Can we predict poor recovery from recent-onset nonspecific low back pain: a systematic review

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CRD summary
This largely well-conducted review evaluated the association between prognostic factors and poor recovery in recent-onset non-specific low back pain. The authors concluded that there was little certainty regarding the most important prognostic factors and that the results of this review should be interpreted with caution. The authors’ conclusion reflects the limited evidence presented and is likely to be reliable.

Authors' objectives
To explore the evidence for prognostic factors for poor recovery in recent-onset non-specific low back pain (NSLBP).

Searching
MEDLINE, CINAHL, EMBASE, PsycINFO and AMED were searched (1966 to February 2007) for published English-language papers for inclusion in the review (search strategy reported to be available). The reference lists of relevant reviews and articles were scanned and citation tracking of authors was used to identify further articles.

Study selection
Prospective studies that tested (or enabled calculation of) the statistical association between prognostic factors at recent-onset (<12 weeks) NSLBP and at least one of the outcomes of pain, activity limitation and participation restriction were eligible for inclusion in the review. Excluded studies were: of pregnant women; of those with specific diseases (such as inflammatory arthritis, tumour and fracture); and those with more than 15% of participants with neurocompressive symptoms (with the exception of sciatica) or who had experienced an episode of NSLBP for more than three months. Pain outcomes reported in the short (<3 months) and long term included duration, improvement, intensity, satisfaction and recovery; activity limitation outcomes included bed rest, domestic activity limitation, Graded Chronic Pain Scale scores, Oswestry Score, recovery, Roland-Morris score; SF-36 score; and Sickness Impact Profile score. Participation restriction outcomes included duration of compensation, time off work and return-to-work duties. Most studies were conducted in primary or secondary care clinics. Two independent reviewers selected the studies for inclusion. Disagreements were resolved by discussion.

Assessment of study quality
Study quality was assessed using a score out of six criteria (Hudak et al 1996) that measured loss to follow-up, participant selection method, definition of prognostic and outcome variables, blinding and data quality.

Two independent reviewers assessed study quality; disagreements were resolved by discussion.

Data extraction
Bivariate and multivariable data were extracted on the frequency, strength and statistical significance of associations between predictor and outcome. Where data were available, odds ratios and 95% confidence intervals (CI) were calculated for the strength of association. The largest significant odds ratio for long-term results was reported in the review. Full data were reported to be available from the individual study authors.

Two independent reviewers extracted the data; disagreements were resolved by discussion.

Methods of synthesis
A taxonomy of comparable predictors and outcome associations was compiled. Studies were classified according to the three outcome domains (pain, activity limitation and participation restriction). Differences within the included studies were explored using the $X^2$ test, regression and discriminant analysis, Kaplan-Meier survival curves, principle components analysis and Cox proportional hazards models. Odds ratios and 95% CIs for long-term results were pooled.
in a random-effects meta-analysis. The impact of study quality on results was explored using t-tests and linear regression.

**Results of the review**
Fifty studies (1,501 prognostic factors and outcome associations) were included in the review. The mean quality score was 4.6 (standard deviation=0.9, range 2 to 6). One third of studies provided data enabling the calculation of odds ratios, and meta-analysis was possible for 8% of the factors.

A large number of prognostic variables were reported as predictors of poor recovery, including psychosocial variables, pain, physical impairment, clinician factors and therapeutic response. The most common factors with significant odds ratios were in the pain and psychosocial domains, but these were also the most frequently investigated and provided the required outcome data. There was a statistically significant inverse relationship between study quality and size of significant odds ratios; significantly higher odds ratios were derived from lower-quality studies (p=0.03).

**Authors' conclusions**
There was little certainty regarding the most important prognostic factors for NSLBP and results of this review should be interpreted with caution.

**CRD commentary**
The research question was broad, but supported by some appropriately detailed inclusion criteria. The search strategy accessed several relevant sources, but the restriction to published English-language articles meant (as the authors acknowledged) that language and publication biases could not be ruled out. Attempts were made to minimise errors and biases in all parts of the review process, a validity assessment appeared to use appropriate criteria and the impact of study quality on results was explored in sensitivity analysis. There was scant information on participant characteristics, which limited the interpretation of generalisability. As the authors pointed out, wide variation amongst the included studies in terms of outcome measures and methods used to identify prognostic variables, missing data, potential confounding between prognostic variables and the inverse relationship found for study quality and strength of associations meant that the results were inconclusive and should be interpreted with caution. The authors' conclusion reflects the limited evidence presented and is likely to be reliable.

**Implications of the review for practice and research**
**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that high-quality cohort or controlled trials were needed to further inform prognostic or covariate factor selection using standardised measurement methods and enabling pooling of data.

**Funding**
Joint Coal Board Health and Safety Trust (Australia) and National Health and Medical Research Council (Grant 384366).

**Bibliographic details**

**PubMedID**
17658288

**DOI**
10.1016/j.math.2007.05.009

**Original Paper URL**
http://www.manualtherapyjournal.com/article/S1356-689X(07)00090-2/abstract
Indexing Status
Subject indexing assigned by NLM

MeSH
Humans; Low Back Pain /diagnosis /rehabilitation; Multivariate Analysis; Odds Ratio; Outcome Assessment (Health Care); Prognosis; Recovery of Function; Risk Factors

AccessionNumber
12008104600

Date bibliographic record published
02/03/2009

Date abstract record published
23/12/2009

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.