The Value of Screening for Psychiatric Disorders in Rheumatology Referrals

Patrick G. O’Malley, MD, MPH; Jeffrey L. Jackson, MD, MPH; Kurt Kroenke, MD; In Kyu Yoon, MD; Edmund Hornstein, DO; Gregory J. Dennis, MD

Background: Musculoskeletal complaints are common and often unexplained and often lead to rheumatology referrals. The prevalence of psychiatric disease in patients with musculoskeletal complaints is unknown.

Objectives: To determine the prevalence of common psychiatric disorders among patients referred to a rheumatology clinic and the likelihood of establishing a rheumatic diagnosis if a psychiatric disorder is present.

Design: Prospective diagnostic survey.

Setting: Two hospital-based rheumatology clinics and a general medicine clinic.

Participants: A consecutive sample of newly referred patients (n = 185) and their rheumatologists (n = 9).

Intervention: Before their visit, all patients filled out a self-administered version of PRIME-MD (Primary Care Evaluation of Mental Disorders), a questionnaire that makes Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition: Primary Care Version, diagnoses of depressive, anxiety, and somatoform disorders. After the visit, the study rheumatologists, who were unaware of the PRIME-MD results, completed a questionnaire regarding their diagnostic assessment. These patients were compared with 210 patients with musculoskeletal complaints who were cared for in a general medicine clinic.

Main Outcome Measures: Psychiatric and rheumatic disorders.

Results: Compared with patients with musculoskeletal complaints in a general medicine clinic, patients referred to a rheumatology clinic had a higher prevalence of psychiatric disease (40% vs 29%; P = .008), had an almost 2-fold higher prevalence of anxiety disorders, and were more likely to have multiple psychiatric disorders (odds ratio = 2.70, 95% confidence interval = 1.50-3.00). The likelihood of a psychiatric disorder differed among patients with connective tissue disease, nonsystemic articular or periarticular disorders, and nonarticular disorders (27%, 38%, 55%, respectively; P = .006). In a best-fitting logistic regression model, psychiatric disorders markedly decreased the likelihood of a connective tissue disease (odds ratio = 0.24, 95% confidence interval = 0.09-0.62).

Conclusions: Forty percent of patients referred to a rheumatology clinic in this study had a psychiatric disorder, and its presence predicted a lower likelihood of a connective tissue disease. Prospective studies are needed to determine if screening for psychiatric disease before referring patients with unexplained musculoskeletal complaints would reduce costs or improve recognition of potentially treatable psychiatric disorders.

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Although musculoskeletal complaints are common among patients in primary care settings, accounting for more than half of all outpatient visits, clinicians are unable to make a precise diagnosis 15% to 30% of the time. Unexplained symptoms have been shown to be powerful predictors of common psychiatric disorders, such as depression, anxiety, and somatization. The relation between rheumatic symptoms and psychiatric disorders has been explored in a variety of ways. Some studies report a high prevalence of rheumatic symptoms in patients with psychiatric disease. Others, focusing on particular rheumatic disorders (such as systemic lupus erythematosus, rheumatoid arthritis, fibromyalgia, chronic fatigue syndrome, musculoskeletal pain, or low back pain), often found an association with anxiety, depressive, or somatoform disorders. Several prospective studies provide evidence of a causal relation between musculoskeletal pain and depression; in 1 study, there was a 2-way causal relation. However, most of these studies had 1 or more methodological limitations, including retrospective design, lack...
PATIENTS AND METHODS

All adults older than 18 years and newly referred to the rheumatology clinics at either Walter Reed Army Medical Center, Washington, DC, or Madigan Army Medical Center, Tacoma, Wash, were invited to participate. These rheumatology clinics serve large, geographically defined populations and receive referrals from numerous outlying clinics as well as from the medical centers’ ambulatory care clinics. These ambulatory care clinics provide primary care for both active-duty and retired military personnel and their families. Physicians can refer patients with rheumatic complaints when they deem further evaluation is warranted. The case-mix and demographics of the population cared for in a US Army medical center are similar to those in a civilian practice.19 The protocol was approved by the Walter Reed and Madigan Clinical Investigation Committees, and all study participants signed informed consent forms.

Before seeing the rheumatologist, each patient completed a questionnaire on symptom characteristics, symptom-related expectations of care, and self-rated health status (excellent, very good, good, fair, or poor). Psychiatric disorders were established using a self-administered version of PRIME-MD (Primary Care Evaluation of Mental Disorders). PRIME-MD is a validated instrument that makes Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition: Primary Care Version, criteria-based diagnoses of depressive, anxiety, and somatoform disorders.30 The overall diagnostic accuracy and interobserver agreement of PRIME-MD are comparable with those of other structured psychiatric interviews administered by mental health specialists. Rheumatologists were unaware of the PRIME-MD results.

