



Dynamic Chiropractic – December 14, 2000, Vol. 18, Issue 26

Back Pain Literature: What Have We Learned?

By William F. Brady

Knowledge is the foundation of clinical success. In health care, this knowledge is shared through professional literature published and critiqued by our peers. This is done in an effort to determine what information is most accurate and balanced. Any idea that has been exposed to intelligent critique, then validated or modified, is improved. It is this improved information that should be guiding our clinical decisions.

What does the literature tell us about back pain? A lot! As practitioners, we need to be aware of the literature and let it guide our decision-making.

Two years ago, an article in the *New England Journal of Medicine*¹ contained a comparison of physical therapy, chiropractic manipulation, and provision of an educational booklet for the treatment of patients with low back pain. It fueled a lively debate regarding effective treatments for low back pain. In this study, Cherkin, et al.¹ found that there was little difference in outcomes between low-back-pain patients treated with chiropractic manipulation, McKenzie exercises, or provision of an educational booklet.

Chiropractic researchers were immediately upset by these results and responded by questioning the study design and the significance of the results.² This begs the question, "Do you hold the information you use in support of chiropractic manipulation to the same standards?" Despite the potential flaws in this research, I feel we can benefit by examining the information that Cherkin, et al. have provided.

Other studies have yielded mixed results with regards to the efficacy of manipulation in low back pain patients. Carey, et al.³ showed no difference in recurrence rates for low back pain patients treated by chiropractors, orthopedic surgeons, and primary care physicians. Godfrey, et al.⁴ reported no statistically significant difference in outcomes between control and manipulation groups in recent-onset low back pain patients. Meanwhile, Meade, et al.⁵ reported that "chiropractic almost certainly confers worthwhile, long-term benefits in comparison with hospital outpatient management. The benefit is seen mainly in those

with chronic or severe (low back) pain." An overall review of the available information on the relationship between manipulation and low back pain suggests that acute and chronic pain can benefit from manipulation.⁶ This is partly reflected in the AHCPR guidelines, as they recommend manipulation for adults with acute low back pain.⁷

Why the mixed results in many cases? It is likely that we are not being specific enough with our diagnoses. The most consistent flaw in treatment of low back pain is fairly straightforward: we are treating low back pain as though it were a single entity with only one cause. This seemingly homogenous group of low-back-pain patients has many different subgroups, yet the tradition in back pain treatment is to apply a therapy based on our training and not on the patient's specific condition. We tend to spend far too much time asking what treatment is best, and not enough time determining exactly what is wrong with each patient. This is evident with diagnoses such as "nonspecific back pain," "mechanical back pain," "idiopathic back pain" and "lumbago"; these diagnoses are not specific and are of little value.

The question then arises: Can we separate patients with low back pain into diagnostic subgroups? Cherkin, et al.¹ report: "Ideally, there would be some way of identifying the subgroups that are most likely to benefit from one or both of these therapies, though we were unable to identify any predictive characteristics." However, they do not mention what attempt was made to examine any predictive characteristics. While it can be difficult to place low back pain patients into diagnostic subgroups, there is a body of evidence that suggests it can be done reasonably well, and in the office setting.

Let's now examine what structures are commonly responsible for low back pain and what role manipulation and McKenzie exercises may play in treatment of these structures.

It has been convincingly demonstrated that approximately 70 percent of low back pain arises from three sources:⁸

Pain Generator - Approximate Percentage:

- Internal Disc Disruption - 39%⁹
- Zygapophyseal Joint - 15%¹⁰
- Sacroiliac Joint - 13%¹¹

It is unlikely a single therapy will effectively treat all three of these dysfunctional structures. The question to logically follow is how to differentiate among these three pain generators.

After ruling out serious pathology, diagnosis of the pain generator represents the first step in maximizing our clinical outcomes. We must also address why the pain generator is painful. This consists of addressing a multitude of dysfunctions and perpetuating factors, a discussion outside the scope of this article. For a detailed look at this clinical thought process, see Donald Murphy's *Conservative Management of Cervical Spine Syndromes*,¹² and Craig Liebenson's *Rehabilitation of the Spine*.¹³

The first step in identifying the above-listed pain generators is the McKenzie assessment. Repetitive end-range movements are performed, and any change in the patient's report of pain is noted; specifically if the pain centralizes, peripheralizes, or if there is no change. Donelson, et al.¹⁴ reported that when the patient reports centralization of pain during the McKenzie assessment, there is a large chance that the pain is discogenic with an intact annulus, and if the patient reports peripheralization of the pain, there is a smaller chance that the pain is discogenic, but with an incompetent annulus. Patients whose pain remains unchanged were shown to have negative discograms, and therefore a small chance of symptomatic disc pathology.

This assessment has been shown to have a .94 sensitivity and .82 specificity for diagnosing discogenic pain, and a 1.00 sensitivity and .86 specificity for diagnosing incompetent annulus.¹⁵ Compared with the nine physical examination procedures published in the AHCPR guidelines,⁷ the McKenzie assessment exceeded all other tests regarding sensitivity, and was fourth regarding specificity.

Patients who respond to McKenzie examination can reasonably be placed into a discogenic pain subgroup, and treatment can begin, including the McKenzie protocol. Under these conditions, this treatment is theorized to decompress the disc, encouraging the nucleus to migrate toward the center, allowing the annulus to heal. High-velocity, low-amplitude (HVLA) manipulation in a patient with discogenic pain will likely produce only an analgesic effect, and is unlikely to significantly effect disc pathology. However, if joint dysfunction is concurrently present, manipulation would be indicated. It is a strong possibility that this relatively large patient population is responsible for some of the long-term failures when treated solely with manipulation. Another significant factor with these patients is the need to avoid postures that peripheralize their pain; without this advice, the McKenzie exercises are less likely to be successful.

