Musculoskeletal Monthly

An evidence-based newsletter related to the management of musculoskeletal disorders

Spinal manipulation for low back pain: Which patients benefit the most?

In last month's newsletter, we discussed why there was a lack of consensus regarding the management of back pain in primary care and the determination of which treatments, if any, are most effective. It is clear to many that the "one size fits all" approach to treating low back pain and related clinical research of the topic has resulted in conflicting evidence regarding the effectiveness of treatments for low back pain.

Until researchers and clinicians reject the notion that a beneficial panacea exists for all patients with low back pain, we will continue to read published studies that add little to our body of knowledge and utilize interventions that may not be any more effective than the passage of time. This is because interventions applied to heterogeneous groups of patients with little in common other than a nominal diagnosis of "mechanical back pain" are usually doomed to fail from the outset.[1] Therefore, it's imperative from a research (and common sense) perspective to match the right treatment to the right patient.[2]

Spinal manipulation is a commonly used intervention to treat low back pain that may result in dramatic relief in some patients,[3, 4] while others appear to experience little benefit.[5] Although there are wide variation in national clinical practice guidelines recommendations across the world with regard to the efficacy and utilization of manipulation in the treatment of LBP,[6, 7] more recent evidence using a classification approach has clarified the magnitude of this effect and how to identify which patients may benefit most from it.[2-4]

Researchers have reported on the development of a clinical prediction rule for identifying patients with low back pain likely to benefit from manipulation (see Figure). They examined a series of patients, each of whom received a manipulation intervention. Five factors formed the most parsimonious set of predictors for identifying patients who achieved at least a 50% improvement in disability within one week with a maximum of two manipulation interventions.[4]

Criterion		Definition of positive
1.	Duration of current episode of low back pain	< 16 days
2.	Extent of distal symptoms	Not having symptoms distal to the knee
3.	FABQW subscale score	< 19 points
4.	Segmental mobility testing	At least one hypomobile segment in the lumbar spine
5.	Hip internal rotation range of motion	At least one hip with > 35° of internal rotation range of motion

Table: Clinical Examination Criterion for Patients Highly Likely to Benefit from Manipulation

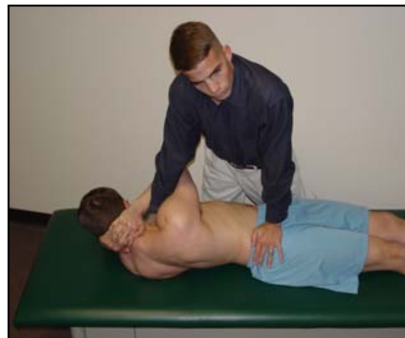

Figure 1. Lumbopelvic manipulation technique

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We recently validated the spinal manipulation clinical prediction rule in a multicenter randomized clinical trial performed in physical therapy clinics across the country, the results of which were recently published in the *Annals of Internal Medicine*.[3] The study examined 131 patients with low back pain, 18 to 60 years of age, who were referred to care provided by physical therapists. Patients were randomly assigned to receive physical therapy that included two sessions of high-velocity thrust spinal manipulation plus an exercise program (manipulation + exercise group) or an exercise program without spinal manipulation (exercise only group). During the first two sessions, patients in the manipulation + exercise group received high-velocity thrust spinal manipulation and a range-of-motion exercise only. Patients in the exercise group (and patients in the manipulation group after the first two sessions of high-velocity thrust manipulation) were treated with a low-stress aerobic and lumbar spine-strengthening program. Patients in both groups attended physical therapy twice during the first week and then once a week for the remaining next 3 weeks, for a total of five sessions. To view an online instructional video on the prediction rule, click on the figure below or visit our website under the Our Services, Spine Care section.

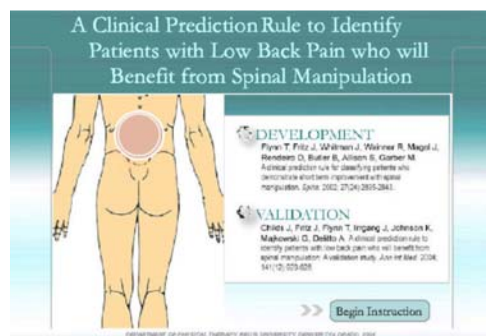

Figure 2: Spinal Manipulation Clinical Prediction Rule

Among patients who were positive on the rule, dramatic improvements in pain and disability were observed after 1 and 4 weeks of treatment among patients receiving physical therapy that included spinal manipulation and exercise compared with patients receiving an exercise program only . Based on a pre-test probability of success of 44%, and a positive likelihood ratio of 13.2, a patient who is positive on the rule and treated with manipulation has a 92% chance of achieving a successful outcome by the end of one week.[8]

The potential impact of the rule on decision-making is also highlighted by the number needed to treat (NNT) statistics. For patients who were positive on the rule, the NNT with manipulation at one week was 1.3, and at four weeks was 1.9. The NNT suggests that only about 2 patients who are positive on the rule need to be treated with manipulation to prevent one patient from failing to achieve a successful outcome after one or four weeks of treatment. Given the low level of risk related to manipulation of the lumbar spine, a shift of this magnitude clearly seems to warrant an attempt at spinal manipulation in patients who test positive on the rule.[9]

Although the results experienced by patients who were appropriately matched with manipulation and exercise are impressive, does it really matter in the long run? Doesn't most low back pain getter better with time anyway? The first question was answered by this study as well. At the 6-month follow-up patients who did not receive spinal manipulation demonstrated a statistically significantly greater use of *medication*, *health care utilization*, and *lost time from work* due to back pain than did patients in the manipulation group. A patient's status on the rule was not predictive of outcome in the exercise only intervention, supporting the notion that the rule is specifically predicting a response by patients for whom manipulation is both indicated and then received.

The notion that the majority of patients with low back pain improve regardless of what is done appears to be a myth. Many patients suffering from low back pain continue to experience significant pain and disability and simply quit seeking care or seek care elsewhere.[10] Unfortunately, patients with chronic, disabling low back pain account for a disproportionate share of health care expenditures and workers compensation costs.[11] Patients with early access to physical therapy tend to return to work sooner than when referral is delayed.[12] Our findings also emphasize the need for early access to physical therapy intervention in the rehabilitation of patients with low back pain, in particular for patients who are positive on the rule. Treatment of acute LBP with manipulation and exercise is now endorsed by the UK National Health Service as a cost-effective measure over a stepped-care or wait-and-see approach[13, 14]

A secondary analysis resulted in 2 two highly predictive pragmatic criteria that can be easily and quickly assessed in a busy Primary Care practice setting (duration of symptoms (<16 days) and distribution of symptoms). The positive likelihood ratio among patients meeting both of these criteria was 7.2. Based on a pre-test probability of success of 45%, this positive likelihood ratio would indicate an increase in the probability of success with manipulation to 86%,[15] still sufficiently high to warrant early referral to physical therapy.

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