With the self-administered version of PRIME-MD, depressive and anxiety disorders are diagnosed according to standard Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition: Primary Care Version, criteria.30 The somatoform section of the patient questionnaire inquires about 15 physical symptoms or symptom clusters that account for more than 90% of physical complaints (excluding upper respiratory tract symptoms) reported in the outpatient setting.13 After excluding 2 symptoms common in rheumatic disorders (back pain and pain in the limbs or joints), we categorized patients who reported being “bothered a lot” by 6 or more physical symptoms as having probable somatoform disorder. This symptom threshold identifies a group of somatizing patients with clinically significant functional impairment.12,31

After the visit, rheumatologists completed a questionnaire on (1) the presence of a systemic or regional process, (2) the presence of abnormal physical examination findings (yes or no), (3) the presence of abnormal laboratory test results (yes or no), (4) their attribution of the symptoms’ cause (organic, psychiatric, or both), (5) whether a treatment was recommended, (6) whether the symptoms were likely to resolve, (7) whether the patient would eventually receive a diagnosis, and (8) whether a diagnosis was made during that visit. If a diagnosis was made during the visit, a free-text field was provided to list their diagnosis(es).

Rheumatic diagnoses were based on the judgment of the evaluating rheumatologist using the clinical and physical examination data available. Two clinicians independently reviewed these diagnoses and classified them into 3 disease categories: connective tissue disease (CTD), non-systemic articular or periarticular, and nonarticular or other (Table 1). Interrater agreement was substantial (intraclass correlation coefficient=0.80), and any disagreement was arbitrated by 2 study investigators (P.G.O. and J.L.J.). The clinicians responsible for the categorization were given explicit definitions of the categories. Connective tissue diseases are those that require stringent diagnostic criteria and that are not controversial. Nonsystemic articular or periarticular disorders are regional disorders likely to account for the patient’s symptoms. Nonarticular or other disorders are those for which there is controversy about nosologic classification (ie, fibrositis, fibromyalgia, myofascial pain, etc) or for which referral to a rheumatology clinic might be considered of limited value.

To determine whether the types and frequency of psychiatric disorders in our rheumatology referral sample differed from those of general medicine patients with musculoskeletal symptoms, we compared our study patients with a control group of 210 adults presenting to the ambulatory care clinic of Walter Reed Army Medical Center for evaluation of a musculoskeletal complaint. These 210 control patients had been evaluated in a separate study4 but with many of the same measures, including the PRIME-MD, symptom severity and duration, health status, expectations of care, and serious illness worry.

Our primary outcome variables were the psychiatric and rheumatic diagnoses. χ² or Kruskal-Wallis tests were used for univariate categorical analysis, and Student t or rank sum tests were used for univariate comparisons of continuous variables. Multivariate analysis using stepwise logistic regression was performed. Variables that were significant on univariate analysis (P<.20) were entered into the logistic regression model. Fitting of the model was done based on the methods of Hosmer and Lemeshow.34

CHARACTERISTICS OF PATIENTS REFERRED TO A RHEUMATOLOGY CLINIC

The 185 patients were seen by 1 of 9 participating rheumatologists and had a mean age of 46 years (range, 18-87 years); 64% were women; 65% were white, 19% were black, 6% were Hispanic, and 5% were Asian; and 29% were col-
Table 1. Categories of Diagnosis in 185 Rheumatology Referral Patientsa

