A Case of a Potential Manipulation Responder Whose Back Pain Resolved with Flexion Exercises

Stephen May, MSc,[a] and Richard Rosedale, PT, Dip MDT[b]

Abstract

Objective: Researchers have begun to investigate the value of subgrouping patients with back pain to improve clinical outcomes; one method is the development of clinical prediction rules. To be of clinical value, it is important that subgroups identify distinct categories of patients with an associated optimal treatment. This case study raises the suggestion that subgroups identified in this way may not represent distinct categories.

Clinical Features: A patient with sudden-onset back pain, who had 4 of 5 criteria for a clinical prediction rule said to identify responders to manipulation, was successfully treated using repeated flexion in lying exercises.

Outcomes: Pain numeric score and Roland-Morris Disability Questionnaire were used to measure changes in pain and function. Pain score changed from 9/10 to 0/10 and disability score from 19/24 to 0/24 after 1 week and at 1 and 6 months of follow-up.

Conclusion: We have presented a case study that was positive for 4 of 5 items of the clinical prediction rule for manipulation responders, but this patient was successfully treated with flexion exercises. The clinical prediction rule may not represent a discrete subgroup but may include patients who can be effectively managed in other ways. (J Manipulative Physiol Ther 2007;30:539-542)

Key Indexing Terms: *Back Pain; Manipulation; Spinal; Exercise Therapy*

It has been proposed that the reason for the limited effectiveness demonstrated to date by intervention studies for low back pain has been the failure to identify subgroups most likely to respond to particular interventions.[1,2] Not surprisingly, there has been continuing interest in determining how best to classify patients with back pain and, furthermore, to determine if classification results in better treatment outcomes.[3-8] One research group has developed and tested clinical prediction rules (CPRs) based on minimal clinical characteristics, which are purported to define those patients most likely to respond to manipulation[3,4,9-11] or stabilization exercises[3,7] as opposed to another plan of intervention. In addition to the manipulation and stabilization exercises subgroups, there is also a subgroup within this system for specific exercises.[3,12] A CPR has not been developed for this group who respond to direction-specific or directional preference (DP) exercises, but it comprises those patients who demonstrate centralization of symptoms in response to repeated movements during evaluation. The DP exercise group is composed of patients who demonstrate centralization, abolition, or decrease in symptoms or increase in range of movement in response to specific repeated movements during evaluation.[8] Centralization is the lasting abolition of distal symptoms or back pain in response to repeated movements.[13]

The CPR for responders to manipulation has the following clinical characteristics: duration of current episode of back pain of less than 16 days; no symptoms distal to the knee; Fear-Avoidance Beliefs Questionnaire work subscale score of less than 19 points; at least 1 segment of lumbar spine classified as hypomobile; at least 1 hip with more than 35° of medial rotation.[5] The intention of this CPR is to aid clinicians in deciding which individual patients should receive manipulation. Further work produced a slimmed down version of the CPR, which only contained the items of duration and minimal referred pain.[9,10,11] Although it has been directly stated that CPRs are not meant to replace clinical judgement and should be used to complement clinical reasoning,[13] it may also be argued that the use of CPRs minimizes the clinical reasoning process, reducing decision making to a "tick-box" activity to bypass more complex and high-level reasoning that is often required in clinical practice.

The value of any subgroup is its need for a specific and hopefully optimal treatment; so, to be of clinical utility, they should represent distinct and nonoverlapping categories. George et al[12] claimed that there will be "zero possibility" of centralization in the categories other than the DP subgroup, such as the manipulation subgroup. However, if there was a degree of overlap between the manipulation subgroup and

[a] Senior Lecturer in Physiotherapy, Faculty of Health and Wellbeing, Sheffield Hallam University, Sheffield, United Kingdom.
[b] Physiotherapist, London Health Sciences Centre, London, Ontario, Canada.
Submit requests for reprints to: Stephen May, MSc, Faculty of Health and Wellbeing, Sheffield Hallam University, Collegiate Campus, S10 2BP Sheffield, United Kingdom
(e-mail: *s.may@shu.ac.uk*).
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the DP group, then the CPR may not be so useful at identifying patients who will respond optimally to manipulation. Although such patients may respond to manipulation, they may equally respond to DP exercises; so, evaluation for DP responses may be as important as the CPR criteria. To illustrate this point, we would like to present the following case study.

