Spinal manipulation: Its safety is uncertain

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Spinal manipulation entails a range of manual manoeuvres that stretch, mobilize or manipulate the spine, paravertebral tissues and other joints in order to relieve spinal pain and improve locomotor function. Spinal manipulation is practised by chiropractors, osteopaths, physicians and physiotherapists, mostly to treat musculoskeletal problems such as back and neck pain.[1] The popularity of chiropractic services in the general population is high: 7% of people in the United States visited a chiropractor at least once in 1997, and as many as 33% in the United Kingdom did so in 1996.[2] The safety of spinal manipulation, therefore, is an issue that requires regular and rigorous assessment.

In particular, manipulation of the upper spine has been associated with serious adverse events. A recent retrospective case–control study from Ontario yielded perhaps the most conclusive findings so far.[3] It showed that, among people younger than 45 years, the odds of experiencing a vertebrobasilar accident (VBA) was increased 5 times if they saw a chiropractor within the week before the event (odds ratio [OR] 5.03 for chiropractic visits of any type [95% confidence interval (CI) 1.32–43.87, $p = 0.006$] and OR 5.52 for chiropractic visits with a cervical diagnosis [95% CI 1.03–72.02, $p = 0.009$]). Of the 582 cases of VBA included in this study, 57 were associated with visits to chiropractors. The authors concluded that these results were "consistent with a positive association in young adults" but warned that potential sources of bias have to be considered.

Yet unbiased findings are incredibly hard to come by. Our group recently conducted a survey of all neurologists in Britain.[4] Our main research question was whether they had seen cases of serious neurological complications occurring 24 hours after cervical spinal manipulation during the past year. Twenty-four respondents had observed 35 such cases, none of which had been reported. Ten cases were of vascular accidents. Sadly, survey data are never free from bias, and we would certainly not claim that our results are conclusive.

Case reports can be valuable in several respects. Their important disadvantage is that they may indicate only the tip of a much bigger iceberg of problems, particularly as no reliable system exists to record adverse events comparable, for instance, to post-marketing surveillance of drug therapies. Recent reports (published since 1995) of complications associated with spinal manipulation include dissection of the vertebral and internal carotid artery, epidural hematoma, intracranial aneurysm, cauda equina syndrome, contusion of the spinal cord, myelopathy, radiculopathy and peripheral nerve palsy.[5] Unfortunately such case reports, even though valuable for pointing us to potential problems, do not bring us closer to defining the incidence of adverse effects of spinal manipulation.

Clearly, the best way forward is to look at prospective studies. Six such reports were found in a recent systematic review;[6] in total they included over 2000 patients. Not a single case of a serious adverse event was reported. However, about 50% of the patients experienced mild and transient adverse effects (e.g., local discomfort, headache, tiredness and radiating discomfort) after the procedure.

These studies exemplify the difficulties in systematically collecting prospective information about adverse effects and complications of spinal manipulation. In the 2 largest prospective studies (involving 1058 and 625 patients respectively), loss at follow-up was a potentially serious problem.[7,8] Their design was such that adverse events after one treatment were assessed at each subsequent consultation. Almost by definition, patients who experienced a severe adverse effect would simply not return for such a follow-up visit. It is therefore hardly surprising that only mild complaints were registered in these studies.[6] To date, no prospective investigation of adverse events of spinal manipulation is available that has overcome this problem. The pessimist (and in matters of safety one is wise to take the pessimist's view) therefore suspects that the existing data are accurate only for minor complaints.

Current chiropractic practice seems to take little account of these problems. Either the fact that about 50% of patients will experience mild adverse events is completely ignored or these events are labelled as necessary experiences on the patient's path to clinical improvement. Critical statements about the value of spinal manipulation get denounced as "misleading" or "deceitful."[9] Patients continue to be advised that chiropractic is devoid of risks (unpublished data). Early warning symptoms of vascular accidents are often ignored; in their systematic review of the subject, Hurwitz and Morgenstern[10] stated that, "in many cases, the manipulator failed to cease treatment even after the patient experienced signs and symptoms of vertebrobasilar ischemia (e.g., dizziness, vertigo, nausea, loss of consciousness)." One gets the impression that the risks of spinal manipulation are being played down, particularly by chiropractors. Perhaps the best indication that this is true

are estimates of incidence rates based on assumptions, which are unproven at best and unrealistic at worse. One such assumption, for instance, is that 10% of actual complications will be reported. Our recent survey, however, demonstrated an underreporting rate of 100%.[4] This extreme level of underreporting obviously renders estimates nonsensical.

What is the message for primary care physicians? On the one hand, there is little evidence to demonstrate that spinal manipulation has any specific therapeutic effects.[11] On the other hand, there is convincing evidence to show that it is associated with frequent, mild adverse effects[6] as well as with serious complications of unknown incidence.[3–5] Therefore, it seems debatable whether the benefits of spinal manipulation outweigh its risks.[12] Specific risk factors for vascular accidents related to spinal manipulation have not been identified,[10] which means that any patient may be at risk, particularly those below 45 years of age.[3] Definitive, prospective studies that can overcome the limitations of previous investigations are now a matter of urgency. Until they are available, clinicians might tell their patients to adopt a cautious approach and avoid the type of spinal manipulation for which the risk seems greatest: forceful manipulation of the upper spine with a rotational element.

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