British Journal of Rheumatology 1996;35:879–883

PREVALENCE OF SELF-REPORTED DEPRESSION IN PATIENTS WITH RHEUMATOID ARTHRITIS

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SUMMARY

The prevalence of self-reported depressive symptoms was investigated in a case–control study of patients with rheumatoid arthritis (RA) attending an out-patient clinic at the Middlesex Hospital. Patients selected their own controls, matched for age and sex. Previous attempts to measure depressive symptoms in RA have suffered from measurement error due to criterion contamination, where psychological symptoms augment depressive scores. A total of 163 patients (77% of the sample) and 115 matched pairs completed the Hospital Anxiety and Depression Scale (HADS). The results indicated that RA patients are more depressed and anxious than controls. The prevalence of depression above the cut-point was 15%. This figure is comparable to other reports adjusted for criterion contamination, but is lower than that of other studies which employ 'contaminated' tools. The depression scale of the HADS appeared to be relatively free of criterion contamination. Subject to further reliability testing, the HADS may be a practical screening tool for practitioners to assess patients in need of psychological interventions.

KEY WORDS: Depression, Rheumatoid arthritis, Criterion contamination.

THIS study stems from the recognition that although depression plays a major role in rheumatoid arthritis (RA), it is poorly measured. Most self-report measurements of depression are affected by items that elicit a response due to symptoms associated with the disease rather than emotional distress. Hence, causal relationships between emotional states and prognosis in RA remain unknown, and even prevalence information about these states is not reliable.

Adjusting to physiological conditions such as RA is sometimes accompanied by psychological disturbance, of which depression is the most common [1]. The need to diagnose and treat those patients who experience depression is now widely accepted, since it has been demonstrated that depression can increase disability [2–4], interfere with optimal treatment [5], and result in poor medical adherence and misutilization of health services [6, 7].

Certain depressive symptoms may express themselves through somatization, which resembles symptoms associated with arthritis. These symptoms include fatigue, difficulty in performing everyday activities, listlessness, loss of appetite and sleep disturbances. This can cause both the physician and the patient to assume that a change in the medical regimen is necessary, which may result in the prescription of higher doses of medication than are necessary to control the disease. Furthermore, increased self-report of pain has been associated with depression. In fact, cognitive aspects have been pinpointed by researchers as a possible explanation for pain and disability in the absence of further injury or after healing [8–10].

It is not just the possible misinterpretation of bodily sensations as pain that characterizes depression. Depression, even in the absence of other health problems, is associated with severe functional decline [11]. It has been found, for example, that depressed patients report more days in bed than many other patients with chronic disease, and when depression is combined with a major chronic disorder, the effects on disability are additive [2]. In patients with RA, a 4 yr prospective study found that those patients who were depressed spent 5.8 more days in bed per month than non-depressed patients [12]. The depressed group also contained fewer people in employment, regardless of physical disability. Of great importance to health services was the finding that the patients with depressed symptoms reported significantly more visits related to their RA to GP surgeries over the 4 yr period and more hospitalizations similarly related.

These findings suggest that clinicians treating patients with RA must be alert to the possible presence of depression. Because of the degree of training they require and the time demands, psychiatric interviews and subsequent diagnosis can only be employed as second-stage tools, after clinicians have used a more general, cheap and rapid screening measurement. For this reason, self-report measurements of depression are usually employed in medical settings.

Almost all such tools present a list of symptoms or behaviours to the patients who can indicate if, and to what extent, they have experienced each item. Several such tools have been used to assess the prevalence of self-reported depression in RA patients. Many of these measurements suffer from 'criterion contamination', which occurs when certain items which are meant to assess depression 'tap' into symptoms which result from RA. Such items will inflate the depression score in patients with RA erroneously, as they measure physiological symptoms which often occur in the disease rather than emotional states.

Submitted 2 November 1995; revised version accepted 18 March 1996.

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TABLE I
Prevalence of depression in patients with RA from self-report measurements

Reference	n	Measurement	% depressed above cut-point
Katz and Yellin [12]	822 out-patients	GDS (−3 items)	15–17*
Zaphiropoulos and Burry [17]	50 in-patients	BDI	46
Gardiner [18]	129 in-patients	GHQ	53
Bishop *et al.* [19]	39 in-patients	BDI	19*
Chandarana *et al.* [20]	86 out-patients	HADS	28
Hawley and Wolfe [21]	1152 out-patients	AIMS	20–34
Blalock *et al.* [14]	495 out-patients	CES-D (−4 items)	30–40*

*Attempted to adjust for criterion contamination.

