

## Can Chiropractic Improve Hearing?

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In 1895, the first chiropractic adjustment reportedly helped restore a man's hearing; 111 years later, a case series may open the door to further investigation.

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While low back pain is the primary condition chiropractic care is associated with, its origins in the United States tell a different story. The first chiropractic adjustment, performed by D.D. Palmer in September 1895, was administered not to relieve back pain, but as an attempt to restore the hearing of Harvey Lillard, a janitor who worked in the building where Palmer maintained his office.

According to Palmer, Lillard explained that his hearing loss had occurred 17 years earlier, when he experienced a "pop" in his back while bending over. After examining Lillard's spine, Palmer discovered a "lump" between Lillard's shoulders, and theorized that the lump and Lillard's hearing loss were somehow related. "I reasoned that if that vertebra was replaced, the man's hearing should be restored," Palmer later wrote. "With this object in view, a half hour's talk persuaded Mr. Lillard to allow me to replace it. I racked it into position by using the spinous process as a lever, and soon the man could hear as before. There was nothing 'accidental' about this, as it was accomplished with an object in view, and the expected result was obtained. There was nothing 'crude' about this adjustment; it was specific so much so that no chiropractor has equaled it."<sup>1</sup>

With that one adjustment (and a similar adjustment performed on a person with heart trouble a short time later), the chiropractic profession was born. Within two years, D.D. would open the Palmer School and Cure, the first school of chiropractic in the United States. Within two decades, Kansas would become the first state in the country to enact a licensing law for doctors of chiropractic. And within 80 years, chiropractic would be legally practiced throughout the U.S and in more than a dozen countries.

Now, 111 years after D.D. performed the first chiropractic adjustment, a study published in the open-access journal *Chiropractic & Osteopathy* lends credence to some of his original claims about the effectiveness of chiropractic in treating a wide range of conditions.<sup>2</sup> While unable to establish a definitive relationship between chiropractic care and hearing loss, the study opens the door for larger trials to be conducted, and serves as a gentle reminder that chiropractic care has the potential to relieve more than just low back pain.

The case-series study examined the effect of a single chiropractic adjustment on the hearing of 15 patients between the ages of 34 and 71 who visited a chiropractic clinic in Italy. Interestingly, none of the patients complained of hearing problems when entering the clinic; most presented with a primary complaint of neck pain or low back pain. Upon entering, each patient was subjected to a series of audiometric screenings using a hand-held audioscope. During the screening, patients were asked to indicate whether they could hear four separate audio tones (500 hertz, 1,000 hertz, 2,000 hertz and 4,000 hertz) at three different fixed decibel levels (20 decibels, 25 decibels and 40 decibels) in each

ear.

After the first set of screenings, chiropractic adjustments were delivered based on examination and palpatory findings, which were used to determine areas of joint dysfunction. While no "specific" adjustment was performed to restore hearing, each patient received a high-velocity, low-amplitude thrust in the thoracic, lumbar spine and locomotor system, including the extremities. All patients were re-evaluated with another audiometric screening immediately after the first chiropractic adjustment, with two sets of criteria used to evaluate the effectiveness of the intervention.

Comparison of the audiometric screenings before and after the adjustment suggested that chiropractic had at least a limited effect on the patients' hearing.

In the patient group, the total number of tones heard on initial exam varied significantly from the right ear (55) to left ear (83). After receiving a chiropractic adjustment, the total number of tones heard improved in both ears. In the right ear, the number of tones heard nearly doubled (to 104), while in the left ear, the number of tones heard increased by more than 25 percent (to 111).

Using the Ventry & Weinstein criteria of hearing loss (missing one of four tones at 40 decibels in either ear), all of the patients were considered hearing impaired at baseline. Following the chiropractic intervention, 13 patients showed an improvement in hearing, including six patients whose hearing was restored; no patients worsened as a result of the adjustment. Using the speech-frequency criteria of hearing loss (missing one or more tone in either ear at 25 decibels), all of the patients again met the criteria for being hearing impaired at baseline. Based on the speech-frequency criteria, however, chiropractic was somewhat less successful in improving the patients' hearing; while 11 patients reported an improvement in hearing, none had their hearing completely restored, and three patients missed an additional tone during the re-evaluation.

Although chiropractic appeared to improve hearing in all subjects, the author of the trial was cautious in his assessment of the results:

"The current observational study cannot prove a cause-and-effect relationship," the author wrote. "The limitations to this current study are the small sample size and that there was no blinding of the investigator, though patients were blinded to the fact that hearing would be tested post-chiropractic care. Furthermore, no true control group or randomization of testing sequence was employed and potential alternative explanations as to the natural history of hearing loss may explain our results, for example some learning effect of the test."

The author theorized that mechanisms related to the auditory cortex and the vestibule-cochlear system might be affected by chiropractic adjustments, which could lead to changes or improvements in hearing. For example, it was noted that unilateral hearing loss is frequently found in people with vertigo, and that signals from the vestibular organs, the visual system and the somatic system are integrated through the vestibular nuclei. "Therefore," the author wrote, "it is possible that changes in the vestibulo-cochlear system of the brainstem brought about through afferent information of somatic structures affected by chiropractic adjustments may influence the integrity of acoustic processing and hearing."

"A percentage of patients seeking chiropractic care have a mild to moderate hearing loss, identified by audiometry," he concluded. "In accordance with other reports, the clinical progress documented here suggests chiropractic care may benefit hearing loss and that chiropractic adjustments to various areas

of the spinal column and locomotor system may have an effect on central auditory processing, though alternative explanations can not be disregarded." He added that the data observed in the case series "provide limited support to previous works indicating that, when hearing is tested immediately after a single chiropractic adjusting visit, hearing may be improved in both ears. Further research in this area is required, in the form of a well-designed randomized controlled trial."

Given the study's subject matter, *Dynamic Chiropractic* contacted Dr. Anthony L. Rosner, Director of Research and Education for the Foundation for Chiropractic Education and Research, for comment. In an e-mail to *DC*, Dr. Rosner stated that while such trials represent "an important stepping stone" to future research, the results should be interpreted "very cautiously."

"Although the lack of blinding and randomization reduces the internal validity of this work, cohort studies in and of themselves are an important stepping stone to randomized controlled trials and usually take place in the natural setting, making their external validity actually greater than an RCT," he wrote. In particular, Dr. Rosner was troubled by three of the study's aspects, including:

- the lack of any indication of precision of measurement;
- the lack of any indication of follow-up to determine how soon the measurements took place after the chiropractic adjustment was delivered;
- the lack of a more comprehensive description of the actual techniques and procedures performed.

"The background literature is provocative; however, most of the article seems to be grounded in speculation and theory," Dr. Rosner wrote. "In summary, I would not dismiss this article, but would interpret it very cautiously. There is no doubt that it points the way toward further useful, more definitive research."<sup>3</sup>

Along with hypertension and arthritis, hearing loss is one of the most prevalent conditions in the elderly. It is estimated that up to 40 percent of all adults 65 years or older suffer some degree of hearing impairment.<sup>4</sup> While the results of the *Chiropractic & Osteopathy* study are certainly less than conclusive, they do pave the way for larger studies to be conducted. If nothing else, the study helps to validate what the chiropractic profession has known for more than a century: that low back pain is only one of many conditions for which chiropractic may be effective.

## References

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JULY 2006