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LETTER TO THE EDITOR

Selective criticism confounds objective evaluation of case report on spinal manipulation and vertebral artery dissection

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Dear Editor-in-Chief,

I read the Romozzi et al. [1] case report and the Letter to the Editor in response from Albertson, et al. [2] Romozzi et al. proposed a plausible argument for causation of vertebral artery dissection (VAD) in a case of spinal manipulative therapy (SMT). Albertson et al. ignored the plausibility of the argument and instead criticized the article for reasons unrelated to the hypothesis of Romozzi et al.

Albertson et al. opine that the terms VAD and cervical artery dissection (CAD) were used incorrectly. VAD is subset of CAD, which also includes internal carotid artery dissection (ICAD). Review of the case report reveals these terms were used appropriately. CAD was used in the context of the Biller et al. study, which studied cervical artery dissections, per the title of the study [3]. They also state that the V2 segment of the vertebral artery is not likely to dissect from SMT. This would be the case in an artery not at risk for dissection. They are ignoring the hypothesis of the case report, which is that the artery was at risk for dissection in this 25-year-old female patient with a 10-year history of migraine without aura [4].

Albertson et al. opine that statements that SMT has a known causal relationship with VAD are unsubstantiated. However, Romozzi et al. make no such statements. Romozzi et al. cite the Mikkelsen et al. case report to support that SMT has a known *association* with VAD [5].

Albertson et al. cite Church et al. which concludes there is no convincing evidence of a causal relationship between SMT and CAD. However, this study does not stratify for predisposing conditions like migraine [6]. They also cite Whedon et al., which found no significant association between chiropractic Manipulation and stroke in Medicare beneficiaries aged 66–99 years [7]. However, this study is limited to older adults and does not account for younger patients with migraine. Furthermore, Whedon et al. does not address the potential interaction between migraine-related vascular changes and mechanical stress from CSM.

Albertson et al. minimize the clinical presentation, stating that, "Outside of the description that the migraine lasted for a few more days compared to the patient's ten-year history of migraines, there was nothing unusual reported about the patient's symptoms prior to or after SMT to suggest sinister pathology." This is not the case. The patient sought treatment for her usual Migraine symptoms, which typically lasted 24 h and were responsive to NSAIDs. Immediately after SMT, she experienced right-sided head pain lasting over 10 days, unresponsive to NSAIDs, indicating a new etiology. Albertson et al. hypothesize that the VAD predated SMT, with symptoms mistaken for a migraine. However, the abrupt shift to persistent, unresponsive symptoms post-SMT suggests VAD occurred after manipulation, not before.

Albertson et al. opine that the absence of ischemic symptoms after SMT in this case is evidence that SMT had no temporal relationship with the onset of symptoms. This is difficult to understand. Cerebral ischemic symptoms are, by definition, symptoms of ischemic stroke. This patient did not suffer an ischemic stroke; she suffered a VAD. They also observe that no VAD was found on CT brain imaging when the patient presented to the emergency room after three days of persistent headache following SMT. However, no CTA or MRA neck imaging to evaluate for VAD was performed.

Albertson et al. cite Gorrell et al. [8] to claim SMT does not stretch vertebral arteries enough to cause dissection. This is true for arteries not at risk for dissection but not relevant here, as Gorrell et al. did not assess migraineurs. Reliance on such cadaver studies is limited in this context, as cadaveric models may not account for in-vivo vulnerabilities associated with migraine. They further cite Kocabey et al. to support that SMT does not significantly alter blood flow in the vertebral arteries [9]. This is again true, but not

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relevant. Romozzi et al. do not make any arguments regarding the effects of SMT on blood flow.

Albertson et al. opine that a case report alone cannot establish causation, which is correct. However, randomized controlled trials (RCTs) on CAD to definitely establish causation are unethical and infeasible due to the life-threatening nature and rarity of CAD. In the absence of RCTs, the next best available evidence must be considered.

A weakness of the Romozzi et al. case report may be that they did not formally make their causation argument. Using the best available evidence, causation can be established as more likely than not with a three-step causation argument based on biological plausibility, temporal association, and the absence of more likely explanations [10]. In this case:

1. SMT causing VAD in a migraine-prone artery is biologically plausible [4].
2. There was an immediate temporal association between CSM and symptoms of VAD.
3. There is not a more plausible alternative explanation for the cause of the VAD. Albertson et al. propose that the VAD was spontaneous and present prior to SMT. While spontaneous VAD is possible, the immediate onset of persistent, unresponsive symptoms post-SMT, unlike the patient's typical 24-hour migraines, makes a manipulation-related cause more plausible than a pre-existing or spontaneous VAD.

I thank Dr. Romozzi and her colleagues for their case report. It is my opinion that a history of migraine should be considered a relative contraindication to cervical spine SMT, and perhaps an absolute contraindication pending further research. No current practice guidelines recognize migraine as a contraindication to cervical spine SMT. This gap may stem from limited clinical evidence on migraine-related vascular risks, which this case addresses. Case reports like this, supported by evidence of migraine-related vascular vulnerabilities [4], highlight the need to re-evaluate standards of care to enhance patient safety.

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Declarations

Ethical approval Not applicable.

Competing interests No competing interests.

Conflict of interest No conflict of interest.

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