<table>
<thead>
<tr>
<th>Connective Tissue Disease</th>
<th>Nonsystemic Articular or Periarticular Disorders</th>
<th>Nonarticular or Other Disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inflammatory arthritis (17)</td>
<td>Osteoarthritis (38)</td>
<td>Fibromyalgia (13)</td>
</tr>
<tr>
<td>Rheumatoid arthritis</td>
<td>Bursitis or tendinitis</td>
<td>Myofascial pain (8)</td>
</tr>
<tr>
<td>Psoriatic arthritis</td>
<td>Crystalline arthropathy (10)</td>
<td>Soft tissue rheumatism (8)</td>
</tr>
<tr>
<td>Inflammatory bowel disease associated</td>
<td>Gout</td>
<td>Somatic manifestations of depression or anxiety (5)</td>
</tr>
<tr>
<td>Spondyloarthropathy (10)</td>
<td>Pseudogout</td>
<td>Mechanical low back pain (3)</td>
</tr>
<tr>
<td>Ankylosing spondylitis</td>
<td>Costochondritis (2)</td>
<td>Hypermobility syndrome (2)</td>
</tr>
<tr>
<td>Human lymphocyte antigen associated</td>
<td>Spondylosis (2)</td>
<td>Miscellaneous (1 each):</td>
</tr>
<tr>
<td>Vasculopathy (10)</td>
<td>Miscellaneous (1 each):</td>
<td></td>
</tr>
<tr>
<td>Raynaud</td>
<td>Carpal tunnel syndrome</td>
<td></td>
</tr>
<tr>
<td>Vasculitis</td>
<td>Heel spurs</td>
<td></td>
</tr>
<tr>
<td>Systemic lupus (9)</td>
<td>Ganglion cyst</td>
<td>Aphtous ulcers</td>
</tr>
<tr>
<td>Undifferentiated connective tissue disease (5)</td>
<td>Osteoporosis</td>
<td>Chronic muscle strain</td>
</tr>
<tr>
<td>Polymyalgia rheumatica or temporal arteritis (5)</td>
<td>Myopathy</td>
<td>Healthy</td>
</tr>
<tr>
<td>Systemic sclerosis or related disorders (4)</td>
<td>Medial meniscal tear</td>
<td>Obesity</td>
</tr>
<tr>
<td>Sjögren or sicca syndrome (5)</td>
<td></td>
<td>Pes cavus</td>
</tr>
<tr>
<td>Thyroid-related myopathy (1)</td>
<td></td>
<td>Dependent purpura</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Migraines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nonspecific polyarthritis</td>
</tr>
</tbody>
</table>

aValues in parentheses are the number of diagnoses.

Table 2. Patients With Musculoskeletal Complaints: Comparison of a Rheumatology Referral Group (n = 185) and a General Medicine Group (n = 210)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Rheumatology</th>
<th>General Medicine</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean, y</td>
<td>46</td>
<td>55</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Women, %</td>
<td>64</td>
<td>48</td>
<td>.005</td>
</tr>
<tr>
<td>Minority race, %</td>
<td>35</td>
<td>53</td>
<td>.001</td>
</tr>
<tr>
<td>College graduate, %</td>
<td>29</td>
<td>33</td>
<td>.28</td>
</tr>
<tr>
<td>Married, %</td>
<td>82</td>
<td>69</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Symptom Count, mean</td>
<td>3.2</td>
<td>3.8</td>
<td>.87</td>
</tr>
<tr>
<td>Duration, median No. of days</td>
<td>730</td>
<td>14</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Severity (1-10), mean</td>
<td>6.2</td>
<td>6.2</td>
<td>.93</td>
</tr>
<tr>
<td>Serious illness worry, %</td>
<td>67</td>
<td>68</td>
<td>.93</td>
</tr>
<tr>
<td>Recent stress, %</td>
<td>53</td>
<td>41</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Self-rated health status (very good to excellent), %</td>
<td>83</td>
<td>48</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Psychiatric disorders, %</td>
<td>Any</td>
<td>40</td>
<td>.2</td>
</tr>
<tr>
<td></td>
<td>Anxiety</td>
<td>27</td>
<td>.006</td>
</tr>
<tr>
<td></td>
<td>Depressive</td>
<td>25</td>
<td>.40</td>
</tr>
<tr>
<td></td>
<td>Somatoform</td>
<td>16</td>
<td>.69</td>
</tr>
<tr>
<td></td>
<td>Multiple</td>
<td>23</td>
<td>.02</td>
</tr>
</tbody>
</table>

*Ellipses indicate data not applicable.

lege graduates. Median symptom duration was 730 days; only 2% reported that their symptom had been present for less than 1 month and only 20% reported that their symptom had been present for less than 6 months. Many patients were worried that their symptoms could represent a serious illness (67%) or had interfered substantially with their usual activities (52%). Most patients identified 1 or more previsit expectations: 79% wanted an explanation of what was causing their symptoms, 59% wanted an estimate of how long their symptoms would last, 46% wanted a prescription, 36% wanted a diagnostic test, 12% wanted another referral, and 19% wanted something else (eg, reassurance or a treatment program).

Compared with general medicine patients with musculoskeletal symptoms, rheumatology referral patients were on average younger, more likely to be women, more likely to be married, and more likely to be white (Table 2). Rheumatology referral patients also reported a longer duration of symptoms, more recent stress, and worse health status, although they had equal symptom severity scores.

PREVALENCE OF PSYCHIATRIC DISORDERS

Forty percent of patients had a psychiatric disorder (Table 2), and the prevalence of each type of psychiatric disorder was similar between the 2 rheumatology clinics. The prevalences of major depression and panic disorder, specifically, were 7% and 5%, respectively.

Compared with general medicine patients, the rheumatology referral group had a higher overall prevalence of psychiatric disease (40% vs 29%), was nearly twice as likely to have an anxiety disorder, and was much more likely to have more than 1 psychiatric disorder (odds ratio [OR] = 2.70, 95% confidence interval [CI] = 1.50-5.00).

COMPARISON OF PATIENTS WITH AND WITHOUT PSYCHIATRIC DISORDERS

Among patients with and without psychiatric disorders, there were no differences in demographics, duration of symptoms, or limitations in activities as a result of the symptoms. However, patients with psychiatric disorders reported more serious illness worry (OR = 1.30, 95% CI = 1.00-1.60), more recent stress (OR = 4.40, 95% CI = 2.60-6.90), higher symptom severity (6.7 vs 5.9; P = .005), more somatic symptoms (median, 6 vs 3; P < .001), and worse health status (P < .001).

There were no differences between patients with and without a psychiatric disorder in (1) the likelihood of having regional vs systemic symptoms and abnormal physical examination or laboratory test findings, (2) recommendations for treatment, or (3) the rheumatologist’s belief that the symptoms would eventually resolve or that the patients would eventually receive a definitive diagnosis. However, patients with a psychiatric disorder were...
much less likely to receive a diagnosis of a CTD (unadjusted OR = 0.42, 95% CI = 0.21-0.84).

The rheumatologists considered the cause of their patients’ musculoskeletal symptoms to be secondary to “a psychiatric cause only” in 6% of patients, “both organic and psychiatric causes” in 9% of patients, and “an organic cause only” in 86% of patients. Of all patients with psychiatric disorders, 25% were identified by the evaluating rheumatologist as having a psychological cause of the symptoms. Results of the PRIME-MD confirmed a psychiatric diagnosis in 3 of 5 patients that the rheumatologists actually diagnosed as having a psychiatric disorder. The 74 patients with a psychiatric diagnosis on PRIME-MD received 103 diagnoses by the evaluating rheumatologists (some were given multiple diagnoses); only 3% of these were psychiatric diagnoses.

**RHEUMATIC FINDINGS AND DIAGNOSES**

Most patients (83.8%) were given a diagnosis (some had multiple diagnoses) after the initial visit (Table 1). Fifty-six patients (30.3%) had 66 diagnoses of a CTD; 64 patients (34.6%) had 77 diagnoses of a nonsystemic articular or periarticular disorder—predominantly osteoarthritis (38 diagnoses), bursitis or tendinitis (19 diagnoses), and crystalline arthropathy (10 diagnoses); and 35 patients (18.9%) had 47 diagnoses of nonarticular or other diagnoses. Thirty patients (16.2%) were given no diagnosis after the visit.

As shown in Table 3, except for age, there were no differences among the 3 rheumatic categories in demographics (patients with nonsystemic articular or periarticular disorders were, on average, 11 years older). There were also no differences among the 3 diagnostic groups in overall health status, symptom severity or duration, recent stress, or previsit expectations for care. There was a progressive increase in the proportion with serious illness worry (55% vs 62% vs 80%; \( P = .01 \)) and in the number of somatic symptoms endorsed (4.9 vs 5.2 vs 6.5; \( P = .008 \)) from the CTD group to the nonsystemic articular or periarticular disorders group to the nonarticular or other disorder group.

Abnormal findings on physical examination were more common with CTDs and regional disorders, and abnormal laboratory test results were more common with CTDs. The prevalence of psychiatric disorders differed among patients with CTD, nonsystemic articular or periarticular, and nonarticular or other disorders (27%, 38%, and 55%, respectively; \( P = .006 \)). A similar “gradient effect” was evident for the prevalence of every category of psychiatric disorder (Figure).

**PREDICTORS OF RHEUMATIC DIAGNOSES**

Variables that were significant (\( P < .20 \)) on univariate analysis (age, marital status, educational level, symptom duration, serious illness worry, systemic process, the presence of abnormal physical examination or laboratory test findings, and the presence of psychiatric disease) were entered into a logistic regression model with other variables that could possibly confound the relation between psychiatric disease and rheumatic diagnosis (site, sex, and symptom severity). The best-fitting model is shown in Table 4. A systemic process (OR = 7.00, 95% CI = 2.70-17.60) and the presence of psychiatric disease (OR = 4.70, 95% CI = 1.60-14.30) were predictive of a CTD.

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The presence of an abnormal laboratory test result was not a significant predictor after controlling for all other pertinent variables (OR = 1.40, 95% CI = 0.63-3.40). The presence of a psychiatric disorder significantly reduced the likelihood of a CTD (OR = 0.24, 95% CI = 0.09-0.62).

In this study of 185 patients with musculoskeletal complaints referred to a rheumatology clinic, 40% had a psychiatric diagnosis; in this subset, CTD was uncommon.

Compared with general medicine patients with musculoskeletal complaints, rheumatology referral patients had a higher overall prevalence of psychiatric disease (40% vs 29%). Although the prevalence of somatoform and depressive disorders was almost identical in the 2 samples, anxiety disorders were more common (27% vs 15%) in the rheumatology referral patients, who were also 3 times more likely to have multiple comorbid psychiatric disorders.

Patients with a psychiatric disorder were less than half as likely to have a CTD (OR = 0.42, 95% CI = 0.21-0.84). This relation was strengthened when adjustment was made for the presence of abnormal physical examination and laboratory test findings and the rheumatologists’ impression of the presence of a systemic process, with the odds of a CTD declining to less than 25% (OR = 0.24, 95% CI = 0.09-0.62).

Of patients who received a diagnosis, nearly two thirds were diagnoses that could be considered to be under the purview of a generalist (Table 1). Most of these are responsive to standard therapy and are known to have a relatively uncomplicated prognosis. There are factors about these patients that are vexing enough for the generalist to prompt referral. It is unclear whether the ultimate diagnoses by the rheumatologist are the dominant causes of their symptoms or merely coincidental factors interacting with psychic distress. Psychiatric disorders have been shown to be associated with an increased number of somatic symptoms, increased symptom severity, and an increased likelihood of seeking medical help for symptoms. Although the psychiatric disorders detected by PRIME-MD might have been unrelated to the musculoskeletal complaints, it is also possible that the presence of a psychiatric disorder either amplifies the musculoskeletal symptoms in these patients or increases diagnostic uncertainty for the referring physician.

Moreover, diagnostic suspicion bias cannot be excluded, namely, the possibility that a rheumatologist might inadvertently over-read findings as an explanation for symptoms. In this study, for example, the prevalence of “early osteoarthritis” in patients with or without musculoskeletal complaints is unknown, as is the interobserver agreement for such borderline findings among different rheumatologists. Consistent with this phenomenon are the results of recent studies of diagnostic procedures that show high base rates of minor test abnormalities in asymptomatic individuals.

The presence of a psychiatric disorder detected by PRIME-MD or other interview techniques does not preclude referral to a rheumatologist in selected patients with unexplained musculoskeletal symptoms. However, time is the arbiter of all CTDs. Those concerned about the possibility of missing serious disease if referral is deferred in patients with a newly discovered psychiatric diagnosis can be reassured by the low prevalence of CTD among such patients, particularly if they also have no evidence of a systemic process, abnormal physical examination findings, or abnormal laboratory test results.

Our study has several limitations. First, the sample was drawn from only 2 military medical centers, a relatively “cost-neutral” reimbursement system in which the economic incentives either favoring or limiting referral practices may differ from other settings. Second, there was no assessment of the interobserver agreement among the evaluating rheumatologists individually or by site. However, although there were slight differences between the sites on a few variables (study patients at Madigan Army Medical Center were slightly younger and had slightly more CTDs), other variables were not different, and any differences disappeared after adjusting for the variables in our logistic model. In addition, there were no differences between individual rheumatologists in the distribution of variable responses.

In summary, among patients referred to a rheumatology clinic, the overall prevalence of psychiatric disease was higher than in our general medicine patients with
musculoskeletal complaints. Anxiety disorders were almost 2-fold higher, and more patients had multiple psychiatric disorders. The presence of a psychiatric disorder significantly reduced the likelihood of a CTD, and this reduction was strengthened when taking into account the presence of a systemic process or physical findings. Furthermore, rheumatologists infrequently attributed patients’ symptoms to psychiatric disease at the time of the initial encounter. Consequently, when such patients are referred for subspecialty evaluation, a greater use of medical resources is likely. Screening for psychiatric disease in patients with unexplained musculoskeletal symptoms would be more appropriate in the primary care setting before referral, although rheumatologists might also consider such a practice to better understand all factors that would impact the patient’s illness. Prospective studies are needed to determine if earlier diagnosis and treatment of psychiatric disorders in patients with unexplained musculoskeletal symptoms can improve patient outcomes and decrease health care costs.

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REFERENCES