Several studies have investigated the phenomenon of criterion contamination in depression measurements in RA. Evidence suggests that certain items were highly contaminated by measures of pain and disability, and inclusion of these items reflected disease severity rather than depression [13–15]. Criterion contamination may explain the variability in the reported prevalence of depression in RA (see Table I). A review of published results from self-reported measurements reveals great discrepancies in estimated prevalence, ranging from 20 to 80% [16].

Although it is likely that RA patients are more depressed than healthy populations, the risk ratio associated with having the disease is not known. Most studies are seriously flawed by their use of contaminated measurements. Until better instruments are utilized for the measurement of depression in physically impaired groups, research cannot begin to assess interventions or adjust treatment to patients' needs.

A simple, easy and reliable generic self-report tool is the Hospital Anxiety and Depression Scale (HADS; [22]). The HADS was developed specifically for use with patients from a range of medical conditions and should be relatively free of criterion contamination by somatic items. The current study explores the degree of criterion contamination in the HADS by carrying out comparisons between RA patients and controls on each item. The study aims to investigate the percentage of RA patients above the cut-point for depression on the HADS, compared to controls matched for age, sex and environment, in a case–control study carried out with RA patients in a rheumatology out-patient clinic at the Middlesex Hospital.

METHOD

Subject selection and characteristics

The rheumatology out-patient clinic at the Middlesex Hospital has ~350 RA patients on its routine follow-up files. The only reasons to be taken off the follow-up programme are death or moving away, and the minimum period between appointments is 12 months. A total of 210 of the patients who had visited the clinic in the 12 months previous to April 1995 were selected for participation in the study. Of these, around 50% had attended the clinic in the past 3 months. Approximately 75% of these patients were rheumatoid factor positive.

Subjects were posted a covering letter and a copy of the questionnaire, consisting of the HADS, questions about the duration of RA, the sites affected, and the degree of pain they were in regularly [23] and at the time of completing the questionnaire on a scale of 1–101. They were also asked whether they had another major disease, whether they worked and, if not, why not.

Subjects were also posted another copy of the questionnaire minus details about RA to give to a friend. This copy was colour coded, and the covering letter emphasized that the friend should be of similar age and same sex, but must not have RA. The aim of selecting controls in this way was to attempt to match for socioeconomic and environmental factors.

The information sheet attached to both questionnaires stated: 'We are conducting research on how people cope with rheumatoid arthritis so we can develop the most effective ways of helping people'. Patients were told: 'Please select a friend who is of a similar age and sex but does not have rheumatoid arthritis and hand them the pink questionnaire'. Instructions emphasized that the questionnaires were to be completed individually, without consulting other people.

The study was approved by the ethics committee at the Middlesex Hospital. The first questionnaires were posted in April 1995. A total of 118 (55%) were returned by patients with 87 completed pairs. Follow-up letters, with new copies of both questionnaires, were posted out in May 1995. Response rates increased to 163 (77%) completed patient questionnaires and 128 (61%) controls.

Statistics

The tests used included χ^2 tests on categorical data, unrelated *t*-tests, Mann–Whitney tests, Levene's test for equality of variance, analysis of variance with covariance and unconditional logistic regression. The statistical packages used were STATA and SPSS for Windows.

RESULTS

Description of cases and controls

The majority of patients with RA reported having the disease for >10 yr (66%), or between 5 and 10 yr (26%). Patients with RA were significantly less likely to be employed than controls. Of the patients below retirement age who were free of any other major disease, 17 (10%) reported they were not working principally because of health reasons. Unconditional logistic regression revealed that depression and case status were significantly related to work status after adjustment for age ($P < 0.01$).

TABLE II
Group characteristics

	Cases	Controls
N	163	128
% females	72	73
Mean age (S.D.)	61.2 (13.7)	56.6 (13.4)*
Pain at time scale: 1–100	38.7 (30.5)	N/A
Weekly pain scale: 1–100	45.6 (30.3)	N/A
% not working	70	45†
% with other major disease	29	13*

*$P < 0.01$.
†$P < 0.001$.

Of the patients with RA, 48 reported having another major disease (Table II). Of these, nine had asthma, six had cancer of various types including breast and kidney, five had cardiovascular disease, four had diabetes and 24 had a variety of disorders, of which the most common was osteoporosis. In the control group, 17 people reported suffering from a major disease, of whom three had asthma, two had cancer (breast and prostate), five had CVD, one had diabetes and six reported other complaints.

