Letter to the Editor

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Influence of an osteopathic manipulative intervention on cerebral blood velocity changes: do we have the whole story to appropriately interpret the data?

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We read with interest the article by Roberts et al. that was recently published in this journal [1]. The authors performed a randomized, single-blinded, two-period, two-treatment crossover study to evaluate the impact of the occipitoatlantal decompression, compared to a sham manipulation, on intracranial and extracranial blood velocity responses in young healthy participants. The authors [1] reported increased end-diastolic velocity in the internal carotid artery (ICA), vertebral artery (VA), and middle cerebral artery (MCA) following the intervention but not after the sham treatment.

Several mechanisms intricately work interdependently to determine adequate cerebral blood flow (CBF) [2, 3]: cerebrovascular reactivity to blood gases [4], cerebral autoregulation [5], neurovascular coupling [6], neurogenic factor [7, 8], and systemic factor [9]. Although the authors reported no changes in heart rate and blood pressure with the osteopathic manipulation, one major mechanism was not considered in this study. Indeed, carbon dioxide is a potent CBF determinant [4]. Surprisingly, arterial partial pressure of carbon dioxide was omitted from data collection nor was its absence addressed in discussion of study limitations. Without inclusion of this important variable, it is difficult to ensure blood velocity changes reported by the authors are a direct consequence of the osteopathic manipulation.

Another crucial methodological consideration is that cerebral blood velocity is representative of CBF only if the diameter of cerebral arteries remains stable [10]. It would have thus been interesting to monitor ICA and VA blood flow – not only blood velocity – since it is feasible to measure the diameter of these extracranial arteries. Regarding the MCA, it is not possible to measure its diameter with transcranial Doppler ultrasound, which is another important but unaddressed limitation of this study. Interpreting these cerebral blood velocity changes as representing CBF changes following the osteopathic manipulative intervention without appropriate nuances and caveats is problematic. Knowing if an osteopathic manipulative intervention increases or decreases CBF is relevant for a safe and efficient practice. However, end-diastolic velocity alone may not be sufficient [11–13].

The authors [1] are congratulated for their effort aimed at examining the influence of an osteopathic manipulation on cerebral blood velocity responses. This being acknowledged, concomitant examination of key CBF determinants, appropriately interpreted cerebral blood velocity data, and/or inclusion of volumetric blood flow are essential in future studies to provide an adequate understanding of the short- and long-term cerebrovascular consequences of osteopathic manipulative interventions.

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