Assessing Depression in Fibromyalgia Patients

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Purpose. This study investigated the relationships among four methods of detecting depression in patients with fibromyalgia.

Methods. Data were obtained from 100 women (mean age 43 years) who had been diagnosed with fibromyalgia. Instruments included a computerized Diagnostic Interview Schedule (C-DIS), Beck Depression Inventory (BDI), an adjusted “disease-free” BDI (BDI-A), and Minnesota Multiphasic Personality Inventory depression subscale (MMPI-D). Chance-corrected concordance, sensitivity, specificity, and accuracy among the four methods were calculated.

Results. The C-DIS detected 22% and BDI-A 29% with current major depression. The BDI and MMPI-D yielded higher estimates of 55% of the 44%, respectively. Agreement on the diagnosis among the four methods was significantly greater than chance. When compared with the C-DIS, the BDI was the most sensitive instrument and the BDI-A most specific.

Conclusions. The C-DIS and BDI-A appear to be more reliable methods for determining the presence of major depression in women with fibromyalgia than are the MMPI-D or standard BDI.

Key Words: Fibromyalgia; Depression; MMPI; Beck Depression Inventory.

Depression is frequently observed in persons with fibromyalgia [1-9]. Actual rates of depression vary depending on the particular group studied as well as the method used to make the diagnosis. From a clinical perspective, identifying patients with depression is important not only because depression is a treatable illness but also because it can have deleterious effects on the patient's ability to cope with fibromyalgia symptoms. Nevertheless, a major concern of several researchers and clinicians is that depression may be overestimated in medically ill groups, particularly in those where chronic pain is a predominant symptom [10-13]. This concern has led to the suggestion that depression scales developed originally to diagnose depression in general populations may be inappropriate for use with patients who have medically related pain from rheumatoid arthritis or fibromyalgia [14-18]. This criticism has been leveled not only at self-report questionnaires but also at clinical interviews and such standardized methods as the Diagnostic Interview Schedule. The question, then, arises as to how to use and interpret any of the existing methods to measure depression in fibromyalgia patients.

The purpose of this report is to share our experience with using four self-report methods of diagnosing depression in patients with fibromyalgia—the computerized Diagnostic Interview Schedule (C-DIS) [19], the Minnesota Multiphasic Personality Inventory (MMPI) [20], and two forms of the Beck Depression Inventory (BDI) [21]. On the BDI we identified items that could be considered “disease-biased” and made an adjusted “disease-free” BDI scale (BDI-A). Specifically, we
asked two questions: (1) What is the congruence among the four methods of measuring depression? (2) Is any other self-report method of measuring depression as accurate as the C-DIS?

PATIENTS AND METHODS

Patients
Data for this study were drawn from the records of the first 100 patients entering a 6-month, out-patient fibromyalgia treatment program. All were women between the ages of 20 and 70 years (mean age 43.0 ± 10.2) who had been diagnosed with fibromyalgia using the American College of Rheumatology 1990 classification criteria [22]. Number of tender points was 15.9 (±2.3). Years of symptom duration ranged from 0.5 to 40 (mean 8.9 ± 8.3) and time since diagnosis averaged 3.0 years (±3.0). Seventy-four percent were married. The sample averaged 14.4 years of education (±2.4). Sixty-six percent were currently working outside the home primarily in service, clerical, or professional occupations. Hours per week averaged 23 (±17). Five women worked more than 40 hours per week.

Measures of Depression
The C-DIS generates current and past diagnoses using Diagnostic and Statistical Manual of Mental Disorders (DSM-III) criteria. Evidence of test-retest reliability [19] and comparable levels of agreement with the "traditional" interviewer-administered DIS have been shown [23]. Only diagnoses of major depression (DSM-III 296.2 or 296.3) were considered in this study. The diagnosis was considered current if it had occurred within 4 weeks before testing. The C-DIS was chosen as the criterion against which the other self-report instruments were tested because it applies, in a systematic manner, the criteria and decision rules accepted by the American Psychiatric Association for diagnosing major depression. There is no evidence that the older interviewer-administered DIS is superior [24].

