Life-Threatening Complications of Spinal Manipulation

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Spinal manipulation entails high-velocity, low-amplitude manual thrusts to spinal joints that extend slightly beyond their physiological range of motion. It is a therapeutic technique often, but not exclusively, used by chiropractors who tend to believe that it is not associated with relevant risks. This opinion is contrasted by the findings of systematic reviews,1 which summarize several hundred cases of serious complications after spinal manipulation, mostly of the upper spine. Chiropractors rightly point out that many of these instances relate to events that happened decades ago. Thus, it is relevant to ask whether life-threatening complications still occur or whether therapists have now learned how to avoid such effects.

Spinal manipulation has recently been associated with dissection of the vertebral2 and internal carotid artery,3 resulting in strokes and at least 1 death.4 Other recent instances relate to epidermal hematoma,5 intracranial aneurysm,6 cauda equina syndrome,7 contusion of the spinal cord,8 myelopathy and radiocolopathy,9 as well as palsy of the long thoracic nerve.10 Case series from the Ukraine,11 Sweden,12 and Germany13 have contributed 49, 21, and 10 further patients, respectively, who suffered life-threatening events after spinal manipulation. Retrospective surveys carried out with doctors in California,14 Ireland,15 and Great Britain16 brought a total of 145 further series cases to light that would otherwise not have been documented in the medical literature.

None of these reports lends itself to defining incidence figures. The best way to arrive at such information is to prospectively study large samples of consecutive patients. Five such investigations have been published, and none prospectively study large samples of consecutive patients. This apparently confirms the assumption that complications are extreme rarities. Vis a vis the many thousand manipulations carried out daily, 200 or 300 complications in 5 years could be almost negligible. While we all hope that this is true, one must consider underreporting: if a patient suffers a serious complication after spinal manipulation, her chiropractor is unlikely to see her again, and the physicians who do might not think of a link between manipulation and the adverse effect. And even if they consider an association, are they likely to publish this as a case report? Moreover, none of the prospective studies available to date17 have enough power to detect events that occur less frequently than 1 in approximately 500 patients. Interestingly, most of these studies agree that mild, transient adverse effects (eg, local discomfort) are experienced by roughly every second patient who receives spinal manipulation.17

Where does this leave us when trying to critically evaluate the safety of spinal manipulation? We know that serious complications do exist. We also know of plausible explanations of how spinal manipulation might lead to serious adverse events; eg, sudden rotational and hyperextension head movements can cause a traumatic dissection of the extracranial arteries.2 The incidence of life-threatening complications, however, is unknown, and previous estimates have all been based on assumptions which may or may not be true. The true risk might well be minor, but in matters of patients' safety we require certainty. The only logical conclusion is that large, prospective studies are needed which are designed to generate reliable incidence figures even of rare events. To ignore this need is to neglect the best interests of our patients.

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