Clinical perceptions of the risk of vertebral artery dissection after cervical manipulation: the effect of referral bias.

Haldeman S, Carey P, Townsend M, Papadopoulos C

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Authors: Haldeman S, Carey P, Townsend M, Papadopoulos C


Institution: Department of Neurology, University of California, 101 City Drive, Orange, CA 92868, USA. HaldemanMD@aol.com


Abstract: BACKGROUND CONTEXT: The growing recognition of cervical manipulation as a treatment of neck pain and cervicogenic headaches has lead to increased interest in potential...
complications that may result from this treatment approach. Recent surveys have reported that many neurologists will encounter cases of **vertebral artery dissection** that occur at various times after cervical manipulation, whereas most practitioners of spinal manipulation are of the opinion that these events are extremely rare. We asked the question whether these differences in perception could be explained in part by referral or selection bias. **PURPOSE:** To assess the effect of referral bias on the differences in perceived incidence of **vertebral artery dissection** after cervical manipulation between neurologists and chiropractors in Canada. **STUDY DESIGN:** This study was a retrospective review of cases where neurological symptoms consistent with cerebrovascular ischemia were reported by chiropractors in Canada. **METHODS:** An analysis of data from a chiropractic malpractice insurance carrier (Canadian Chiropractic Protective Association [CCPA]) and results of a survey of chiropractors was performed to determine the likelihood that a **vertebral artery dissection** after cervical manipulation would be reported to practicing chiropractors. This was compared with the likelihood that a neurologist would be made aware of such a complication. **RESULTS:** For the 10-year period 1988 to 1997, there were 23 cases of **vertebral artery dissection** after cervical manipulation reported to the CCPA that represents 85% of practicing chiropractors in Canada. Based on the survey, an estimated 134,466,765 cervical manipulations were performed during this 10-year period. This gave a calculated rate of **vertebral artery dissection** after manipulation of 1:5,846,381 cervical manipulations. Based on the number of practicing chiropractors and neurologists during the period of this study, 1 of every 48 chiropractors and one of every two neurologists would have been made aware of a vascular complication from cervical manipulation that was reported to the CCPA during their practice lifetime. **CONCLUSIONS:** The perceived risk after cervical manipulation by chiropractors and neurologists is related to the probability that a practitioner will be made aware of such an incident. The difference in the number of chiropractors (approximately 3,840 in 1997) and neurologists (approximately 4,000 in 1997) in active practice and the fact that each patient who has a stroke after manipulation will likely be seen by only one chiropractor but by three or more neurologists partly explains the difference in experience and the perception of risk of these two professions. This selection or referral bias is important in shaping the clinical opinions of the various disciplines and distorts discussion on the true incidence of these complications of cervical manipulation. The nature of
this study, however, describes the likelihood that a clinician will be made aware of such an event and cannot be interpreted as describing the actual risk of stroke after manipulation.

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