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Research Paper Review

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Review Title: Clinical Decision Rule for Patients with Acute LBP at Risk of Developing Chronic Pain

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Study Title:
Clinical decision rule for primary care patient with acute low back pain at risk of developing chronic pain

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Background Information:
Acute low back pain (LBP) resolves within 6 to 8 weeks in most cases. However, some patients develop chronic pain that can lead to considerable suffering. This group of patients is notoriously difficult to treat and account for most LBP-related health expenses.

Attempts have been made to develop clinical decision rules (CDRs) which could be used to identify risk factors that are associated with an elevated likelihood of developing chronic LBP. Examples of risk factor screening tools include the STarT-Back (1, 2) and the Chronic Pain Risk Screener (3). However, these instruments were not specifically designed to assess acute LBP patients.

The purpose of the current study was to develop a screening tool that is specific to the prognosis of patients with acute LBP. This was a prospective cohort study designed to evaluate the prognosis of patients with well-defined acute LBP and to identify early risk factors that can be used to decide on a more accurate prognosis.

Pertinent Results:

- There were 605 participants in this study, with 521 (86%) responding at 6 months and 443 (73%) at the 2-year follow-up.
- Patients' mean pain levels were considered to be intense, on an 11-point NRS averaging 5.6 ± 1.8 in the past week, and ranging from 2.6 ± 1.8 when most

tolerable to 8.6 ± 1.4 when worst. The level of bothersomeness was 6.5 ± 2.3 and Roland-Morris score for disability was 15.8 ± 4.7.

- At baseline, the median duration of pain was 14 days, 8% had been on sick leave, and 27% experienced sciatic pain below the knee.
- At 6 months following the onset of pain, 13% of the patients experienced persistent or recurrent pain which increased to 19% at 2 years. A number of patients who reported that they were much improved at 6 months, felt worse at 2 years.

The analysis showed that 5 variables were protective from chronic pain, while 7 were predictive. *Protective variables included:*

1. completed college,
2. ability to walk for 1 hour,
3. ability to sleep tonight,
4. coping by TV or music, and
5. self-efficacy in ability to decrease pain.

Variables that were predictive of chronic pain included:

1. Additional pain in upper back,
2. higher level of least pain since onset,
3. smoking,
4. catastrophizing,
5. expectancy of chronicity, and
6. the need to hold onto something when getting off the sofa.

Clinical Decision Rule Derivation:

Variables were converted to scores that ranged to 60 points through a process of weighting the individual predictors according to their beta coefficients in the multivariate model. The point scores were then analyzed using a bootstrap procedure involving 1,000 replications which produced an odds ratio of 11.1 for having chronic pain at 6 months as well as 2 years after baseline when the score was increased by 10 points.

Optimal cutoff scores were identified that could be used to create three clinically useful risk groups (low, medium and high risk) at 6 months and 2 years. A score with a predictive value at or near 5% was considered an acceptable cutoff for the lowest risk group and a 40% predictive value was considered an acceptable cutoff for recommending further assessment and therapeutic measures.

The low-risk group comprised 47% of all patients, the medium-risk group 38%, and the high risk group 15%.

Likelihood ratios for correctly classifying patients into low-, medium-, and high-risk categories were as follows, respectively:

- at 6 months, 0.26 (95% CI: 0.14–0.48), 1.08 (0.79–1.5), and 4.35 (3.0–6.3); and
- at 2 years, 0.50 (0.34–0.72), 1.12 (0.82–1.52), and 3.14 (2.06–4.78).

Clinical Application & Conclusions:

According to the authors, this study was the first attempt to develop a CDR for predicting chronic LBP in patients with acute LBP. The results should help primary care clinicians decide whether an acute LBP patient with or without sciatica is at risk of developing chronic pain. If a patient is found to be at higher risk, closer follow-up and possibly more intensive therapeutic intervention may be necessary.

Clinicians who choose to use this CDR in practice should consider that the regression models explained only 16% of the variance in outcomes at 6 months and 10% at 2 years. This means that 84% and 90%, respectively, of the variance in outcomes is unexplained (i.e. due to other factors). More research is required in this area before we can confidently implement this CDR into practice. For now, this study is a logical first step that did identify both protective and predictive factors which will inform this subsequent work.

Study Methods:

This study was a longitudinal telephone survey of 18- to 70-year-old members of Kaiser Permanente, Northern California that was conducted over a 2-year period.

The definition of acute LBP was as follows: 'back pain between the rib cage and buttocks of less than 1 month duration that was severe enough to seek medical care and was not preceded by any other episodes of LBP in the past year.'

In order to be included in the study, patients had to speak English. Patients were excluded if they had a fever, history of cancer, chronic inflammatory disease, previous spine surgery, fibromyalgia, chronic pain conditions, disabling psychiatric diseases, or ongoing prescriptions for narcotics before the LBP episode.

Prospective subjects were screened for study inclusion by a computer program that scanned electronic medical records to identify patients with LBP. Selected patients were sent a written invitation to join the study by mail.

Phone interviews were administered at baseline and 6 months, whereas participants that completed the 2-year follow-up chose between a phone interview and an Internet-based survey.

The following clinical parameters were assessed at baseline:

1. Duration of current episode;
2. history of episodes;
3. pain-free interval before current episode;
4. pain location(s);
5. sciatica;
6. pain intensity by 11-point Numeric Rating Scale (NRS) as average, worst, and most tolerable pain or average bothersomeness;
7. McGill Pain Questionnaire;
8. Roland-Morris Disability Questionnaire (RMDQ);
9. days on sick leave and of reduced daily activities;
10. 24-item Orebro Musculoskeletal Pain Screening Questionnaire (OMPSQ);
11. 10-item Heidelberger Short Early Risk Assessment Questionnaire (HKF);
12. 4-item Perceived Stress Scale; and
13. additional psychological predictor variables (ex. fear-avoidance belief and catastrophizing)

Follow-up outcome measures also involved the assessment of the patients' lack of perceived recovery (less than 'much improved' on a six-point Likert Perceived Recovery Scale) in combination with their current pain intensity on the 0 to 10 NRS.

Study Strengths / Weaknesses

The following points should be considered when interpreting and applying the results of this study:

- The CDR has not been prospectively validated in an independent population. It is therefore not known how it will perform in the real world.
- There was a lot of variance in predictor item scores early in the acute LBP episodes, which reduces their predictive power. The recurrence rate among participants was high, which caused some of the patients to experience persistent pain at different points in time. This variance limits the usefulness of the rule, given that it may fail to perform well early in the course of a new episode of LBP.
- The only items included in the questionnaire were those that were known to be potentially predictive at the time of the study's implementation. There are likely many other items that could be of predictive value that were not included.
- Another limitation is that the sources of the data were diagnostic codes from electronic medical records and patient self-report. No clinical examinations or imaging studies were performed on these patients as part of the study.

Additional References:

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3. Von Korff M, Ormel J, Keefe F, Dworkin SF. Grading the severity of chronic pain. Pain 1992; 50: 133–49.