Does an audible release improve the outcome of a chiropractic adjustment?

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Clinical scenario A 24-year-old female presented to the chiropractic clinic with low back pain and neck pain. During the chiropractic treatment, the patient enquired about the significance of the "crack" that accompanied the adjustment. The audible release is a phenomenon that is familiar to chiropractors. Although it is widely accepted that this "cracking" sound is generated by a cavitation mechanism, there are a number of opinions regarding the significance of the audible release to a chiropractic adjustment. The author wonders if there is any evidence to suggest that an audible release is a necessary component to a successful adjustment.

Three part question For [a chiropractic adjustment] does [an audible release] improve [outcome]?

Search strategy A computerised literature search was conducted on the following databases: Allied and Complementary Medicine Allied (AMED), Index to Chiropractic Literature (ICL), Manual, Alternative and Natural Therapy (MANTIS) and Medline (Pub Med). In addition the Journal of Manipulative and Physiological Therapeutics (JMPT), Spine, and the Archives of Physical Medicine and Rehabilitation where searched. The following terms where used for the search: cavitation AND (sound OR sounds) OR audible AND (release OR pop) OR joint AND (crack OR cracks OR cracking). Results where limited to English language. Results older than 20 years where not included.

Search outcome 82 articles where found, of which 7 were relevant.

Relevant papers

Author, date and country	Patient group	Study type	Outcomes	Key results	Study weaknesses
Méal GM & Scott RA, 1986, England	8 subjects that had their MCP joints "cracked" during the experiment.	Prospective design	Simultaneous recordings of sound and tension during a joint "crack".	The joint crack is a double sound wave, the separation of the joint surfaces starts between the two sounds. Researchers are of the opinion that a joint crack is an essential indi-cation that a diarthrodial joint has been taken into the paraphysiological zone, indicating separation of the articular surfaces (adjustment).	Researchers were unable to explain the full sequence of events responsible for the joint crack.
Herzog W et al., 1993, Canada	28 patients who had pain in the thoracic spine, all received spinal manipulative treatment of T4.	Prospective design	Instantaneous acceleration signals of T3 during SMT and the practitioners perception if cavitation had occurred.	Cavitation may be measured during SMT using accelerometry and a practitioner's perception of the occurrence of cavitation during SMT is very accurate (100% agreement in this study).	The method used to measure cavitation using accelerometry may not be accurate.
Brodeur R, 1995, USA	None	Literature review	The cavitation mechanism and process are discussed.	The sudden joint distraction during a manipulation occurs in a shorter time period than that required to complete the stretch reflexes of periarticular muscles, there is likely to be a high impulse acting on the ligaments and muscles associated with the joint. Without the cavitation it would be difficult to generate the forces in the appropriate tissues without causing muscular damage.	No statistical evidence.
Reggars JW, 1998, Australia	None	Literature review	Evidence for the therapeutic benefits of the audible release is discussed.	There is little scientific evidence to support any therapeutic benefit derived from the audible release. Available evidence tends to disagree with many of the alleged beneficial effects.	No statistical evidence, largely based on one scientific paper.
Evans DW, 2002, England	None	Literature review	Discussion of previous theories and research of spinal high-velocity, low-amplitude thrust manipulations.	Cavitation should not be an absolute requirement for the mechanical effects to occur but may be a reliable indicator for successful joint gapping.	No statistical evidence to support the benefits of a cavitation.
Protopapas MG & Cymet TC, 2002, USA	None	Literature review	An hypothesis about the articular release is given.	Articular release is a physiologic event that may or may not be audible. Not all noise that emanates from a joint signifies an articular release.	Researches could not find enough rigorous scientific research to determine the specific effects of articular release.
Flynn TW et al, 2003, USA	71 patients with nonradicular LBP, referred to physical therapy, all treated with spinal manipulative technique of the sacroiliac region.	Prospective cohort study	Reassessment 48 hours after manipulation for changes in range of motion, numeric pain rating scale, and modified Oswestry Disability Questionnaire score.	Audible pop in 50 of the 71 subjects. Both groups (with or without audible pop) improved, there were no differences between groups ($P > .05$). There is no relationship between an audible pop during sacroiliac region manipulation and improvement in ROM, pain, or disability in individuals with nonradicular LBP. The occurrence of a pop did not improve the odds of a dramatic improvement with manipulation treatment.	The experiment was performed in physical therapy clinics.

Comment

There is some evidence to suggest that a cavitation is required during an adjustment to achieve the forces in the appropriate periarticular tissues without causing muscular damage. It is suggested that a chiropractor can accurately detect a cavitation. However, during a manipulation it is impossible to be certain which joint underwent the cavitation process based solely on the sound. Therefore, the sound of an audible release does not necessarily indicate that the appropriate reflexes were stimulated.

Possibly the greatest therapeutic benefit of the audible release may not be physiological in nature but rather psychological. The joint crack may have a powerful placebo effect on both the patient and practitioner. It is not unreasonable to assume that the patient expects to hear a cracking sound during the treatment and interprets this sound as a sign of a successful adjustment. When the expectations of the patient are not fulfilled this may have a negative affect on the clinical outcome. If an audible release is achieved, especially with reinforcement from the practitioner, then a powerful placebo effect may be expected.

Clinical bottom line

There is no direct evidence for the physiological therapeutic benefit of the audible release associated with the chiropractic adjustment. Furthermore, repeating the adjustment shortly after the joint has cavitated without an audible release, aiming to "get an audible", may even cause damage as the joint is potentially stretched beyond its anatomical range of movement.

To conclude, an audible release may improve the outcome of a chiropractic adjustment, but therapeutic benefits of the audible release are likely to be psychological, and not physiological

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