The next step would be to determine if the zygapophyseal joints are pain generators. This is best determined by invasive joint block procedures. However, a small study by Jull, et al.¹⁶ showed a 100-percent correlation between palpation and joint blocks for determining symptomatic cervical zygapophyseal joints. This suggests that skilled palpation can be as reliable as joint blocks. Hides, et al.¹⁷ found a strong

correlation (chi square, $P= 0.932$) between unilateral multifidus muscle wasting and restricted/painful zygapophyseal joints to palpation in low back pain patients, demonstrating that palpation can be a reliable assessment for identifying dysfunction. It appears clinically reasonable to place patients who have a reproduction of pain upon joint challenge into the symptomatic zygapophyseal joint subgroup.

The final pain generator on our list is the sacroiliac (SI) joint. Again, identification of the sacroiliac joint as a pain generator is best performed by invasive joint block. Many studies have shown that clinical SI joint tests are not valid or reliable, although most of these studies have very strict criteria. Broadhurst, et al.¹⁸ reported 100 percent specificity for the FABER, posterior shear and resisted abduction pain provocation tests and 77, 80, and 87-percent sensitivity, respectively. This was based on a 70-percent pain reduction with SI joint injection. In support of these findings, many authors have reported much success with varying diagnostic and treatment procedures involving the SI joint.¹⁹⁻²¹ Clinically, it seems reasonable to perform these pain provocation tests and, if positive, classify these patients into the SI pain subgroup.

It also appears reasonable to assume that in many cases, pain arising from the zygapophyseal and SI joints is due to joint restriction, and would, therefore, respond favorably to manipulation. The most widely accepted theory to explain the presence of joint restriction is meniscoid entrapment, as reasoned by Karel Lewit.²¹ Other situations that are not amenable to manipulation could certainly cause a joint to produce pain, but these are also less likely to produce restriction and are probably less common. What is clear is that HLVA manipulation should only be applied after skilled clinical examination and identification of restricted joint mobility.

The above three pain generators have been used as examples, because they account for a large portion of back pain, and have a gold standard for assessment. In other words, they are common, proven pain generators. It's also necessary to mention what is responsible for the other 30% of back pain. Travell²⁰ makes a strong case for trigger points causing back pain. Leahy²² and Cyriax²³ make a strong case for soft tissue adhesion causing back pain. Soft tissue diagnosis and treatment is in its early stages of development. Although some scientists are uncomfortable with the concept of soft tissue pain, as clinicians, we can ill afford to ignore its presence. It appears likely that a significant portion of the other 30% percent of back pain arises from various forms of soft tissue injury and dysfunction.

In the Cherkin, et al. study, chiropractors diagnosed a sprain or strain in half of the patients, and facet syndrome in 30 percent. The physical therapists diagnosed a derangement 92 percent of the time. It is highly

unlikely that the randomly assigned patients actually had a significant difference in their conditions, as the assigned diagnoses suggest. Furthermore, these diagnoses are inconsistent with the expected percentages provided by the literature. This suggests that the practitioners made their diagnoses with preconceived treatment in mind. This is a significant error: In order for a diagnosis to be meaningful, it must be specific and accurate. This is an essential step in the patient care process, as the selection of efficacious treatment is predicated upon an accurate and complete diagnosis. It can be suggested that the Cherkin, et al. study produced poor outcomes because of the absence of a specific diagnosis, resulting in the random application of treatment.

If I were to ask you which method of treatment is better - chiropractic manipulation, McKenzie exercises, or an educational booklet - would you answer the question before asking for what specific condition they were used? If your answer is "yes," you have fallen prey to the same thought process.

By analogy, if I were to ask you which was better - a knife, fork or spoon - you would say it depends on what food I was eating. One tool may be better for the majority of dishes, if we were forced to use just one, but we don't have to do that (unless we only know how to use one). The knife, fork, and spoon have specific jobs, and they work well when properly applied. They also work harmoniously when one effectively eat a multiple-course meal. This is no different than chiropractic manipulation, McKenzie exercises and an educational booklet. Properly applied, they are very effective tools, but used exclusively or randomly applied, they are weak and feeble, as Cherkin et al. have displayed.

The human body is made up of complex systems. Various parts work in concert, each playing a role. It is common that dysfunction in one area will produce dysfunction and symptoms in another area. This will potentially require multiple therapies applied concurrently or sequentially. For example, it has been shown that low-back-pain patients significantly benefit from a combination of manipulation and specific spinal stabilization exercises over manipulation alone.²⁴

It is challenging for the practitioner and student to integrate multiple therapies. The primary reason for this is that the various procedures available to the spinal specialist are not taught as integrated therapies. The procedures are only learned at technique-specific classes or seminars. Students end up having to stitch together the pieces themselves. Unfortunately, teaching in chiropractic schools is all-too-often done in blocks that never get integrated. There lies a great chasm between what a student learns in orthopedics and the treatments learned in technique class. Correcting this disparity will be the fastest way to getting better

patient care and improving the professions standing in the health care arena. This is a time-sensitive issue. The profession most willing to question long-held assumptions, produce quality research, and be guided by the literature will reap the greatest benefits.

It is time we research subsets of patients with back pain, to determine the effect of specific treatments in patients with specific diagnoses. We must shift our paradigm from "treatment-based" to "diagnostic-based." I can conceive of no other way. For example, I think it would be absurd to perform an appendectomy on every patient with abdominal pain. It is likewise foolish to apply manipulation or McKenzie exercises in every patient with back pain.

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William F. Brady, DC

Rhode Island Spine Center

wbradydc@hotmail.com



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