Comparing sex within cases

As expected, mean scores on anxiety and depression for females were consistently higher than those for males. However, the comparison between the sexes for the HADS scores shows that the difference was not significant. For anxiety, a one-way analysis of variance, with age as a covariant, approached significance ($P = 0.076$), but for the depression scale the covariance of age proved significant ($P = 0.026$) and no main effect was found between the sexes ($P = 0.12$). No sex difference was found for reported weekly levels of pain ($P = 0.17$). Age was not significant as a covariant in any but the HADS depression comparison.

Criterion contamination analysis

To investigate criterion contamination in the HADS, a rheumatologist was consulted and asked to indicate which items he regarded as being closely linked with disease status. D1 ('I enjoy things as much as I used to'), D4 ('I feel as if I am slowed down') and A4 ('I can relax and sit at ease') were considered the most likely to be contaminated. A comparison between patients and controls was then carried out on each item using a Mann–Whitney test. In the anxiety scale, only two items (A1 and A4) differed significantly between patients and controls. On the other hand, all comparisons in the depression scale, apart from D7, revealed a significantly higher score for the patients (D1, 2, 4 and 5 at $P < 0.01$, and D3 and 5 at $P < 0.05$). Analysis on the total depression, computed without items 1 and 4, showed that patients were significantly more depressed than controls ($P < 0.001$, mean rank is 158 for patients and 125 for controls).

Comparisons between cases and controls on the HADS

The mean responses on the HADS scores were compared between cases ($n = 163$) and controls ($n = 124$, four questionnaires were rejected because of missing data) (Table III). All tests indicate that patients scored significantly higher on HADS anxiety ($P = 0.01$) and HADS depression ($P = 0.001$).

TABLE III
Means (S.D.) for HADS in cases and controls

	Cases	Controls
HADS anxiety	8.13 (4.8)	6.71 (3.9)
HADS depression	6.22 (3.8)	3.78 (2.9)

The authors of the HADS have suggested a score of 8+ as being indicative of a possible clinical state (e.g. a state in which a patient may be diagnosed as suffering from an emotional disorder) and a score of 11+ as being indicative of a probable clinical state for both anxiety and depression. The higher cut-point was selected for both subscales of the HADS, and cases and controls re-classified as positive and negative depression and anxiety status according to their scores. Odd ratios (OR) for anxiety and depression status between cases and controls were calculated, with 95% confidence intervals (CI). Patients with RA were 4-fold more likely to be anxious than controls (OR = 4.47, 95% CI = 3.14–8.22) and twice as likely to be depressed (OR = 1.95, 95% CI = 1.27–2.97).

Unconditional logistic regression on depression status revealed that case status significantly predicted depression (OR = 2.09, $P = 0.008$) when adjusted for age and sex. For anxiety status, however, both case status and sex proved to be independent predictors (OR for sex = 0.59 M/F, $P = 0.015$; OR for cases/controls = 1.35, $P = 0.045$), but the interaction between the two was not significant ($P = 0.33$). Age did not improve the model significantly. Unconditional logistic regression within the RA patients revealed that pain level was significantly related to depression status ($\beta = 0.77$, $P = 0.001$, pain coded in quarters; $P = 0.002$ as continuous trend) when adjusted for sex and age, neither of which improved the model significantly (Table IV).

The percentage of patients with RA who report depression symptoms above the cut-point of 11 on the HADS was compared to that reported by the largest study to date measuring depression in patients with RA. Hawley and Wolfe [21] reported 20% of their USA-based sample ($n = 1152$) to be above a cut-point on the AIMS questionnaire. The OR between this sample and ours is 1.68, with a 95% CI of 1.49–1.88.

TABLE IV
Depression status and level of pain in cases ($n = 157$, six missing)

	Depression+	Depression−
Pain <25	3	72
Pain 25–50	1	29
Pain 50–75	5	18
Pain >75	8	21

DISCUSSION

This study estimated the prevalence of depression in patients with RA, defined as those who score >11 on the HADS, compared to controls selected by patients, matched for sex and age, and compared to a large USA RA patient sample. The main focus of the investigation was to obtain a prevalence estimate using a measure free from criterion contamination due to somatic items that confuse symptoms of RA with those of depression.

When the HADS scores were treated as continuous variables, patients with RA consistently scored higher than controls. A better estimate for increased risk of depression in RA compared to the control group is the regression analysis coefficient, which adjusts for age and sex (OR = 2.09). We therefore conclude that the patients in our sample report higher levels of depression and anxiety than controls.

