Screening for Depression in Chronic Low Back Pain
With the Beck Depression Inventory

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Patients with chronic low back pain (CLBP) have been identified as a high risk group for major depression. To increase treatment focus on depression in patients with CLBP, it has been suggested that all patients routinely be screened for level of depression. The current study examined the clinical utility of the Beck Depression Inventory as a screening measure for major depression in 113 patients with CLBP referred for assessment at a specialty pain clinic. Forty two patients (37%) met the DSM-III-R criteria for a diagnosis of major depression, and 11 patients (10%) met the criteria for dysthymic disorder. Sensitivity and specificity values for the BDI are reported for every cut-off score between 9 and 21. Positive and negative predictive values are also reported. A BDI cut-off score of 15 is recommended as optimal for clinical screening of patients with CLBP. It is suggested that routine screening may facilitate the early identification and treatment of depression in CLBP. Early intervention may decrease the negative impact of depression on the chronic pain experience and reduce the development of high levels of depression-related disability behaviour.

Prevalence rates of depression in patients with chronic low back pain (CLBP) have been reported to be three or four times higher than in the general population (Love, 1887; Sullivan, Reesor, Mikail, & Fisher, 1992). There are also indications that depression may adversely affect progress in chronic pain rehabilitation (Painter, Sores, & Newmanet, 1980; Kerns & Haythornthwaite, 1988). However, reports indicate that depression is likely to go untreated in the majority of depressed chronic pain patients (Haley, Turner, & Romano, 1985; Katon, Egan, & Miller, 1985; Rodin, Craven, & Littlefield, 1991). For example, several reports examining medication profiles in CLBP suggest that less than half of depressed chronic pain patients receive antidepressant medication, and dose levels are likely to be below the therapeutic range (Katon et al., 1985; Haley et al., 1985; France, Houpit, Skott, Krishnan, & Varia, 1986).

It has been suggested that the relative lack of attention to the treatment of depression in patients with CLBP may be the result of failure to detect depression (Dworkin & Gitlin, 1991; Rodin et al., 1991). For example, patients may focus primarily on physical complaints during medical evaluations and turn attention away from emotional concerns. Similarly, to avoid potential defensive reactions in their patients, clinicians may not directly address depressive symptomatology during medical evaluations. It has been suggested that as many as 50% of depressions may go undetected during medical evaluations (Rodin et al., 1991).

In order to increase treatment focus on depressive symptomatology, several investigators have suggested that chronic pain patients should be routinely screened for level of depression (Turner & Romano, 1984; Love, 1987; Rodin et al., 1991). Because of their ease of administration and scoring, self-report measures of depression such as the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), have been advocated as useful screening measures in the assessment of CLBP populations (Naliboff, Cohen, Swanson, Bonebakker, & McArthur 1985; Rodin et al., 1991).

The utility of self-report measures of depression for CLBP can be addressed by examining the sensitivity and specificity values of various cut-off scores in this population. Sensitivity refers to the probability that a patient with a diagnosis of major depression will score in the depressed range on a measure of depression. Specificity refers to the probability that a patient who does not have a diagnosis of major depression will score in the non-depressed range on a measure of depression. In a sample of 68 patients with CLBP assessed in a private practice clinic, Love (1987) reported that a BDI cutoff of 10 was associated with a sensitivity of 1.0 and a specificity of 0.98 for major depression. A structured interview using DSM-III (APA, 1980) criteria for major depression yielded a prevalence rate of 25%. Turner & Romano (1984) re-

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ported slightly lower estimates of sensitivity and specificity in a sample of 40 chronic pain patients (mostly CLBP) assessed in a specialty pain clinic. The prevalence of major depression was 30% using DSM-III criteria. With a cut-off score of 13, sensitivity and specificity estimates for the BDI were 0.83 and 0.82, respectively. With a cut-off score of 22, sensitivity was 0.42 and specificity was 1.00.

The above findings are encouraging in that they indicate that the BDI may be well suited as a screening device for major depression in patients with CLBP. However, generalizability of these results is tempered by the relatively small sample sizes upon which sensitivity and specificity estimates have been based. With a 25% prevalence of major depression in the sample reported by Love (1985), only 17 patients would be diagnosed as depressed. Similarly, the 30% prevalence of major depression reported by Turner & Romano (1984) would yield only 10 patients that were diagnosed as depressed.

