

Cervical Manipulation and the Myth of Stroke

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CERVICAL MANIPULATIVE THERAPY (CMT)

is a treatment that is commonly used by chiropractic physicians for neck pain and headache. It is well accepted in chiropractic medicine as a beneficial and safe treatment method. However CMT has had its share of controversy within the medical profession, particularly among neurologists and, to a lesser extent, neurosurgeons. This primarily relates to concerns about the safety of CMT. A number of publications have appeared in the neurology and neurosurgery literature warning of the “dangers”¹ of this “potentially fatal”² form of treatment. Perhaps the most controversial and sensationalistic condition that has been associated with CMT is **vertebral artery dissection (VAD)** and its related stroke. The purpose of this paper is to examine the evidence of the risk of CMT with regard to VAD as well as to discuss the significance of our current understanding of this risk for chiropractic and medical physicians.

VAD is an uncommon cause of stroke that involves a tear in the vertebral artery leading to stroke.³ VAD accounts for only 0.4 – 2.5% of all strokes and tends to occur in younger individuals, with the peak incidence occurring in the 40s.³ Patients who develop VAD have a structural defect in the vertebral arteries that predisposes them to develop this disorder.³ Importantly, in 80% of cases the initial symptom is neck pain with or without headache.³

How Did CMT and VAD Become Associated?

A number of case reports published over the course of several decades recounted patients who had received CMT and subsequently experienced a stroke related to VAD.⁴ These were single cases reported in which the natural assumption was that the CMT directly caused the VAD and stroke. Two later retrospective surveys were published, one of neurologists⁵ and the other of chiropractors,⁶ in which practitioners had been asked to recall how many cases of VAD after CMT they had been exposed to in the previous two years⁵ and ten years,⁶ respectively. Again, the as-

sumption in these publications was that a direct causal relation existed between CMT and VAD with CMT as cause and VAD as effect. This was a reasonable assumption given the VAD occurred after the CMT, although in many cases the VAD did not occur until weeks after the CMT.

CASE-CONTROL STUDIES

Four case-control studies have been published. The first⁷ was a six-year study in which 582 patients who had experienced VAD were compared to 2,328 people with no history of stroke. The study found that VAD patients who were under age 45 were five times more likely than controls to have visited a chiropractor within 30 days of having had their stroke. There was no association between a visit to a chiropractor and VAD in patients 45 and older. The second case control study⁸ in which 51 patients with cervical artery dissection, 25 involving the vertebral artery (i.e., VAD) and 26 involving the internal carotid artery, were compared with 100 controls who had other types of stroke. The authors found that individuals with VAD (though not individuals with internal carotid artery dissection) were six times more likely to have seen a chiropractor within 30 days of their stroke. The third case control study⁹ examined 47 patients with either VAD or internal carotid artery dissection (they did not distinguish between these types of stroke) and 47 patients with other types of stroke. They compared the two groups with regard to exposure to a number of mechanical events including CMT, lifting, mild trauma, sexual intercourse and athletic activity. They found no association between any of the mechanical events, including CMT and cervical artery dissection.

Two of these three case control studies found an association between CMT and VAD.^{7, 8} Two possible explanations for this association were suggested by the authors of these studies:

- CMT can cause VAD in rare cases
- Patients with VAD consult chiropractors for the initial symptoms

of VAD (neck pain with or without headache and sometime after the visit develop the remaining symptoms of VAD (symptoms of neural ischemia in the territory of the posterior circulation).

In addition, the study that found no association may have simply not had sufficient numbers of subjects to make an inference.

None of these studies was designed in a way that allowed one to distinguish between these possibilities. This led to the most recent case control study,¹⁰ replicating the Rothwell, et al⁷ study with an important addition: they included not only visits to chiropractors prior to the VAD event but also visits to **primary care practitioners (PCPs)**. The study covered 109,020,875 person-years of observation over a nine year period. The cases were 818 patients with VAD and the controls were 3,164 age- and sex-matched individuals with no history of stroke. With regard to the association between visits to chiropractors and VAD the findings of this study were similar to that of Rothwell, et al.⁷ In individuals under 45 years of age there was an increased association between VAD and visits to chiropractors within 30 days. No such association was found in individuals age 45 and older. However an increased association was also found between VAD and visits to PCPs within 30 days. There was no statistical difference between the likelihood of VAD after having seen a PCP vs. after having seen a chiropractor. In fact, in contrast to what was found in patients who had seen chiropractors, the increased association between a visit to a PCP and the occurrence of VAD was found both in individuals under age 45 and those age 45 and older. Importantly, the association was greatest in cases in which the practitioner visit was for neck pain or headache. So in examining which of the two likely explanations for the association between CMT and VAD this study provided two possibilities:

- Both chiropractors and PCPs cause VAD on rare occasions.

- Patients with VAD consult chiropractors or PCPs for the initial symptoms of VAD and sometime after the visit develop the remaining symptoms of VAD.

It would be difficult to fathom what PCPs are doing that would cause dissection of a vertebral artery. Therefore, the second possible explanation is the likely one, i.e., in 80% of cases of VAD the initial symptom is neck pain and/or headache. Patients who develop these symptoms typically consult either their PCP or a chiropractor in seek of relief. At some point after this visit they develop the full manifestation of stroke related to VAD, incidental to anything either practitioner did. Indeed, the conclusion of the authors of the Cassidy, et al study¹⁰ was “This suggests that patients with undiagnosed vertebral artery dissection are seeking clinical care for headache and neck pain before having a VBA stroke.”¹⁰

There have been published cases in which a patient without symptoms of neck pain or headache has experienced VAD after CMT (it is not uncommon for some chiropractors to theorize that treating one area of the spine affects problems in other areas). Thus it may be possible for CMT to hasten VAD in a patient who is already predisposed to this disorder. However, if this is possible it would have to be so exceedingly rare that the Cassidy et al study,¹⁰ which covered over 109 million person-years over a ten-year period, failed to detect it.

The current best evidence with regard to VAD has important implications for both medical physicians and chiropractic physicians.⁴ Medical physicians, particularly neurologists and neurosurgeons need not be concerned about CMT being a cause of stroke. Given the evidence of effectiveness of this form of treatment for neck pain and headache¹¹ the risk: benefit ratio is very favorable.

For both chiropractic physicians and PCPs, as well as others who see patients with neck pain and headache, it is important to be aware of the possibility that the patient may have VAD in development.⁴ Many patients will not have any detectable signs or symptoms that would alert the practitioner to this possibility. However as the clinical manifestation of neural ischemic findings can develop gradually,

there may be subtle findings that can be useful for the practitioner in suspecting the presence of VAD.⁴

In addition, the new understanding of the relationship between CMT and VAD potentially opens the door to improved relations and cooperation between doctors of chiropractic and medical physicians. The traditional antagonism between these professions, partially represented by the controversy over the perceived risks of CMT, has been one that has made collaboration difficult. Although relations between the professions has certainly improved in recent years, and interdisciplinary collaboration has become more common, a better mutual understanding and respect can go a long way toward improving care for patients with spine related disorders.

CONCLUSION

CMT and VAD have been linked in controversy for a number of years. This relationship has been a source of consternation between chiropractors and medical physicians, particularly neurologists. Current best evidence has found no convincing support for a causal relation between CMT and VAD and that patients with VAD seek the care of chiropractors or PCPs for the initial symptoms of the disorder, developing stroke after this unrelated to the manipulation. This is still a contentious notion however.¹² Better understanding of a lack of causal relation between CMT and VAD should open the door to improved relations between chiropractic medicine and allopathic medicine which has the potential to translate into improved coordination of care for patients with spine related disorders.

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