

## Cervical manipulation and risk of stroke

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An association between stroke and cervical manipulation has been reported with increasing frequency, and each new report seems to reignite debate between neurologists and chiropractors. Points of disagreement include the validity of the association, the magnitude of the potential risk and the practical implications with respect to patient care. Norris and colleagues<sup>1</sup> described a case series of patients with cervical artery dissection, with the provocative findings that the majority (81%) of patients reported some antecedent sudden neck movement, with neck manipulation being implicated in 28% of cases. (Other surveys by neurologists have estimated the risk of cervical artery dissection following neck manipulation to be of the order of 1 in 500 000 to 1 in 1 million manipulations.<sup>2</sup>) In this issue (page 905), Scott Haldeman and colleagues<sup>3</sup> review malpractice claims for stroke following chiropractic cervical manipulation and conclude that the risk of vertebral artery dissection following cervical manipulation is exceedingly low at approximately 1 in 5.85 million manipulations.

What is the true risk of cervical artery dissection and stroke following cervical manipulation? Unfortunately, the existing data do not permit a definitive answer to this question. The study by Norris and colleagues is laudable in its strict case definition and documentation of cases of arterial dissection. However, although it provides interesting information about potential mechanisms of injury, lack of blinding of the assessors may have led to bias in the assessment of exposure. In addition, case series such as this can never provide an estimate of risk of stroke or even establish a causal relationship between the exposure and the outcome because of the absence of a control group.

The study by Haldeman and colleagues provides important data about the association between stroke and specific chiropractic interventions. However, the use of malpractice claims data is unlikely to lead to an accurate estimation of the risk of stroke. Not all stroke events will lead to claims, and the same biases in documentation of exposure may be operating as in the Norris paper. In addition, this study relies on an estimate of the denominator of cervical manipulations performed by chiropractors.

A theoretically less biased estimate of the risk of stroke secondary to chiropractic manipulation comes from a population-based case-control study using administrative data from Ontario.<sup>4</sup> This placed the risk of stroke for individuals aged under 45 years at about 1.3 per 100 000 chiropractic

visits, with a wide 95% confidence interval of 0.5–16.7 per 100 000. Interestingly, no significant association was found for patients aged over 45 years. Administrative data are also subject to error.

In clinical practice, what advice should clinicians give their patients? The answer must lie in conveying an honest estimate of risk, paired with an unbiased assessment of the potential benefit. However, both sides of this debate suffer from a lack of precise data.

The evidence to date indicates that the risk associated with chiropractic manipulation of the neck is both small and inaccurately estimated. The estimated level of risk is smaller than that associated with many commonly used diagnostic tests or prescription drugs. On the other hand, the expected benefit from the manoeuvre is also difficult to quantify. Systematic reviews of the literature and ratings of appropriateness by an expert panel<sup>5,6</sup> suggest that cervical manipulation or mobilization, or both, provide short-term pain relief and range-of-motion enhancement for the subgroup of individuals with subacute or chronic neck pain. The evidence to support the benefit of cervical manipulation for other indications, including acute neck pain, migraine and other miscellaneous conditions, is far less compelling.

In terms of providing evidence of efficacy, the onus may be placed fairly on practitioners and anyone advocating the expanded application of chiropractic care. This may be particularly true in the case of patients with no current symptoms (i.e., preventive therapy). There is an acute need for further research on the efficacy of chiropractic manipulation for indications to which it is now being widely applied, and for which it is frequently requested.

Responsible practitioners of chiropractic medicine are as motivated as any patient or professional group to obtain sound scientific data on the effectiveness and risks of chiropractic care. Chiropractic colleges and associated professional bodies have invested in the promotion and funding of high-quality research in this area.<sup>7</sup> Agencies that have taken measures to promote chiropractic care research include the Consortial Center for Chiropractic Research established by the US National Institutes of Health, the Research Committee of the Canadian Chiropractic Association (committee established in 1998) and the Canadian Memorial Chiropractic College. Quality research can be produced when it is supported financially. For example, we have seen more research on chiropractic care for low-back pain<sup>8</sup> than for neck pain because of the availability of re-

search dollars for research into back pain, which is a result of its importance in occupational health.

Decision-making with respect to cervical manipulation might be easier if screening manoeuvres could identify patients at increased risk for arterial dissection. Unfortunately, neither clinical risk factors nor premanipulative positional testing have been shown to predict postmanipulative stroke in an individual patient.<sup>5,6,9</sup> In addition, there are inadequate data available regarding which types of manipulation are most likely to be associated with dissection.<sup>9</sup>

What are the practical implications for patient care? Chiropractic care is common, and the vast majority of patients experience no adverse effects; however, the potential risk of stroke is not zero. Given the potentially devastating consequences of arterial dissection, physicians and chiropractors should discuss this risk, however small it may be, with patients contemplating neck manipulation. As with all clinical interventions, the expected benefits of cervical manipulation should not be overstated. Whether the potential risk of stroke is acceptable is a matter for the patient to decide, and the decision will probably, and legitimately, be informed by the patient's subjective assessment of the severity of his or her symptoms and the desirability of this form of intervention.

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Competing interests: None declared.

*Contributors:* The lead author took primary responsibility for critical assessment of the article, seconded by the second author. Both authors reviewed other relevant literature and exchanged opinions on the nature of the commentary that should be provided. The first author prepared the initial outline and draft and the second author prepared the final drafts; in between, they both made revisions.

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