There are indications that the diagnostic efficiency of self-report measures of depression may be lower than suggested by the findings of Love (1987) and Turner & Romano (1984). Self-report measures of depression have typically been associated with high rates of false-positive diagnoses, yielding prevalence estimates of depression that are approximately twice as high as estimates based on diagnostic interviews (Boyd & Weissman, 1982; Sullivan et al., 1992). Some of the factors contributing to high rates of false positive diagnoses using self-report indices include confounds with somatic symptomatology, the limitations of self-report measures in ruling out emotional distress associated with disorders other than depression, and the inclusion of symptoms not considered in the diagnostic criteria for depression. High rates of false-positive diagnoses would be reflected by lower specificity values than have been reported by Love (1987) and Turner & Romano (1984).

A re-examination of the sensitivity and specificity values associated with the BDI in a larger sample of patients with CLBP may be warranted before advocating the BDI as a suitable screening instrument for major depression. The goal of the current study was to re-examine the utility of the BDI as a screening instrument for depression in CLBP. A sample of 113 CLBP patients who were referred to an outpatient pain clinic were utilized. The clinical utility of the BDI as a measure of depression was addressed by examining the sensitivity and specificity of the BDI for diagnosis of major depression (DSM-III-R) for every cut-off score of the BDI between 9 and 21.

Because sensitivity and specificity values are of limited utility for clinical practice (Rodin et al., 1991) corresponding positive and negative predictive values for the examined cut-off scores are also reported. Positive predictive value refers to the probability that an individual scoring in the depressed range on a measure of depression will have a diagnosis of depression. Negative predictive value refers to the probability that a person scoring in the non-depressed range on a measure of depression will not have a diagnosis of depression.

METHOD

Subjects

The subjects sample consisted of 113 (61 men, 52 women) consecutive referrals to the Pain Clinic of The Rehabilitation Centre in Ottawa, Canada. All patients had a diagnosis of chronic mechanical low back pain defined as pain in the lumbo-sacral spine exceeding 6-months duration. The mean age of the sample was 40.7 years with a range of 19 to 65 years. At the time of the assessment, most patients (n = 70) were married, and most (n = 78) were unemployed. The mean duration of illness was 6.29 with a range of 1 to 36 years.

Procedure

All patients participated in a multidisciplinary evaluation with a physiatrist, rehabilitation nurse, physiotherapist, and a psychologist. Diagnosis of chronic low back pain was made by the physiatrist who also collected information relevant to patients' medication intake. The psychologist conducted a semi-structured interview to yield DSM-III-R (APA, 1987) diagnoses of major depression, dysthymic disorder or no depression. Patients also completed the BDI and the McGill Pain Questionnaire (MPQ; Melzack,
The BDI consists of 21 items assessing various symptoms associated with depression. Internal consistency estimates for the BDI have ranged between 0.73 and 0.95 (Beck, Steer & Garbin, 1988). In clinical samples, a score of 9, 16 and 21 have been suggested as cut-offs for mild, moderate and severe depressions, respectively (Beck, Steer & Garbin, 1988). On the MPQ, patients are asked to endorse numerically weighted adjectives that best describe their pain experience. The pain rating index (PRI) is a composite measure of all adjectives endorsed, where higher scores reflect more intense pain.

RESULTS

Forty-two patients (37%) met the DSM-III-R criteria for a diagnosis of major depression, and 11 patients (10%) met the criteria for dysthymic disorder. Sixty patients (53%) were not depressed at the time of the interview. There was no significant difference in the percentage of men (39%) and women (36%) with a diagnosis of major depression, $\chi^2 (1) = 0.11$, ns. Employment status was also unrelated to diagnosis of depression, $\chi^2 (1) = 0.31$, ns. Patients with a diagnosis of major depression were slightly younger ($M = 37.8$) than patients who were not depressed ($M = 41.7$), $F (1,57) = 3.0$, $p < 0.07$. Depressed and non-depressed patients did not differ significantly on current pain intensity or illness duration.

Figure 1 presents sensitivity and specificity values for all BDI cut-off scores between 9 and 21. The sensitivity values are consistent with those reported by previous investigators (Turner & Romano 1984; Love, 1987). With a cut-off of 10, sensitivity was 0.90 and with a cut-off of 13 sensitivity was 0.83. However, the specificity values in the current study were lower than those reported in previous work. Both Love (1987) and Turner & Romano (1984) reported specificity values exceeding 0.80. In the current study, for cut-offs of 10 and 13, the specificity values were 0.42 and 0.60, respectively.

The current findings suggest that a BDI score of 15 may be the optimal cut-off score for screening for major depression. A cut-off of 15 yields a sensitivity value of 0.80 and a specificity value of 0.70. With cut-off scores above 15, sensitivity falls below 0.80. The positive and negative predictive values for the BDI for all cut-off scores between 9 and 21 are provided in Table 1. With a cut-off of 15, 66% of patients would meet the diagnostic criteria for major depression.

