

Clinical Study

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

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Abstract

BACKGROUND CONTEXT: Primary care clinicians need to identify candidates for early interventions to prevent patients with acute pain from developing chronic pain.

PURPOSE: We conducted a 2-year prospective cohort study of risk factors for the progression to chronic pain and developed and internally validated a clinical decision rule (CDR) that stratifies patients into low-, medium-, and high-risk groups for chronic pain.

STUDY DESIGN/SETTING: This is a prospective cohort study in primary care.

PATIENT SAMPLE: Patients with acute low back pain (LBP, ≤ 30 days duration) were included.

OUTCOME MEASURES: Outcome measures were self-reported perceived nonrecovery and chronic pain.

METHODS: Patients were surveyed at baseline, 6 months, and 2 years. We conducted bivariate and multivariate regression analyses of demographic, clinical, and psychosocial variables for chronic pain outcomes, developed a CDR, and assessed its performance by calculating the bootstrapped areas under the receiver-operating characteristic curve (AUC) and likelihood ratios.

RESULTS: Six hundred five patients enrolled: 13% had chronic pain at 6 months and 19% at 2 years. An eight-item CDR was most parsimonious for classifying patients into three risk levels. Bootstrapped AUC was 0.76 (0.70–0.82) for the 6-month CDR. Each 10-point score increase (60-point range) was associated with an odds ratio of 11.1 (10.8–11.4) for developing chronic pain. Using a less than 5% probability of chronic pain as the cutoff for low risk and a greater than 40% probability for high risk, likelihood ratios were 0.26 (0.14–0.48) and 4.4 (3.0–6.3) for these groups, respectively.

CONCLUSIONS: A CDR was developed that may help primary care clinicians classify patients with strictly defined acute LBP into low-, moderate-, and high-risk groups for developing chronic pain and performed acceptably in 1,000 bootstrapped replications. Validation in a separate sample is needed. © 2015 Elsevier Inc. All rights reserved.

Keywords:

Low back pain; Chronic pain; Acute pain; Clinical decision rule; Prediction; Primary care

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EVIDENCE & METHODS

Context

The authors maintain that a clinical decision rule (CDR) is necessary to help primary care clinicians identify patients who may be at risk of developing chronic back pain at the time of presentation. This CDR was developed by the authors using a prospective cohort design that included 605 patients.

Contribution

An 8-item CDR was ultimately developed by the authors, classifying patients into three risk levels for chronic back pain. The discriminative capacity of this rule was found to be moderate using bootstrap techniques. Each 10-point increase in CDR score increased the odds of chronic back pain by a factor of 11.

Implications

The efficacy of this CDR is predicated on the generalizability of the population used to develop the rule to other patients who may be at risk of chronic low back pain. The clinical utility of the tool also rests on the notion that early intervention will alter the clinical course for those identified as being at high risk. This particular investigation is unable to address that pivotal issue. As the authors appropriately recognize, further validation of the CDR itself as well as its capacity to inform clinically relevant care is required.

—*The Editors*

Introduction

Although most patients presenting with an episode of acute low back pain (LBP) in primary care will recover in 6 to 8 weeks with or without medical intervention [1,2], those who subsequently develop chronic pain suffer considerably [3], often are difficult to treat, and account for most LBP-related health expenses [4]. Primary care clinicians need decision support to identify candidates for early interventions for secondary prevention of chronic pain. Previous studies have identified risk factors for chronic pain and have attempted to develop clinical decision rules (CDRs) for the primary care setting [5,6]. The most important are the STarT-Back developed in the United Kingdom [7,8] and the Chronic Pain Risk Screener developed in the United States [9]. The STarT-BACK and several instruments developed in Europe (Örebro Musculoskeletal Pain Screening Questionnaire [OMPSQ] [10,11], Kiel Pain Inventory and Avoidance-Endurance Questionnaire [12,13], and Heidelberg KurZ-Fragebogen (HKF) [14]) have not been evaluated in the United States. Other limitations of the latter instruments are that they were not developed or validated in primary care patients and used delayed return

to work as chronic pain outcomes, which only captures a subset of patients taking sick leave.

Both the STarT-BACK and Chronic Pain Risk Screener have been well validated in patients shortly after an index visit at a primary care office [15]. However, these index visit patients included patients with a wide range of LBP duration; less than half suffered from acute LBP. Because patients who suffer LBP for more than 3 months already have a much worse prognosis, instruments that work for this population may not perform as well in patients with acute LBP. Hence, clinicians need a tool that only addresses the prognosis of patients with truly acute LBP [1].

We, therefore, conducted a prospective cohort study to investigate the prognosis of patients with strictly defined acute LBP [16], and whether we can identify early risk factors that can help primary care clinicians determine a more accurate prognosis. If available, such risk stratification would be feasible for primary care clinics and could potentially support physicians in treatment allocation decisions. We included questionnaire items representative of all risk factors known at the time of the cohort's inception and set out to develop a novel CDR.

Methods

Patient selection

The prognosis of pain study was a 2-year longitudinal telephone survey of 18- to 70-year-old members of Kaiser Permanente, Northern California (KPNC), the largest integrated health plan in its region with 2.4 million adult members at the time. Acute LBP was defined as back pain between the rib cage and buttocks of less than 1 month that was severe enough to seek medical care and was not preceded by any other episodes of LBP in the past year. The 1-month criterion for acuteness of pain was chosen in part for pragmatic reasons, as we found that the time from scheduling a doctor's visit to being seen might be more than 2 weeks from the date of first pain onset. Patients were included if they spoke English and had no 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. Patients with sciatica (ie, LBP radiating below the knee) were not excluded.

A computer program screened electronic medical records to identify patients seen the day before for LBP, and a written invitation was sent by mail to join the study. This invitation offered a \$20 gift certificate and did not reveal the inclusion criterion of pain duration; it, therefore, prioritized minimization of false reporting over larger numbers of ineligible respondents. Respondents were interviewed over the phone at baseline and 6 months. For the 2-year follow-up, participants, when reached (maximum of three attempts), were given a choice between a phone interview and an Internet-based survey using

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