Research Paper Review

Brief screening questions for depression in chiropractic patients with low back pain: identification of potentially useful questions and test of their predictive capacity.

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ABSTRACT

BACKGROUND:

Depression is an important prognostic factor in low back pain (LBP) that appears to be infrequent in chiropractic populations. Identification of depression in few patients would consequently implicate screening of many. It is therefore desirable to have brief screening tools for depression. The objective of this study was to investigate if one or two items from the Major Depression Inventory (MDI) could be a reasonable substitute for the complete scale.

METHODS:

The MDI was completed by 925 patients consulting a chiropractor due to a new episode of LBP. Outcome measures were LBP intensity and activity limitation at 3-months and 12-months follow-up. Single items on the MDI that correlated strongest and explained most variance in the total score were tested for associations with outcome. Finally, the predictive capacity was compared between the total scale and the items that showed the strongest associations with outcome measures.

RESULTS:

In this cohort 9% had signs of depression. The total MDI was significantly associated with outcome but explained very little of the variance in outcome. Four single items performed comparable to the total scale as prognostic factors. Items 1 and 3 explained the most variance in all outcome measures, and their predictive accuracies in terms of area under the curve were at least as high as for the categorised complete scale.

CONCLUSIONS:

Baseline depression measured by the MDI was associated with a worse outcome in chiropractic patients with LBP. A single item (no. 1 or 3) was a reasonable substitute for the entire scale when screening for depression as a prognostic factor.

ANALYSIS

Reviewed by Dr. Jeff Muir DC, (Research Review Service)

Background Information:

Pain and depression often co-exist (1-3), although the potential causal relationship between the two is not completely clear (4, 5). We do know the prognosis for low back pain is worsened with the presence of depression (and other psychosocial variables), however (6, 7). These factors often exist slightly outside our clinical 'comfort zone', but we should be cognisant of them and able to address them in a

sufficient and patient-centered manner.

Generally speaking, the proportion of low back pain patients seen in manual medicine practice who are also depressed is relatively low (8-10), yet a substantial proportion with borderline depressive scores has nonetheless been observed (9). Identifying this subset of patients may be an important adjunct to care and may help facilitate referral to mental health practitioners where appropriate.

A number of screening tools are currently used in practice settings, although it is unknown if the most common of these tools (e.g. the Major Depression Inventory, or MDI) accurately predicts outcomes in chiropractic patients. Also, the extensive nature of these questionnaires (e.g. length, in-depth questions) may be prohibitive in a typical chiropractic or physiotherapy clinical setting.

The objective of this study was to investigate whether the MDI is predictive of outcome in chiropractic practice and if so, whether one or two items from the MDI could potentially be used as an ultra-short tool for capturing depressive symptoms in LBP patients seeking care from chiropractors (or other manual therapy providers).

Pertinent Results:

Participants: The study cohort consisted of 925 chiropractic patients (45% females, mean age 43 years) who had completed the MDI (Major Depression Inventory). No differences were observed in LBP severity or on the completed MDI items. Follow up was completed by 79% and 74% of participants at 3 and 12 months, respectively.

MDI Scores: MDI scores were generally low (median 6, IQR 3–11) and 91% were categorized as non-depressed. Mild, moderate, and severe depression categories were indicated by 4%, 3%, and 2% of participants respectively. Signs of depression were generally associated with female gender, younger age, and a more severe LBP profile.

> **Association between total MDI score and outcome:** A statistically significant association was noted between LBP intensity and activity limitation at 3 and 12 month follow-ups. The effects regarding pain outcomes were small.

> **Association between total MDI score and single items:** Three MDI questions ("Have you lost interest in your daily activities?" [Q2], "Have you felt lacking energy and strength?" [Q3] and "Have you felt restless/Have you felt subdued or slowed down?" [Q8]) were considered candidates for brief screening questions based on correlation coefficients, while two additional questions ("Have you felt low in spirits or sad?" [Q1] and "Have you felt less self-confident?" [Q4]) were also considered, based on statistical similarity with overall MDI scores.

Association between single candidate items and outcomes:

All candidate items were significantly associated with the outcome measures, except for the question relating to LBP intensity at 12-months. Two questions ("Have you felt low in spirits or sad?" and "Have you felt lacking energy and strength?") were considered the best choices as brief screening questions.

Prediction of outcomes by the brief screening questions as compared with the total MDI:
Patients with signs of depression had more frequently persistent pain at 3-months follow-up, regardless of whether the definition of depression was based on the total MDI, Question 1, Question 3, or

Questions 1 and 3 combined. Overall, the predictive accuracy of depression was low with all definitions, although increased accuracy was noted when combining Questions 1 and 3 versus either question alone.

Depression in patients was noted to predict limitations in activity more accurately than pain, although these accuracies were generally low.

Clinical Application & Conclusions:

• Questions 1 (feeling low in spirits or sad) and 3 (lacking energy and strength) of the MDI (Major Depression Inventory) were reasonable alternatives to the total scale when ultra-brief screening questions are needed. In addition, depression as measured by the MDI was associated with prognosis in patients with LBP, but the ability of this finding to predict case outcome was low.

• While depression among patients seeking manual care for LBP is infrequent, it is nonetheless a valid health care concern. The findings of this study provide clinicians with a fast, simple and reliable method if identifying those patients who may be at risk of depression and may prove to be a worthwhile addition to standard screening forms.

Study Methods:

• **Study design:** This study was incorporated into a concurrent study (11) occurring at 17 chiropractic clinics in Denmark. Patients completed questionnaires during their intake forms and had follow-up questionnaires mailed to them after 3 and 12 months. The study received ethics approval from The Regional Scientific Ethical Committees for Southern Denmark.

• **Participants:** Consecutive patients aged 18–65 years attending chiropractic practice for the first time due to their current episode of LBP, and who could read Danish were potential participants.

• **Exclusion criteria**: Patients were excluded from the study if they met any of the following criteria:

1. Inflammatory or pathological pain were suspected
2. Nerve root involvement requiring acute referral to surgery
3. Pathology was diagnosed as the reason for LBP during the course of the study
4. Pregnancy
5. Having had more than one health care consultation due to LBP within the previous 3 months

• **Measurements**:

Depression was measured by the MDI (Major Depression Inventory – 12 questions answered by choosing one of six response options ranging from "At no time" [= 0] to "All the time" [= 5]). An MDI score out of 10 is calculated, based on patient responses. Two questions contain opposite possible answers, thus resulting in only 10 actual responses.

In addition to MDI, patients also responded to questions regarding LBP duration, prior episodes, intensity, leg pain intensity and activity limitation.

Data analysis:

Associations between the MDI and outcome were investigated in linear regression models. The Spearman correlation between each MDI question and the total MDI score was calculated, plus the variance explained (R-squared) in a linear regression model with the MDI sum score as dependent variable and the single item as the independent variable.

Associations between candidate items/questions and outcomes were also tested at 3 and 12 month follow-ups using linear regression. Area under curve and likelihood ratios for each question were calculated and compared with the MDI total score to allow reporting of more clinically interpretable results.

Study Strengths / Weaknesses

Limitations:

- Dropout rates of 21% and 26% were noted at follow-up.
- Slightly higher MDI scores were noted at baseline in those who dropped out, which may have resulted in underestimation of the effect of depression on outcome.

Strengths:

- The patient population was representative of the projected patient population in clinical settings.
- The single item/total score comparison accurately reflected the study objective and provided valuable data.

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