The BDI is a 21-item instrument that has been used extensively for measuring depression in medical patients. A single summed score can range from 0 to 63 with the higher score indicating greater depression. Scores of 14 or above are considered indicative of depression. Scores above 21 are suggested for identifying patients with moderate to severe depression. Substantial evidence exists for the BDI's reliability and validity in various populations [25].

The MMPI-D, a clinical depression subscale of the MMPI, measures mood, self-esteem, and feelings of inadequacy. Standardized scores higher than a T-score of 70 are considered significant deviancy from normal.

Procedures
Patients who were to begin the fibromyalgia treatment program underwent a screening and assessment process prior to entry. Sets of self-administered questionnaires, which included the BDI, were mailed to the patients with the request that they fill them out the day before their clinic visit and bring them along. A thorough medical history and physical examination, including the tender point testing, were obtained during an appointment with a rheumatologist and the diagnosis of fibromyalgia was confirmed. Formal psychological testing, which included the C-DIS and MMPI, was completed by the clinical psychologists 1-2 weeks after the clinic visit.

Analysis
Analysis of the data was carried out using the methods proposed by Blalock et al. [12], Peck et al. [16], and Turner and Romano [26] in their work on the use of depression scales with medically ill patients. First, eight rheumatologists were asked to look at the 21 items on the BDI and mark those that they believed were part of the syndrome process. There was 75% agreement or higher on three items: effort required to do things, difficulty sleeping, and sense of tiredness. Second, the three identified items were deleted from the BDI to make a modified "disease-free" version of the scale. Third, patients were classified as currently depressed or not depressed on each of the instruments using the cut-off points described above for the self-report instruments and the diagnosis generated by the C-DIS. Chance-corrected concordance among the four methods was calculated using the kappa statistic [27]. The ability of the BDI, the BDI-A, and MMPI-D to correctly classify patients into the two groups determined by the C-DIS was examined. Sensitivity (true positives), specificity (true negatives), and accuracy (correct classification) were calculated.

RESULTS

According to the C-DIS criteria, 22% of the patients had a current diagnosis of major depressive disorder. The standard BDI yielded 55% positive for depression, the BDI-A 29%, and the MMPI-D 44%. As shown in Table 1, chance-corrected concordance between each pair of instruments ranged from 61% to 79%, significantly above chance for each pair. A total of 40 cases were completely congruent for all four measures. In Table 2 the accuracy (correct classification), sensitivity,
and specificity of the various instruments in relation to the C-DIS are displayed. The standard BDI was the most sensitive instrument for detecting depression; however, it was also the least specific with a large number of false positives. Although the BDI-A detected fewer true positives, it was more specific than the standard BDI. The sensitivity of the MMPI-D was somewhat higher than the BDI-A and specificity somewhat lower. By setting the cut-off point on the BDI at greater than 21, many of the false positives are eliminated in the standard BDI and nearly all in the BDI-A. Using the higher cutoff point, the BDI in either the standard or the adjusted form was the most accurate.

### DISCUSSION

Our results show that two methods of assessing depression, the C-DIS and an BDI-A, yield approximately the same percentage of depressed patients (22% and 29%) as the results of Hudson et al. [4] and Goldenberg [2]. Both the standard BDI and MMPI-D estimate the percentage substantially higher. The findings suggest that three items on the BDI introduce disease bias into the scale. Fatigue, sleep difficulties, and effort required to get things done are major problems for all persons with fibromyalgia. Thus, they lack utility as independent markers of depression. In our sample, every patient marked at least one of the three items as the problem and most (75%) marked all three.

