Evidence in Action: Cervical Disk Herniation

By Barbara A. Mansholt, DC

WHAT EVIDENCE EXISTS REGARDING AUDIBLE-RELEASE SMT AT A CONFIRMED CERVICAL DISK PROTRUSION SITE?

A 50-year-old male patient seeks care for neck and arm pain. Cervical orthopedic tests are negative except for localized pain. Sensory testing reveals no abnormal changes. Although he reports arm pain, you cannot pinpoint any specific dermatome levels. Muscle strength testing shows no weakness. He has a confirmed cervical disk protrusion at C5-C6 on an MRI from his medical physician. You've seen this presentation frequently in your practice and proceed routinely. You recommend a structured regimen of high-velocity, low-amplitude (HVLA) adjustments and home exercises. But because your skeptical patient's wife talked him into visiting your office, he needs research, reassurance and reasoning.

EVIDENCE-BASED CONSIDERATION: This era calls for evidence-informed clinical practice even though chiropractic expertise traditionally involves treating patients with neck and arm pain, with and without confirmed cervical disk protrusion.

How common is this condition *according to the literature*? The annual *incidence* (i.e., number of new cases per year) of cervical radiculopathy is 83 per 100,000 individuals, while the *prevalence* (the amount of cases in the population at/over a given time) is 3.5 per 1,000 individuals. Cervical disk protrusion occurs more commonly in patients ages 50 to 60. It demonstrates a variety of related physical findings. In less than one-fourth of cases, the intervertebral disk is the sole causative agent. More than half of such cases are caused by both discogenic and spondylotic issues.[1]

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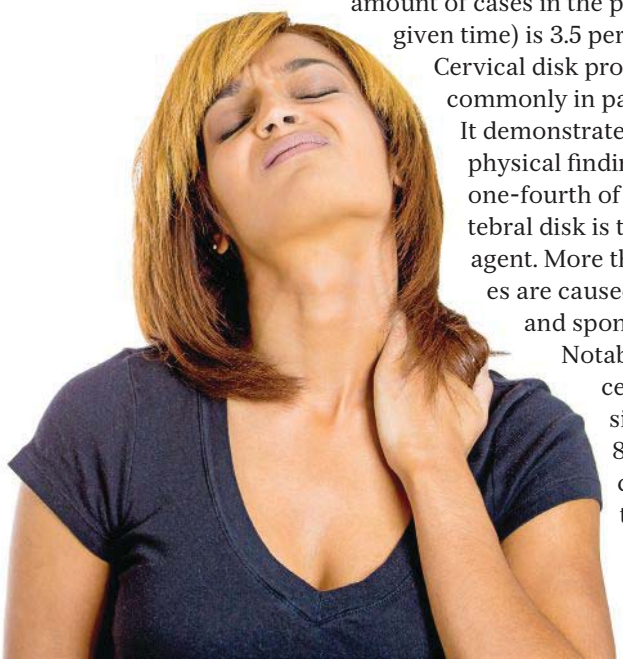

Notably, the prevalence of cervical disk protrusions ranges between 8 percent and 70 percent among asymptomatic individuals.[2,3] Inconclusive evidence exists to draw firm conclusions regarding spinal manipulative treatment (SMT).[4] Some consider it contraindicated, although many perform SMT at adjacent sites. The natural history appears favorable.[5]

However, here is a recent study:

Peterson C, Schmid C, Leeman S, Anklin B, and Humphreys BK. Outcomes from magnetic resonance imaging – confirmed symptomatic cervical disk protrusion patients treated with high-velocity, low-amplitude spinal manipulative therapy: a prospective cohort study with 3-month follow-up. *J Manipulative Physiol Ther* 2013;36(8):461-7.

OBJECTIVE: The authors asked, "How do patients with cervical disk protrusion and radiculopathy respond to osseous SMT?"

METHODS: Fifty patients were recruited from a Swiss chiropractic practice. Aged between 18 and 65, they had neck pain and moderate-to-severe arm pain in a dermatomal pattern; sensory, motor or reflex changes corresponding to the involved nerve root; and no contraindications to cervical SMT. At least one positive orthopedic test for radiculopathy was required. Exclusion criteria included spinal myelopathy, spinal stenosis and previous spinal surgery. Outcome measures included the Numeric Rating Scale (0-10), the Neck Disability Index (NDI) and the patients' global impressions of change (PGIC). Patients were assessed at two weeks, one month and three months. Treatment occurred three to fives times per week for two to four weeks, and then one to three times per week until the patient was asymptomatic. Patients were allowed OTC pain medications.