Case Report

Informed consent was obtained from the patient to publish her case in a medical journal, and anonymity was maintained. The patient, a 40-year-old woman, worked in administration and thus spent most of her time sitting. During her leisure time, she spent more time standing and walking than sitting. She presented with a 1-day history of asymmetric back pain, extending to her buttock crease on her left, and low lumbar pain on her right. She described the onset as occurring during performance of the "bow" in yoga, which is active extension from prone lying. Severity and functional disability was high, but fear avoidance was moderate or low. On a numeric pain scale, she rated her pain as 9/10. She scored 19/24 on the Roland-Morris Disability Questionnaire,[14] 14/24 on the Fear-Avoidance Beliefs Questionnaire—physical activity subscale, and 0/42 on the Fear-Avoidance Beliefs Questionnaire—work subscale.[15] At the time of her evaluation, she was only able to sit for 2 to 3 minutes. She was not absent from work but minimized sitting time and adapted her normal tasks. She noted the pain was constant except when lying down. The pain was worse when attempting bending, when sitting, when rising from sitting, and when still. The pain improved when she was standing, lying down, or being on the move. Walking and time of day did not influence her symptoms.

The patient reported only 1 previous episode of back pain 7 years before, which had resolved within a month without recurrence until the previous day. She had received no treatment and was in good health apart from the back pain. She was taking a muscle relaxer and nonsteroidal anti-inflammatory medication for the back pain, with little effect.

The patient's sitting posture was good, with a well-maintained lordosis. A neurologic examination was not deemed necessary because she had only back pain. On examination of her range of movement, it was estimated that there was a major loss of flexion, a moderate loss of extension, and minor losses of left and right side gliding. There was back pain with all single movements, and as she went into forward flexion there was no loss of lordosis. Her hip range of medial rotation was 72° left and 70° right. She was then examined using repeated movements. With repeated extension in standing, there was an increase in her baseline pain, which was worse afterward but had no effect on range of movement. Repeated extension in lying also produced her symptoms, which remained worse afterward and caused a dramatic decrease in lumbar flexion range of movement. In supine lying, she had no symptoms at rest; flexion from supine lying reproduced her back pain. This exercise was repeated with increasing patient overpressure from her hands around her knees. It got easier with repetition and eventually became pain free, and afterward her flexion range was fully restored. Only 1 set of 10 to 15 repetitions was performed. As a mechanically determined DP had been demonstrated with the response to repeated movements, no further examination was deemed necessary.

According to mechanical diagnosis and therapy classifications of McKenzie and May,[16] the patient was categorized as having a derangement, with a DP for flexion exercises. A derangement is characterized by the following findings: in response to repeated movements, pain is centralized, abolished, or decreased with the change in pain location, or decrease or abolition of pain maintained and accompanied or preceded by improvements in the mechanical presentation (range of movement and/or deformity).[16] A DP for flexion exercises describes a patient who is responding in one of these ways to self-mobilization flexion exercises. The patient was advised to repeat 10 flexion exercises while in the supine lying position every 1 to 2 hours, to maintain a neutral posture when sitting and standing, and to avoid positions of extension. For these exercises, from a crook lying posture she would bring her knees to her chest and then apply overpressure with her arms around her knees, with more overpressure applied with each repetition.

The patient returned for review 4 days later; she reported compliance with the exercises. She said she was in much less pain and was moving better. When asked, "[O]n a scale from 0 to 100%, if you had 100% of pain on your initial visit what would it be now?" Daphne answered "15%." On examination, there was no loss of flexion or extension movement, and during flexion there was a full reversal of the lordosis. With repeated flexion in lying movements, there was no untoward or negative effect, with no reproduction of her symptoms. It was felt that the classification and management strategy were confirmed. She was advised to reduce the frequency of exercise repetition and to do flexion in standing exercises in addition to flexion in lying.

Daphne was reviewed 2 days later. She stated that she was virtually pain free, only experiencing an occasional transient twinge, and was fully functional again. On examination all movements were full range, and none produced her symptoms. She was discharged with advice to maintain a balance between flexion and extension activities, to resume all previous activities, and to change her sitting posture regularly.

At 1-month follow-up, she reported 0/10 on the numeric scale and 0/24 on Roland-Morris Disability Questionnaire. She had resumed all her normal activities, including yoga. She was reviewed at 6 months and again reported 0/10 on the numeric scale and 0/24 on Roland-Morris Disability Questionnaire. Occasionally, over these 6 months, she had experienced a minor episode of pain when doing something "wrong," such as a movement with

too much extension, but she had been able to completely abolish symptoms independently with "a few" repeated flexion in lying exercises.

