

AMERICAN OSTEOPATHIC ASSOCIATION POSITION PAPER ON OSTEOPATHIC MANIPULATION TREATMENT OF THE CERVICAL SPINE

Background and Statement of Issue

There has recently been an increasing concern about the safety of cervical spine manipulation. Specifically, this concern has centered on devastating negative outcomes such as stroke. This paper will present the evidence behind the benefit of cervical spine manipulation, explore the potential harm and make a recommendation about its use.

Benefit

Spinal manipulation has been reviewed in meta-analysis published as early as 1992, showing a clear benefit for low back pain.¹ There is less available information in the literature about manipulation in regards to neck pain and headache, but the evidence does show benefit.^{2,3,4,5,6} There have been at least 12 randomized controlled trials of manipulative treatment of neck pain.

Some of the benefits shown include relief of acute neck pain, reduction in neck pain as measured by validated instruments in sub-acute and chronic neck pain compared with muscle relaxants or usual medical care. There is also short-term relief from tension-type headaches.⁷ Manipulation relieves cervicogenic headache and is comparable to commonly used first line prophylactic prescription medications for tension-type headache and migraine.⁸ Meta-analysis of 5 randomized controlled trials showed that there was a statistically significant reduction in neck pain using a visual analogue scale.⁹

Harm

Since 1925, there have been approximately 275 cases of adverse events reported with cervical spine manipulation.^{10,11,12, 13} It has been suggested by some that there is an under-reporting of adverse events.¹⁰ A conservative estimate of the number of cervical spine manipulations per year is approximately 33 million and may be as high as 193 million in the US and Canada.^{14,15} The estimated risk of adverse outcome following cervical spine manipulation ranges from 1 in 400,000 to 1 in 3.85 million manipulations.^{16, 17,18,19} The estimated risk of major impairment following cervical spine manipulation is 6.39 per 10 million manipulations.²⁰

Most of the reported cases of adverse outcome have involved “Thrust” or “High Velocity/Low Amplitude” types of manipulative treatment.¹¹ Many of the reported cases do not distinguish the type of manipulative treatment provided. However, the risk of a vertebral artery dissection (VAD) occurring spontaneously, is nearly twice the risk of a VAD resulting from cervical spine manipulation.⁷ This includes cases of ischemic stroke and vertebral artery dissection.

A concern has been raised by a recent report that VAD following cervical spine manipulation is unpredictable.¹⁰ This report is biased because all of the cases were involved in litigation.

The nature of litigation can lead to inaccurate reporting by patient or provider. However, it did conclude that VAD following cervical spine manipulation is “idiosyncratic and rare”. Further review of this data showed that 25% of the cases presented with sudden onset of new and unusual headache and neck pain often associated with other neurologic symptoms that may have represented a dissection in progress.²¹

In direct contrast to this concern of unpredictability, another recent report states that cervical spine manipulation may worsen preexisting cervical disc herniation or even cause cervical disc herniation. This report describes complications such as radiculopathy, myelopathy, and vertebral artery compression by a lateral cervical disc herniation.¹² The authors concluded that the incidence of these types of complications could be lessened by rigorous adherence to published exclusion criteria for cervical spine manipulation.¹² The current literature does not clearly distinguish the type of provider (i.e. M.D., D.O., D.C. or P.T.) or manipulative treatment (manipulation vs mobilization) provided in cases associated with VAD. This information may help to understand the mechanism of injury leading to VAD, as there are differences in education and practice among the various professions that utilize this type of treatment.

Comparison of Alternative Treatments

NSAIDs are the most commonly prescribed medications for neck pain. Approximately 13 million Americans use NSAIDs regularly.³² 81% of GI bleeds related to NSAID use occur without prior symptoms.³² Research in the United Kingdom has shown NSAIDs will cause 12,000 emergency admissions and 2,500 deaths per year due to GI tract complications.²² The annual cost of GI tract complications in the US is estimated at \$3.9 billion, with up to 103,000 hospitalizations and at least 16,500 deaths per year.^{23,24.} ³² This makes GI toxicity from NSAIDs the 15th most common cause of death in the United States.³²

Epidural steroid injection is a popular treatment for neck pain. Common risks include subdural injection, intrathecal injection and intravascular injection.³⁵ Subdural injection occurs in ~ 1% of procedures.³⁵ Intrathecal injection occurs in ~ 0.6-10.9% of procedures.³⁵ Intravascular injection is the most significant risk and occurs in ~ 2% of procedures and ~ 8% of procedures in pregnant patients.³⁵ Cervical epidural abscess is rare, but has been reported in the literature.³⁶

Provocative Tests

Provocative tests such as the DeKline test have been studied in animals and humans. This test and others like it were found to be unreliable for demonstrating reproducibility of ischemia or risk of injuring the vertebral artery.^{25,26,27,28,29,30}

Risk factors

VBA accounts for 1.3 in 1000 cases of stroke, making this a rare event. Approximately 5% of patients with VBA die as a result, while 75% have a good functional recovery.³³ The most common risk factors for VBA are migraine, hypertension, oral contraceptive use and smoking.³¹ Elevated homocysteine levels, which have been implicated in cardiovascular disease, may be a risk factor for VBA.³⁴

A study done in 1999 reviewing 367 cases of VBA reported from 1966-1993 showed 115 cases related to cervical spine manipulation; 167 were spontaneous, 58 from trivial trauma and 37 from major trauma.³¹

Complications from cervical spine manipulation most often occur in patients who have had prior manipulation uneventfully and without obvious risk factors for VBA.⁷ "Most vertebrobasilar artery dissections occur in the absence of cervical manipulation, either spontaneously or after trivial trauma or common daily movements of the neck, such as backing out of the driveway, painting the ceiling, playing tennis, sneezing, or engaging in yoga exercises."¹⁰ In some cases manipulation may not be the primary insult causing the dissection, but an aggravating factor or coincidental event.²¹

It has been proposed that thrust techniques that use a combination of hyperextension, rotation and traction of the upper cervical spine will place the patient at greatest risk of injuring the vertebral artery. In a retrospective review of 64 medical legal cases, information on the type of manipulation was available in 39 (61%) of the cases. 51% involved rotation, with the remaining 49% representing a variety of positions including lateral flexion, traction and isolated cases of non-force or neutral position thrusts. Only 15% reported any form of extension²¹

Conclusion

Osteopathic manipulative treatment of the cervical spine, including but not limited to High Velocity/Low Amplitude treatment, is effective for neck pain and is relatively safe, especially in comparison to other common treatments. Because of the very small risk of adverse outcomes, trainees should be provided with sufficient information so they are advised of the potential risks. There is a need for research to distinguish the risk of VBA associated with manipulation done by provider type and to determine the nature of the relationship between different types of manipulative treatment and VBA.

Therefore, it is the position of the American Osteopathic Association that all modalities of osteopathic manipulative treatment of the cervical spine, including High Velocity/Low Amplitude, should continue to be taught at all levels of education, and that osteopathic physicians should continue to offer this form of treatment to their patients.

Adopted by AOA House of Delegates July 14, 2005

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