included 165 vertebrobasilar accidents (of which 29 were fatal), 61 cases of disk herniation or progression of radicular symptoms to cauda equina syndrome, and 13 other cerebral complications. There were 56 reports of other types of complication, including dislocations and fractures, that were often accompanied by spinal cord compression.

A more recent review examined reports of injury attributed to cervical spinal manipulation and located 177 cases (of which 32 were fatal) published between 1925 and 1997 (see Other Publications of Related Interest no.3). The most frequently reported injuries involved arterial dissection, or spasm and lesions of the brain stem.

Twenty-two case reports and case series of serious adverse events in 108 patients, which were published after 1997, showed the most common adverse events to be cerebrovascular accidents, often with permanent neurologic deficits, including one fatality. Three retrospective surveys of neurologists reported a total of 149 cases of serious adverse events, mostly related to cerebrovascular accidents.

Incidence of serious adverse events: the most reliable estimate was derived from a population-based nested case-control study from Canada. This used 582 cases of vertebrobasilar accidents, each of which was matched with 4 patients without a history of stroke. For every 100,000 persons younger than 45 years who were receiving chiropractic treatment, approximately 1.3 cases of vertebrobasilar accidents attributable to that treatment would be observed within 1 week of manipulation. There were no significant associations for patients aged over 45 years.

Authors’ conclusions
Spinal manipulation is frequently associated with non-serious adverse events and rarely with serious adverse events. Evidence about serious adverse events is essentially anecdotal, and it is difficult to establish a cause-effect relation, especially since many reports are incomplete.

CRD commentary
The authors asked a clear question and adopted a comprehensive literature search strategy. However, details of the checking of relevance and validity and data extraction were lacking. In addition, the numbers of retrieved and included studies were difficult to identify, and there was little information on non-case series studies. No tests for heterogeneity or sensitivity analyses were conducted. The authors acknowledged the unreliability of much of the available incidence data, and the difficulty of attributing causation, and their conclusions seem appropriate.

Implications of the review for practice and research
Practice: Patients should be informed of the risks of spinal manipulation in the same way as they are informed of the risks of conventional medical or surgical interventions.

Research: Accurate incidence data will require large-scale prospective investigations that avoid loss at follow-up.
Bibliographic details

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12015249

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.