Discussion

A patient with recent onset of severe back pain associated with high disability responded rapidly to flexion DP exercises. High initial pain severity, functional disability, and restrictions in spinal mobility have been associated with poor long-term outcome.[17-19] Thus, the existence of DP may be another significant factor that directs the clinician's treatment despite the presence of otherwise poor prognostic factors or, as in this case, the presence of CPR criteria, which may point toward manipulation as a "most likely" treatment option.

The patient presented had 4 of 5 of the clinical items included in the CPR[5] and both items from the revised version.[11] Symptom duration and range of hip rotation had the highest positive likelihood ratios.[5] The presence of 4 or more of these 5 items was said to raise the chance of success with manipulation from 45% to 95%.[5] According to the slimmed down criteria in the presence of the 2 items, treatment success with manipulation was said to be 85%.[11] In this case study, however, this patient received self-management flexion exercises, which not only resolved her symptoms but also helped her to deal with a few brief recurrences. If this patient had been treated with manipulation by itself, as she appeared to fit the CPR criteria, this management may have failed to provide the patient with her own ability to control and abolish her symptoms when they returned.

Obviously, we cannot exclude the possibility that the patient would have responded equally or even better to manipulation nor that additional independent exercises may have been prescribed in addition to manipulation. Her response to DP flexion exercises does not equate to a failure of the manipulation CPR; however, treatment using DP exercises was clearly an alternative option that had the additional benefit of allowing the patient to take control of her symptoms and self-manage a future episode. It may be suggested that the clinically based symptom and mechanical responses are perhaps as useful determinants of management strategies than a set of clinical criteria selected by statistical analysis.

It should be recognized that the patient had very brief symptom duration of 1 day only, whereas the CPR criteria stipulated back pain of less than 16 days. Thus, limitations in the comparability of case study and CPR criteria should be recognized. Furthermore, given the short-term nature of the patient's symptoms, the positive prognosis of short-duration back pain should also be born in mind. Although the DP exercises appeared to work, and manipulation may also have worked, the pain may have spontaneously resolved given its short-term nature.

One case study is clearly not enough to overthrow a carefully constructed CPR that has attained level 2 status[13] on the levels of validation for CPRs of McGinn et al.[17] However, doubts about certain methodological aspects of its development may be raised. It is recommended that reliability for examination procedures used in CPR attain κ values of greater than 0.60,[20] whereas most of the items in this rule did not. Furthermore, it is recommended[20] that at least 10 cases are included for analysis for each variable entered into the initial assessment of variables. In the development of this CPR, 50 variables were included for initial analysis with 71 patients, which was narrowed to 11 variables after univariate regression; but even this final model used limited cases for the number of variables being considered.[5] Failure to provide sufficient cases in the development of a CPR can produce an unstable or biased model; and for this and reasons about different patient and therapist samples, CPRs have been recognized for not performing well when applied to new populations and settings.[20] This is why once a CPR has been derived in one population it must be validated in a different patient population with different clinicians. The manipulation CPR has been so validated,[9] but both derivation and validation studies were performed by specially trained clinicians on US military personnel in military facilities, and the applicability of the results to other patient groups and clinicians is unknown.[13]

The case study thus raises the possibility that patients who fit a CPR for manipulation may also fit a DP response; thus, the subgroups may not be discrete entities. However, a head-to-head comparison would be needed to determine which cluster of clinical findings was most powerful. For instance, a group of patients in whom both the CPR criteria and centralization or mechanically determined DP was elicited could be randomized to receive either manipulation or DP exercises to determine which is more effective.

Conclusion

In conclusion, we have presented a case study that was positive for 4 of 5 items of the CPR for manipulation responders.[5] This patient was treated with DP flexion exercises, regaining full painless function that was maintained over at least a 6-month follow-up period. The CPR may not represent a discrete subgroup but may include patients who can be effectively managed in other ways.

Practical Applications

- A CPR has been developed to identify patients most likely to respond to manipulation.
- We describe a patient with 4 of 5 of these clinical characteristics who responded to flexion DP exercises after a McKenzie evaluation.
- This case study provides an example of how patients who fit CPRs may actually respond to alternate treatment.

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