We found that depression status was related significantly to pain intensity in patients with RA. The implications of this may be a loop or vicious circle effect, whereby pain leads to depression, and depression in turn augments pain distress and affects monitoring and interpretation of pain signals (reviewed in Pincus *et al.* [24]). It is also possible that a third factor, such as coping or self-concept, affects both depression and pain processing. Exploring this area further is essential to maximize the success of psychological interventions in patients with RA.

A large USA population-based sample [21] reported that the prevalence of depression in RA was around 20%. Our sample reported significantly fewer cases (15%) above the depression cut-point. This may be explained by our choice of cut-point (several other studies have used the less stringent 8+ on the HADS). Indeed, when we repeated our analysis using 8+ as the cut-point, the OR increased to 4.4, with 23% of the patients classified as depressed, compared to 6% of the controls. It is also possible that the measurement used in the USA study (the AIMS) suffers from criterion contamination and its use results in over-reporting of depression by inclusion of physiological RA-related symptoms as depression related. Although the two studies used different tools to assess depression, a comparison between prevalence rates should be possible, providing both measures are reliable. The age and sex make-up of the two groups was similar, but it is possible that ethnic and cultural differences between the groups contribute to the observed difference in reported depression. However, it should be noted that our prevalence rate was identical to that reported by Katz and Yelin [12] on a group of 822 out-patients in a study that attempted to control for criterion contamination by removing certain items from a depression questionnaire.

Our findings may have been compromised by a selection bias, both in cases and controls. Our response rate from all cases (>77%) seems satisfactory, and the criteria for follow-up at the clinic, where loss can only be attributed to death or moving, imply that it is unlikely that we have a sample that is more likely to be followed up because it is more distressed. There is, however, a possibility that our study underestimated the prevalence of depression in RA patients in general, as our patients were under constant medical care and were able to get themselves to an out-patient clinic. Although it seems unlikely that our results can be generalized to in-patients, the sample of patients with RA is probably representative of British inner-city populations. Generalizing the findings to other populations, such as patients with RA living outside major cities, should be done with caution due to the possible confounding effect of environmental stress.

It is impossible to eliminate the possibility of a selection bias in the control sample. Patients may have selected friends whom they judged to be more similar to themselves in terms of emotional states, which would reduce the effect, or they may have selected the most healthy and out-going amongst their friends, which would amplify the effect. There is some suggestion in our data for a selection bias towards healthier controls, as our patients with RA suffered from significantly more major illnesses apart from RA. However, other explanations, such as a detection bias in patients due to hospital follow-up, may account for this difference. The prevalence of depression in our control group (3.3% scored 11+ on the HADS) is lower than that reported for British adults of a similar age range [25]. The OPCS report on the prevalence of psychiatric morbidity in non-institutionalized adults estimates the prevalence of depression at around 9% (across sexes) for the age range 50–64 ($n = 2375$). It is likely that the OPCS cut-point corresponded better with the 8+ cut point on the HADS which indicates possible depression.

Finally, the question of criterion contamination on the HADS must be addressed by future research. Our study showed that patients scored consistently higher on all items in the depression scale apart from D7. If the elevation in depression scores was due primarily to one or two items that measured disease status, differences between cases and controls would be limited to those items only. In contrast, we found that patients scored higher than controls on all but one item in the depression scale. We interpret this to mean that their self-reported depression scores are not just an artefact of their disease status. The anxiety scale, on the other hand, showed a difference between patients and controls only on two items, of which one was indicated as a possible contaminator by a rheumatologist. Although this suggests that the HADS depression scale is comparatively reliable, further tests should include a comparison with interview scores and behavioural measurements.

CONCLUSION

Depression is increased significantly in patients with RA compared to non-RA controls. It is related both to pain levels and to work status. The prevalence of self-reported depressive symptoms found in this case–control study was around 15%. This prevalence rate is lower than that previously reported in similar

groups. This may be a result of sample size, but may in fact be a better indication of the true state of affairs as the current study used non-contaminated measurements to assess depression. Future research should concentrate on validating measures of emotional distress in larger samples and relating the scores on them to disease-related variables.

ACKNOWLEDGEMENTS

The authors wish to thank the MRC for their support of this study. Special thanks also to Dr Tony Johnson, Dr David Scott and Jonathan Pincus for their assistance. Finally, we wish to thank the patients who took the time and effort to complete our questionnaires.

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