DISCUSSION

Reports indicate that medical evaluations in primary care do not routinely address depressive symptomatology (Rodin et al., 1991). Consequently, approximately half of major depression may go undiagnosed, and untreated (Katon et al., 1985). In order to increase attention to the diagnosis and treatment of depression, self-report
measures of depression could be included as part of routine medical evaluation of patients with CLBP. Based on the findings of the current study, a cut-off score of 15 is recommended when using the BDI as a screening measure for major depression in CLBP patients. The results of this study indicate that more than two thirds of CLBP patients scoring 15 or above on the BDI are likely to have a diagnosis of major depression based on structured interview using DSM-III-R criteria.

The use of self-report measures of depression in clinical practice must proceed with appropriate caution. The hazards entail primarily the number of false-negative diagnosis. The current findings indicate that using a cut-off of 15 on the BDI, 20% of patients diagnosed with major depression will obtain scores in the non-depressed range. This value may be reduced by using a lower cut-off score, but at the expense of increasing the number of false-positive diagnoses. However, the hazards of using self-report measures in primary care must be weighed against the current status of assessment practices. If more than 50% of depressions are likely to be missed by current methods (Rodin et al., 1991), a false-negative rate of 20% would represent a substantive improvement. The BDI requires minimal time to administer and score, and can be easily incorporated into medical evaluations in primary care. Since patients identified as depressed on the BDI should be routinely assessed for major depression using structured interview based on DSM-III-R criteria, the use of lower cut-off scores may diminish the potential advantages of using screening measures. The current study yielded lower specificity values than reported in previous work (Love, 1987; Turner & Romano, 1984). One of the factors that is likely to contribute to inconsistent findings in specificity values concerns the selection biases associated with different treatment settings for CLBP. If referral practices minimize the range of psychiatric conditions seen at a particular setting, then specificity values are likely to be higher than when clinical settings accept a wide range of referrals. In other words, the base rate for disorders other than depression that are associated with emotional distress will influence the probability of detecting depression using a self-report measure. Clearly, an examination of the utility of the BDI for major depression across different patient populations is warranted (Turner & Romano 1984).

In addition to the use of screening measures in patients with CLBP, the identification of depression may also be facilitated by discussing the possibility of depression onset in patients who develop chronic pain. Research indicating that patients with CLBP are at high risk for the development of major depression indicates that such discussions may be warranted. If patients are made aware that they may experience depressive symptomatology, they may be more likely to report depressive symptoms when they occur. Open discussion of depressive symptomatology with patients with CLBP may reduce defensiveness related to concerns that the legitimacy of presenting problems is being questioned.

The early identification and treatment of depression in patients with CLBP may decrease the negative impact of the chronic pain experience and reduce the development of high levels of depression-related disability behaviour. Indeed, depression has been identified as a major factor associated with poor rehabilitation outcome (Dolce, Crocker, & Doleys, 1988). The treatment of depression in CLBP may improve rehabilitation outcome in this population. Sev-
neral rehabilitation programs include psychological interventions as a central component of rehabilitation. However, it has been noted that interventions typically target pain management and are aimed at developing coping strategies and reducing tension, anxiety and pain behav-

ior (Sullivan et al., 1992). Depression is often not a target of treatment in CLBP rehabilitation. Routine screening and/or assessment of depressive symptoms in CLBP patients may alert professionals to the need to treat depression in this population.

On a déterminé que les patients atteints de lombalgies chroniques constituent un groupe à haut risque de dépression grave. Pour rehausser l'attention portée à ce problème, on suggère le dépistage systématique des niveaux de dépression chez tous les patients de ce groupe. La présente étude examine l'utilité clinique de l'inventaire de dépression de Beck (IDB), visant à mesurer la gravité de la dépression chez 113 patients souffrant de lombalgies et qui avaient été envoyés en consultation anti-douleur. Quarante-deux (37 %) patients répondaient aux critères DSM-III-R de diagnostic d'une dépression grave et 11 patients (10 %) au critère de troubles dysthymiques. La sensibilité et la spécificité des valeurs de l'IDB sont rapportées à chaque note-seuil de diagnostic entre 9 et 21. Les valeurs prédictives positives et négatives sont également rapportées. La note-seuil de 15 est recommandée comme devant motiver le dépistage clinique de ce groupe de patients. On suggère que le dépistage systématique pourrait faciliter le diagnostic et le traitement précoce de la dépression chez ces patients. Une intervention rapide pourrait diminuer l'incidence négative de la dépression sur le vécu de la douleur chronique et réduire le développement des comportements débilitants liés à la dépression.

REFERENCES


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