International Journal of Osteopathic Medicine (2015) 18, 33—39

ELSEVIER

International Journal of Osteopathic Medicine

www.elsevier.com/ijos

RESEARCH REPORT

The accuracy of osteopathic manipulations of the lumbar Spine: A Pilot study

Emmanuel Frantzis [a], Philippe Druelle [a], Kim Ross [b], Stuart McGill [c,*]

[a] *Canadian College of Osteopathy, Toronto, Canada*
[b] *Canadian Memorial Chiropractic College, Toronto, Canada*
[c] *Spine Biomechanics Laboratories, Department of Kinesiology, University of Waterloo, Canada*

Received 10 February 2014; revised 12 September 2014; accepted 23 September 2014

KEYWORDS
Lumbar adjustments;
Lumbar spine;
Spinal manipulation;
Osteopathy;
Orthopaedics

Abstract *Objective:* To assess the segmental specificity, or accuracy, of osteopathic lumbar spinal manipulations.
Background: Prior studies of chiropractic technique of manual manipulations of the spine designed to target abnormal tissue have been shown to be inaccurate, resulting in adjustments of segments other than the targeted level. This can result in manipulations of areas other than the level of interest of a therapist.
Methods: Cross-sectional investigation of a convenience sample. Twenty subjects, 14 males and 6 females (mean age = 31.2 years), participated. Eighteen subjects received 2 manipulations and 2 subjects received 3 manipulations that were performed by an experienced osteopath, totalling 42 manipulations. If present, cavitations were recorded using accelerometers from which, quantifying the time to target, revealed the source location. The osteopath and subjects were also asked to report their perception regarding any "clicking" (signifying a cavitation) during manipulations.
Results: In 12 of the 20 subjects (60%) there was at least one cavitation recorded. Sixteen of the 38 recorded manipulations produced at least one cavitation. Eight (50%) of these were accurate to the intended target. The mean distance between the site of cavitation and the intended target (error) was 5.31 cm. Regression analysis revealed no statistically significant relationship between the site of cavitation and intended target ($p = 0.718$). There was an increased number of attempts to

* Corresponding author. University of Waterloo, 200 University Ave. Waterloo, Ontario, Canada, N2L 3G1. Tel.: +1 519 888 4567x36761; fax: +1 519 746 6776.
E-mail address: mcgill@uwaterloo.ca (S. McGill).

http://dx.doi.org/10.1016/j.ijosm.2014.09.001

adjust upper lumbar segments (L1, L2) compared to lower segments (L3, L4); however, there was error inferior to the target segment for 18 of the 23 cavitations (78%).
Conclusions: These results suggest that osteopathic techniques employed in this study were no different in terms of accurately directing treatment to a specified spinal segment (the mean error was 1 segment away from the intended target segment) than those previously observed using chiropractic techniques.

Implications

- These data suggest that osteopathic techniques employed in this study were not accurate in terms of direct treatment to specific motion segments assessed to be pathologic.
- This work, combined with our similar work with other clinical professions, suggests that the influence on neural variables may not need segmental specificity to create a clinical effect.

Introduction

Osteo-articular spinal manipulations are among the most important tools in osteopathy.[1] It is often assumed by those in the field of osteopathy that these techniques are both specific and accurate in their effect, yet no evidence exists to support this claim. In theory, the practitioner seeks out vertebral segments through mobility tests or palpatory techniques that are 'rigid' or lack mobility.[1,2] There are 4 primary types of dysfunctions that have been hypothesized to respond to spinal manipulation, these include: release of hypertonic muscles, release of entrapped synovial folds, disruption of articular adhesions and unbuckling of motion segments that have been disproportionately displaced.[3,4] Once diagnosed and a location determined, an appropriate manual manipulation technique intended to correct the dysfunction, or normalize the abnormal tissues, is applied to the target spinal level.[2,5] Often an audible cavitation or 'cracking' noise is heard.[5] This sound will be referred to as the cavitation, in this paper, without any further implication of the sound source. Various authors have suggested the cavitation is an indicator of the success of the adjustment,[6–9] while others have argued the audible release by itself does not evoke a tissue response.[10] It has been accepted that the cavitation location indicates the level reacting to the adjustment.[6] The question addressed here is whether or not a directed treatment has actually affected the desired vertebral level. Several studies have brought into question the actual mechanisms of the effects of spinal manipulation,[6,8,11] while others have implied that what a practitioner feels may not be as accurate as they suspect. Ross et al.[5] showed that the vibrations associated with a cavitation, may actually originate from a segment several levels away from the desired treatment target, at least with Chiropractic manipulation. In that study, twenty eight licensed chiropractors performed spinal manipulations on sixty-four volunteers. Thirty-six of 52 manipulations had at least 1 cavitation accurate to target (36/52 = 69%). But since most manipulative procedures resulted in multiple cavitations, the percentage of cavitations that were accurate to their intended segment was less (57 of 124 cavitations = 46%). The average distance of the cavitation from the desired location in the lumbar spine was found to be 5.29 cm (greater than one vertebral level away from the intended vertebra). The authors concluded that manipulation of the lumbar spine is not accurate to the intended target. Several osteopaths suggested that their techniques were different and more accurate, which motivated this study.

The goal of this study was to determine the accuracy of osteopathic adjustments to the intended level in the lumbar spine.

Methods

Volunteer subjects were a convenience sample, recruited from advertising posters in the office of the researcher and the Canadian College of Osteopathy. Those who met all the inclusion criteria, and were deemed suitable for the study following a physical examination completed and signed an informed consent form. The list of inclusion criteria follows: