

Association of Depression and Rheumatoid Arthritis

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This study assessed the relative strength of the association of physical characteristics and social stresses with a diagnosis of depression in patients with rheumatoid arthritis. Depression and social difficulties were assessed in 74 patients with rheumatoid arthritis by using standardized research interviews. Rheumatoid arthritis activity, damage related to rheumatoid arthritis, and subjective functional disability were assessed with well-validated methods. Twenty-nine patients (39.2%) were depressed. Compared to nondepressed patients, depressed patients had more marked social difficulties related to rheumatoid arthritis (72.4% versus 46.7%, respectively) and more marked social difficulties independent of rheumatoid arthritis (55.2% versus 31.1%, respectively). With logistic regression, social difficulties, independent of rheumatoid arthritis, was the only variable significantly associated with depression. Demographic characteristics and rheumatoid arthritis were not associated with a diagnosis of depression. Recognition by clinicians of the importance of social stresses, independent of disease state, should lead to more appropriate and specific psychological and social treatment of depression in rheumatoid arthritis.

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Anxiety and depressive disorders occur in 20%–25% of patients with rheumatoid arthritis.¹ These psychological problems are likely, at least in part, to be the result of having chronic physical symptoms such as pain and disability.^{2–9} However, the extent to which pain and disability are associated with psychological symptoms appears to be weak and inconsistent in mild to moderate rheumatoid arthritis; rheumatoid arthritis appears to be only directly associated with clinically significant psychiatric syndromes in patients with the most severely disabling rheumatoid arthritis.¹⁰ Wolfe and Hawley¹¹ concluded that there is a link between depression and clinical status and clinical change, but most depression remains unexplained by clinical (disease-related) models.

Factors such as social stresses and social isolation may be required for depression to develop in patients with less severe rheumatoid arthritis. Social stresses are recognized as being potent causes of depression in the general population and have been associated with depression in rheu-

matoid arthritis.^{1,12–14} Particularly important in causing depression are stresses in which the degree of threat to the individual is great—so-called severe events and marked difficulties.¹⁵ Care must be taken in interpreting the findings of previous studies, however, as measurement artifacts may increase the apparent association between depression and social factors. Depressed people are prone to view their lives as more stressful than nondepressed people and have recorded, on a self-administered questionnaire, that they have experienced more difficulties with finances, housing, and interpersonal relationships as a reflection of their mental state.¹⁵

The aim of the present study was to assess the relative

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importance of demographic variables, factors related to rheumatoid arthritis disease, and social stresses in determining whether ambulant outpatients were depressed. Great care was taken to ensure that any association between variables was not the result of measurement artifacts by using detailed interviews and rating physical, psychological, and social variables independently. We hypothesized that, compared to nondepressed patients with rheumatoid arthritis, depressed patients with rheumatoid arthritis have experienced more severe social stresses and social stresses have made a significant contribution to whether patients were diagnosed as depressed, independent of the effects of demographic or disease-related variables.

METHOD

Consecutive women attending a rheumatology clinic with a diagnosis of rheumatoid arthritis as defined by American Rheumatism Association criteria¹⁶ were approached for the study. The study was limited to women to ensure adequate rates of depression and to ensure that the group was as homogeneous as possible with regard to the interactions of demographic variables, disease characteristics, and social stresses. Of 85 patients approached, 74 consented and completed the assessments (an 87.1% rate of response). Subjects consenting to take part in this study were representative of women with rheumatoid arthritis attending the rheumatology clinic, being no different in terms of age or duration of rheumatoid arthritis.

The activity and damage of rheumatoid arthritis were assessed (by E.H.) using score on the Overall Status in Rheumatoid Arthritis,¹⁷ a validated instrument that scores 0–2 on five items of activity (e.g., pain, early morning stiffness, number of active joints, extra-articular disease) and five items of damage (e.g., number of destroyed or replaced large joints, small joint impairment, and organ involvement). The Overall Status in Rheumatoid Arthritis¹⁸ has been shown to correlate highly with other, more detailed validated measures of activity and damage in rheumatoid arthritis, both cross-sectionally and longitudinally. Functional disability was measured by using the Modified Stanford Health Assessment Questionnaire,¹⁹ a self-completed questionnaire used widely in rheumatoid arthritis studies and included in the American College of Rheumatology core set of outcome variables.²⁰ The Health Assessment Questionnaire score ranges from 0 to 3, with higher scores indicating greater functional impairment.

Social class was graded (range = 1–36) according to occupation by using the criteria of Goldthorpe and Hope.²¹

In this classification, subjects in the professions are allocated low numbers, and unskilled manual workers are allocated high numbers. This assessment was based on current employment of subjects, the partner's job if the subject was on sick leave or chose not to work outside the home (e.g., a housewife), and the last job if the subject was retired. On this scale, scores of 22 or more indicate that patients are employed in manual (as opposed to nonmanual) work, and this cutoff was taken to indicate that subjects were of a lower social class.

The psychiatric status of each patient was assessed with a standardized research interview, the Psychiatric Assessment Schedule.²² This assesses psychiatric symptoms over the last month by means of a detailed semistructured interview. Each symptom is rated on a 3-point scale, and any symptom (e.g., sleep loss or weight change) that might be attributable to physical illness is excluded. The results of the Psychiatric Assessment Schedule were analyzed by using the computerized diagnostic algorithm CATEGO,²³ which identifies a psychiatric disorder by using a hierarchical index of definition. There are three relevant categories of psychiatric diagnosis:

1. Index-of-definition levels 5 to 8 represent definite psychiatric diagnosis, which is generally accepted as requiring specific treatment; "cases" of anxiety and depression greatly overlap and are regarded, in this article, as a single group for brevity, referred to here as depressive disorders.

2. Index-of-definition level 4 indicates subthreshold anxiety or depression, referred to here as depressive symptoms, in which clear symptoms are present but not in sufficient number or severity to merit a definite diagnosis of depressive disorder.

3. Index-of-definition levels 0 to 3 indicate that the individual does not have significant psychiatric symptoms. In this study, index-of-definition levels 4 and 5 to 8 were combined to constitute depressed patients. No attempt was made to measure the time of onset of these disorders.

Social stress was measured by using the Life Events and Difficulties Schedule.¹⁵ This assessment has been widely used in community studies of depression and measures the severity of social stress, independent of the tendency of depressed persons to perceive their environment as more stressful than nondepressed persons. Details of life events (discrete stresses, e.g., bereavement, divorce) and chronic difficulties (ongoing difficulties, e.g., seriously ill relative or marked marital discord) were recorded for the previous year. Stresses were categorized into those clearly related to rheumatoid arthritis (e.g., hospital admission,

time off of work because of ill health) and those clearly independent of rheumatoid arthritis (e.g., husband developed cancer). A panel of raters who were blind to whether patients were depressed judged the severity of stresses. The results are expressed as a summary score of life events and/or marked social difficulties (a high score indicates greater stress). In addition, the number of women experiencing severe events (i.e., those that carried a high degree of threat, e.g., loss of a spouse, marital separation) and marked difficulties (severe ongoing problems, e.g., a first-degree relative who was terminally ill, a marital problem that was likely to lead to separation) was recorded.

Baseline variables are presented as means and standard deviations (for normally distributed data) or as medians and interquartile ranges for the remainder. Comparison of scores for depressed versus nondepressed patients were made by using Student's *t* tests for normally distributed variables and Mann-Whitney *U* tests for nonnormally distributed variables. Categorical variables were compared by using chi-square tests or Fisher's exact tests.

Logistic regression was performed to examine which demographic variables related to rheumatoid arthritis and which of the two types of social stresses were most closely associated with depressed or nondepressed groups. Age and measures of rheumatoid arthritis severity and disease activity (rheumatoid arthritis duration, pain, duration of early morning stiffness, number of active joints, presence of extra-articular disease, number of replaced or destroyed large joints, erythrocyte sedimentation rate), rheumatoid arthritis-related disability, and measures of social stress (related to rheumatoid arthritis and rheumatoid arthritis independent) were entered as independent variables by using forward-conditional-variable entry. Missing data were created by using mean substitution.

RESULTS

The mean age of the study group was 56.1 years (*SD* = 11.5). The mean score on the Health Assessment Questionnaire was 1.6 (*SD* = 0.75), and the mean duration of rheumatoid arthritis was 9.3 years (*SD* = 7.1). Among our patients, 19 (25.7%) had definite psychiatric disorders (seven with anxiety, and 12 with depressive disorders), and 10 (13.5%) were borderline cases; therefore, 29 (39.2%) overall were classified as depressed. The remaining 45 women (60.8%) did not have a psychiatric disorder.

The demographic and rheumatoid arthritis disease characteristics of the depressed and nondepressed groups are shown in Table 1. There were nearly significant find-

ings for depressed women to experience moderate or severe pain ($p = 0.07$) and longer early morning stiffness ($p = 0.11$). Otherwise, there were no differences in age, disability, or measures of disease activity/severity.

Compared to nondepressed patients, the depressed group was significantly more likely to belong to a lower social class ($p = 0.002$) (Table 2). There were significant differences in the social difficulties experienced by the patients in the two groups (Table 2). Depressed patients were more likely to experience social difficulties, both related to rheumatoid arthritis ($p = 0.004$) and independent of rheumatoid arthritis ($p = 0.009$).

When the comparison between groups was limited to severe life events or marked difficulties, the differences remained (Table 2); 89.7% of the depressed women experienced such an event or difficulty compared to 57.5% of the nondepressed group ($p = 0.004$, Fisher's exact test). The difference between the two groups was significant for severe events/ marked difficulties related to rheumatoid arthritis and of borderline significance for severe events/ marked difficulties dependent of rheumatoid arthritis (Table 2).

With logistic regression analysis, only social stresses independent of rheumatoid arthritis were significantly associated with depression (adjusted odds ratio = 1.6; Wald = 11.1, *df* = 1 $p < 0.0005$). Other demographic and disease-related factors and stresses related to rheumatoid arthritis were not associated with a diagnosis of depression.

To better understand the association between social stresses and psychiatric disorders, we compared those with a definite psychiatric disorder (index-of-definition levels 5 to 8) and those with borderline cases (index-of-definition level 4) to noncases (index-of-definition levels 0 to 3) with regard to the social stresses experienced (Table 3). The patients with a borderline psychiatric disorder ($N = 10$) had a clear excess of stresses related to rheumatoid arthritis compared to noncases (Mann-Whitney *U* test = 130.5, $p = 0.03$). Those with a definite psychiatric disorder had a clear excess of both rheumatoid arthritis-related (Mann-Whitney *U* test = 271.0, $p = 0.02$) and rheumatoid arthritis-independent (Mann-Whitney *U* test = 202.5, $p < 0.0005$) stresses.

DISCUSSION

In this study, we aimed to examine the relative strength of association of demographic factors, disease-related variables, and social stresses with a diagnosis of depression in patients with rheumatoid arthritis. We found that ambulant depressed female patients with rheumatoid arthritis had

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more marked social stresses than the remainder, thus confirming hypothesis one. These stresses contributed to which patients had a diagnosis of depression, even after control for demographic and physical characteristics related to rheumatoid arthritis, thus confirming hypothesis two.

Despite the fact that the difference between depressed and nondepressed patients was greater for social stresses related to rheumatoid arthritis than for social stresses independent of rheumatoid arthritis, only the latter were independently associated with who had a diagnosis of depression on multivariate analysis. This was presumably due to an interaction between stresses related to rheumatoid arthritis and disease characteristics, resulting in neither of these factors contributing to the statistical model. Demographic factors also failed to contribute significantly.

Psychiatric symptoms not amounting to a definite psychiatric disorder were seen in association with an excess of social stresses related to rheumatoid arthritis, whereas a

definite psychiatric disorder occurred in association with an excess of both social stresses related to and independent of rheumatoid arthritis.

Our study has a number of methodological strengths. First, we recruited consecutive women with rheumatoid arthritis; thus, our group should have been representative of women attending the rheumatology clinic at our hospital. The scores recorded on the Health Assessment Questionnaire are comparable with previous similar studies.^{13,18,24} However, the scores on the Overall Status in Rheumatoid Arthritis are rather low; compared with the original validation report, the damage score of our group is typical of people in the first decade of the disease,¹⁶ whereas the activity score is at the lower end of the expected range. It is possible that different results would be obtained in a more severely disabled group of patients with rheumatoid arthritis.

Second, great efforts were taken to ensure that mea-

TABLE 1. Psychosocial Variables in Depressed and Nondepressed Patients With Rheumatoid Arthritis

Variable	Depressed Patients (N = 29)		Nondepressed Patients (N = 45)		Analysis of Group Difference		
	Mean	SD	Mean	SD	t	df	p
Age (years)	56	12	56	11	0.21	72	0.80
	<i>Median</i>	<i>Interquartile Range</i>	<i>Median</i>	<i>Interquartile Range</i>	<i>Mann-Whitney U</i>		<i>p</i>
Score on Health Assessment Questionnaire (range = 0–5) ^a	1.62	1.31–2.31	1.62	0.94–2.12	587.5		0.47
Duration of rheumatoid arthritis (years)	8	5–14	8	3–11	554.5		0.64
Score on Overall Status in Rheumatoid Arthritis (17)							
Activity	2	0–4	1	0–3	391.0		0.12
Damage	1	0–2	1	0–2	494.5		0.89
Rate of erythrocyte sedimentation	36	18–56	22	16–40	214.0		0.19
	<i>N</i>	<i>%^b</i>	<i>N</i>	<i>%^b</i>	<i>Fisher's exact test</i>		<i>p</i>
Moderate/severe pain	14	58.3	14	33.3			0.07
Early morning stiffness lasting ≥60 minutes	8	33.3	5	11.9			0.11
Number of active joints ≥3	7	29.2	12	28.6			1.00
Extra-articular disease (nodes and/or vasculitis)	1	4.2	4	9.5			0.65
Functioning (difficulties and/or housebound)	8	33.3	12	28.6			0.78
One or more large joint destroyed/replaced	3	12.5	10	23.8			0.35
Small joint impairment							
None	15	62.5	29	69.0			0.60
Collar required, etc.	6	25.0	11	26.2			
Surgery performed/required	3	12.5	2	4.8			0.35
Organ impairment >6 months	0	0.0	2	4.8			0.53
Positive rheumatoid factor	26	89.7	43	95.6			0.34

^aHigher score means more functional impairment.

^bPercents based on N = 24 for depressed patients and N = 42 for nondepressed patients, with the exception of positive rheumatoid factor.

asures were used that minimized any spurious inflation of associations sometimes seen when measures of depression include “somatic” items (e.g., items on sleep or function) that may be attributable to rheumatoid arthritis rather than depression.²⁵ Our measure of social stress had been specifically designed to avoid the tendency of depressed persons to recall more social difficulties and rate them more pessimistically. It was sufficiently detailed to separate the social difficulties arising from rheumatoid arthritis and those occurring independently.

Our findings confirm that social stresses independent of rheumatoid arthritis are important in determining which patients with rheumatoid arthritis are diagnosed as being depressed. Although the number of patients recruited was necessarily small due to the length of the assessment (up to 3 hours per subject), our patients were representative of the women attending the rheumatology clinic, and it is unlikely that larger numbers would have reduced the relative

importance of social stresses in this group. It should be recognized, however, that because of the relatively small number of women recruited, we cannot rule out the possibility that other factors (demographic, physical, or stresses related to rheumatoid arthritis) were also associated with a diagnosis of depression, although we failed to detect this because of low statistical power. Confining our study to ambulant outpatients may have further reduced our chances of detecting an association of disease characteristics and stresses related to rheumatoid arthritis with a diagnosis of depression in patients with rheumatoid arthritis. Further studies with larger populations would be required to assess the importance of these other factors. Furthermore, inclusion of subjects with more severe rheumatoid arthritis, e.g., hospital inpatients, might reveal that variables related to rheumatoid arthritis are associated with depression.

Other studies with multivariate analysis identifying

TABLE 2. Psychosocial Characteristics of Depressed and Nondepressed Patients With Rheumatoid Arthritis

Variable	Depressed Patients (N = 29)		Nondepressed Patients (N = 45)		Analysis of Group Difference	
	N	%	N	%	Fisher's exact test	p
Married	20	69.0	38	84.4		0.15
Low social class ^a	20	69.0	15	33.3		0.002
Close confiding relationship	13	44.8	27	60.0		0.24
Number experiencing severe event and/or marked difficulties						
Related to rheumatoid arthritis	21	72.4	21	46.7		0.03
Independent of rheumatoid arthritis	16	55.2	14	31.1		0.053
	<i>Median</i>	<i>Interquartile Range</i>	<i>Median</i>	<i>Interquartile Range</i>	<i>Mann-Whitney U</i>	<i>p</i>
Social difficulties score ^b						
Related to rheumatoid arthritis	3	1–4	1	0–3	401.5	0.004
Independent of rheumatoid arthritis	2	0–4	0	0–2	438.5	0.009

^aSocial class is graded (range = 1–36) according to occupation by using the criteria of Goldthorpe and Hope (21). In this classification, subjects in the professions are allocated low numbers, and unskilled manual workers are allocated high numbers.

^bLife Events and Difficulties Schedule (15).

TABLE 3. Comparison of Patients With Rheumatoid Arthritis, Dependent on and Independent of Illness Variables, Across Levels of Depression

Relation to Rheumatoid Arthritis	Social Difficulties Score ^a					
	Nondepressed Patients (N = 45)		Borderline Depressed Patients (N = 10)		Depressed Patients (N = 19)	
	Median	Interquartile Range	Median	Interquartile Range	Median	Interquartile Range
Related	1	0–3	3	1–3.25	3	1–4
Independent	0	0–2	0	0–1.5	3	1–5

^aLife Events and Difficulties Schedule (15)

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factors associated with depression score found social variables to be independently associated with depression.^{12-14,26} To our knowledge, no previous study, however, has made such strenuous efforts to identify social stresses that are both independent of arthritis and independent of depression. The independent measurement of social stress is important, as previous cross-sectional correlations might simply reflect the fact that patients with greater psychological distress may view their social support and their spouses' behavior in a negative light.¹⁴ One other study has measured social stress independent of rheumatoid arthritis and found that depression (on a 10-point scale) was significantly related to interpersonal conflict events.²⁷

Our results partially support Rimon's assertion²⁸ that disabling arthritis alone may lead to depressive symptoms, but definite depressive disorders, as defined by psychiatric classification, appear to result from a combination of chronic social difficulties resulting from rheumatoid arthritis plus independent social stresses.²⁹ A prospective study using the same instruments is needed to clarify these relationships.

The clinical implications of this work are twofold. First, rheumatologists are well advised to identify anxiety

and depression in their patients because they are common (39.2% of our group had definite symptoms of depression). Second, clinicians should determine whether such psychiatric symptoms can be attributed solely to the way arthritis affects a person's life or whether there are independent social stresses (such as illness in the family, serious marital or family difficulties, or housing/financial problems) that also contribute. Help with the disability arising from rheumatoid arthritis and assistance with coping should benefit those who have adequate social support and do not have independent social stress. The remaining depressed patients with rheumatoid arthritis will probably require additional psychological treatment (e.g., cognitive behavior therapy and/or antidepressants), together with social help. Recognition of these different groups should lead to more appropriate and specific treatment of depression in rheumatoid arthritis, which may improve pain and disability as well as depressed mood.³⁰

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