When the sample was separated by C-DIS diagnosis, there was no significant difference between the depressed group and the nondepressed group in their marking of the three items either in total number (depressed = 2.8, nondepressed = 2.6) or in the degree of distress for each of the three items (depressed = 4.5, nondepressed = 4.1). This is further evidence that the three items are not measuring depression but rather typical fibromyalgia symptoms and consequences. Once these items were removed from the BDI the number of false positives for depression dropped remarkably resulting in increased specificity of the scale. Unfortunately, there was also a loss of sensitivity but an overall gain of 16% in correct classification.

The consequences of error in either direction may be of concern. On the one hand, if using the standard BDI, sensitivity is maximized to the detriment of specificity, then patients with fibromyalgia are likely to continue to be seen as having high rates of depression. Not only are stereotypes reinforced in this manner, but health-care providers may fail to provide comprehensive treatment that takes into account both physical and psychological factors. On the other hand, if the BDI-A is used and specificity is maximized to the detriment of sensitivity, then the clinician risks failing to identify patients who are depressed and could benefit from anti-depressant medication and other forms of treatment for depression.

Both clinicians and researchers who work with fibromyalgia patients need to use their judgement in determining optimal cut-off scores on the BDI based on the purpose for which the inventory is to be used. Some attention should be given to the possibility of establishing new cutoff points for the BDI-A. Although the BDI-A had a specificity of 96% at a cutoff point of 21 or greater, its sensitivity at that cutoff was only 45%. Some attempt should be made to maximize the agreement with the C-DIS.

It should also be noted that all the patients in our sample were women. Therefore, the results cannot be generalized to men with fibromyalgia who, although few in number, might answer the depression questionnaires in some systematically different way.

Although we did not do an item analysis on the MMPI-D, we suspect that there are also syndrome-biased items on it. Pincus et al. [17] found items of this sort when studying the results of MMPI testing in RA patients. Many of the items on the MMPI depression subscale that rheumatologists predicted to be “disease-

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<td><strong>Kappa Statistics Expressed as a Corrected Observed Percentage Agreement for Each Pair of Instruments</strong></td>
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BDI, standard Beck Depression Inventory; BDI-A, adjusted Beck Depression Inventory; C-DIS, computerized Diagnostic Interview Schedule; and MMPI-D, Minnesota Multiphasic Personality Inventory depression subscale.

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<td><strong>Sensitivity and Specificity of the Instruments When Compared to the C-DIS Diagnosis of Major Depression</strong></td>
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<td>MMPI depression</td>
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BDI, Beck Depression Inventory; C-DIS, computerized Diagnostic Interview Schedule; and MMPI-D, Minnesota Multiphasic Personality Inventory.
related" for RA such as "I am about as able to work as I ever was" and "I hardly ever feel pain in the back of my neck" clearly would be considered syndrome-related for fibromyalgia patients also. Therefore, the percentage of patients considered depressed by the MMPI criteria is likely inflated.

A potential limitation of this study might be that the BDI was not collected on the same day as the C-DIS and MMPI. However, the data were collected within a 2-week period during which one would not expect mood to change dramatically and within the time limit set by DSM-III criteria for determining a current depression.

Also, criticisms have been made over the years regarding the use of computer interviews or other methods that eliminate human judgement in medical assessment. Erdman and colleagues [23] have shown that computer versions of the DIS are reliable and practical technologies for questioning patients about psychiatric symptoms and personal subjects. Patients seem to prefer the method because of the reduction in embarrassment and ability to work at their own pace. Other advantages of the computerized approach such as its completely standardized form and error-free presentation of questions are also cited. Wiens and others [28,29] have made persuasive arguments that methods which rely on empirically established frequencies and correlations are valid and may, in fact, be superior to clinical judgements.

We suggest that the C-DIS and the BDI-A are more reliable methods for determining the presence of major depression in fibromyalgia patients than are the MMPI-D or standard BDI. But, in addition, an interview with a skilled practitioner who is familiar with both the diagnosis of depression and the symptoms of fibromyalgia is essential for integrating the symptoms and diagnosis into the development of a comprehensive treatment plan.

REFERENCES