OF NOTE: SMT was performed "*at the spinal level clinically assessed to correspond with the MRI findings*." HVLA was applied "with the goal of moving the affected segment and producing an audible release." If audible release was not achieved during the first thrust, the DC could try twice more.

RESULTS: Fifty patients provided data at baseline and three months. The average patient was 44 years old. About a third were male. After the initial two weeks of treatment, 55.3 percent were significantly improved. None reported being worse. The percentage of improved patients continually rose during treatment. One patient was slightly worse at one month but reported improvement after

three months. Statistically and clinically significant reductions in NRS and NDI scores occurred throughout the study. Specifically, patients' PGIC were as follows: At week two, 55.3 percent were much better or better; at one month, 68.9 percent were much better or better (2.2 percent slightly worse); at three months, 85.7 percent were much better or better. Regarding functional outcomes of the numerical rating scale for neck pain (NRS) (0-10), the average baseline was 5.71 (SD, 2.98); week two, 3.54 (SD, 2.17), one month, 2.58 (SD, 1.97) and three months, 1.68 (SD, 1.72). Regarding NRS for arm pain, the average baseline was 6.43 (SD, 2.77); week two, 4.12 (SD, 2.58), one month, 2.71 (SD, 2.19) and three months, 1.64 (SD, 1.84). Baseline neck disability index (NDI) was 18.17 (SD, 8.71); week two, 14.12 (SD, 8.52), one month, 9.15 (SD, 5.15) and three months, 4.95 (SD, 4.29). These outcome data were reported statistically significant $p<0.0001$.

The authors also divided the patients into groups of acute and chronic (> 4 weeks duration). Not surprisingly, acute patients saw a faster and further decline in NDI, NRS and PGIC scores (86 percent improved at three months vs. 76 percent for chronic CDH patients). It should be noted that the chronic group's improvement was still statistically/clinically significant.

STUDY CONCLUSION: SMT for acute, subacute and chronic patients with CDH in this study produced significant improvement in symptoms with no adverse effects.[6]

For DCs

Most DCs use a 0-10 pain rating scale (0 represents no pain, while 10 signifies the worst pain ever). Although various labels are used to refer to this scale, it is technically the numeric rating scale (NRS). So the average NRS score for neck pain was 5.71 (SD, 2.98) at baseline. What about the SD (standard deviation)? The NRS score of 5.71 is an average of all 50 patients. The SD magnitude gives us more information about the distribution of those scores. *Simply stated, the higher the SD, the more variable the baseline score among all patients (above and below the average/mean); the lower the SD, the more similar or more precise.* In this case, baseline NRS scores ranged from below 3 to almost 9, averaging 5.71 (SD, 2.98), whereas NRS scores after three months at 1.68 (SD, 1.72) ranged from 0 to slightly over 3.

The NDI score comes from a validated instrument. Patients answer questions regarding function and pain; the score is out of 50. Baseline NDI mean (average) was 18.17 (SD, 8.71); after three months, NDI was 4.95 (SD, 4.29). Here, the baseline NDI SD shows a moderate amount of variability among patient responses. The three-month NDI SD shows high variability.

This study has limitations. It was not a randomized controlled clinical trial. We cannot assume that SMT was the only factor leading to improvement. It's an observational study, and the sample size is small. Patients with spinal stenosis and cervical spondylotic myelopathy were excluded (among others), because those conditions would potentially lessen the improvements.

We can inform our patient that his condition is common and has been studied for decades. The prognosis (with or without treatment) is poorly understood, although patients with similar MRI findings frequently have no symptoms. Practitioners should be aware that MRI findings may or may not indicate the cause of the symptoms. We can suggest that a recent small study found marked improvement in more than 50 percent of patients after two weeks, while more than 85 percent showed improvements after three months, and none experienced adverse reactions.

This scenario represents only the interpretation of research evidence. Our evidence-informed clinical practice recommendation also incorporates clinical experience and patient preference and circumstances. ■

Glossary

Incidence: number of new cases of a disease/condition occurring during a specified period.

Prevalence: number of affected persons in the population at a specific time divided by the number of persons in the population.

Standard Deviation: summary of how widely dispersed the values are around a mean.

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