Assessment of Depression, Anxiety, Stress, and quality of life in rheumatoid arthritis patients and comparison with healthy individuals

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Background: Rheumatoid arthritis (RA) is a disabling condition that results in considerable suffering and negatively impacts an individual’s psychological, financial, social, and quality of life (QoL). Pain, fatigue, and disabilities, which may be considered as stress factors, are common challenges that may subsequently lead to psychological distress. Aim: Assessment of Depression, Anxiety, Stress, and QoL in RA patients and Comparison with healthy individuals. Materials and Methods: This cross-sectional analytical study included 50 RA patients who have reported to a tertiary health care center on outpatient basis and an equal number of age- and sex-matched healthy individuals. The study was conducted after obtaining Institutional Ethics Committee approval and informed consent of the participants. Patients were assessed based on Disease Activity Score incorporating erythrocyte sedimentation rates, Depression Anxiety Stress Scale (DAS21), Health Assessment questionnaire, Visual Analog Scale, and Multidimensional scale of Perceived Social Support. Results: Levels of anxiety, depression, and stress in patients with RA were significantly higher as compared to age- and sex-matched healthy controls. RA patients had significantly lower scores on total social support, as well as social support of family and friends. However, there was no difference between RA patients and healthy controls on social support from significant others. Conclusion: Patients with RA had significantly higher levels of anxiety, depression, and stress and significantly lower levels of social support compared to age- and sex-matched healthy controls. The therapeutic implications of these findings need further evaluation.

Keywords: Anxiety, depression, rheumatoid arthritis, stress
magnetic resonance imaging (MRI), counting tender/swollen joints, blood tests for acute-phase reactants, and the quantification of morning stiffness or pain. Functional impairment refers to diminished ability to perform activities of daily living, employment, and other tasks. Most RA patients show some functional impairment not explained by age alone. Measures of physical damage reflect the irreversible physiological effects of RA itself or iatrogenic sequelae of treatment, by assessing cumulative scarring, destruction, and deformity of joints and underlying bone. The most complete method of measuring RA severity is based on American College of Rheumatology standards and involves clinical assessment (history and physical examination), laboratory tests (e.g., ESR), and imaging procedures (e.g., X-rays and MRI).

RA has a chronic and progressive course with a profound psychosocial and economic impact. The assessment of its severity is extremely important for monitoring the clinical course of the disease; gauging the effectiveness of medical, pharmaceutical, and behavioral interventions; and quantifying the impact of pathophysiological and biopsychosocial correlates. Pain is often a central part of RA, with the majority of RA patients experiencing chronic pain. Chronic pain is a disabling condition that results in considerable suffering and negatively impacts an individual's psychological, financial, social, and finally quality of life (QoL). Studies examining cognitive behavioral interventions among the RA population have been encouraging in improving treatment effects. However, management of chronic pain can be complex even when the disease is well controlled and residual pain that often triggers psychological problems.

The increased prevalence of anxiety disorder in patients with chronic illnesses is well known. Several autoimmune diseases have been shown to be associated with higher rates of anxiety. More specifically, studies have investigated the comorbidity trends between RA and anxiety. Monitoring mental health status in RA patients is of central importance for improving pain management, disease treatment response, and patient's QoL. In the present study, we considered three of the more common assessments, i.e. disease activity, QoL, and psychiatric morbidity and compared it with healthy controls.

**MATERIALS AND METHODS**

This cross-sectional analytical study was conducted in the Department of Medicine (Rheumatology Clinic) and Department of Psychiatry in a tertiary care center. After obtaining permission from the institutional Ethics Committee (vide I.E.S.C./121/2019 date 16/07/2019), the study was started. Written informed consent was obtained from every case and control.

**Sample**

By purposive sampling, all patients attending rheumatology outpatient clinic who had been diagnosed with RA were taken as cases and age- and sex-matched individual as control group who had given informed written consent for the study.

**Inclusion criteria**

- All RA patients who were attending the rheumatology outpatient clinic were taken as cases
- Age- and sex-matched individual with no chronic medical or psychiatric disorder as control group
- Subjects willing to give written informed consent.

**Exclusion criteria**

- Other medical/psychiatric illness which prevents the subjects from cooperating or participating in the study.

**Tools**

**Sociodemographic and clinical pro forma**

To record demographic information and the clinical profile, a specifically prepared pro forma was employed.

**Disease activity score-28 incorporating erythrocyte sedimentation rate**

During clinical decision-making, the 28-joint disease activity score with ESR (DAS28-ESR) is commonly used as a marker of inflammatory disease activity in patients with RA. DAS28-ESR 3.2 can be used as a threshold for determining whether or not someone has active RA, and DAS28 is frequently utilized in clinical studies or as a therapeutic goal. These techniques have been shown to be effective as outcome measurements in patients with RA. Noninflammatory processes can make it difficult to interpret DAS28-ESR 3.2 as a marker of active inflammation because of their impact on pain. Swollen joint count and ESR are inflammatory indicators. Tender joint counts may, however, be higher in persons who have centrally enhanced pain.

**Visual Analog Scale**

Instruct the patient to indicate how much pain they are now experiencing by pointing to a place on the line between their faces. The far-left end denotes “no pain,” whereas the far-right end denotes the most excruciating suffering ever.

**Health Assessment Questionnaire-Disability**

Self-report assessments of function in individuals with rheumatic illnesses include the Health Assessment Questionnaire (HAQ)-disability and pain scales. Dressing, arising, eating, walking, hygiene, reach, grasp, and common activities are the eight criteria used to measure disability.
The HAQ has shown to be a dependable tool for predicting many aspects of a patient’s eventual illness history.\cite{14}

**Depression Anxiety Stress scale (DASS-21)**

The Depression Anxiety Stress scale (DASS-21) is a self-report assessment of anxiety, depression, and stress. Each of the subscales contains seven items, giving a total of 21 questions.\cite{15}

**Multidimensional scale of perceived social support**

A measure of how much family, friends, and significant others assist a patient. The sum of all 12 elements is then divided by 12 to get the overall score. Low support is defined as a score of 1–2.9; moderate support is defined as a score of 3–5; and strong support is defined as a score of 5.1–7. It is a critical component of effective caregiver intervention.\cite{16}

**Methods**

The patients with confirmed diagnosis of RA attending the rheumatology clinic and equal number of age- and sex-matched controls were approached for participating in the study. After explaining the aims and objectives of the study, a written informed consent was obtained. With the help of the rheumatologist, DASS28-ESR scale was applied on the patients. The visual analog scale (VAS) response was marked by the RA patients themselves followed by the HAQ-Disability. Thereafter, the DASS-21 and the Multidimensional Scale of Perceived Social Support were administered to patients and control subjects.

**Statistical analysis**

The data were analyzed utilizing the Statistical Package for the Social Sciences version 17.0 (SPSS, IBM, Chicago, USA) with a significance threshold of 0.05. Frequency data were compared using Chi-square test, continuous data using the Student’s *t*-test, and ordinal data by Mann–Whitney test. A multiple regression analysis by stepwise method was run to determine the predictors of depression in RA patients.

**RESULTS**

Sociodemographic-related characteristics of both RA and control subjects were matched for age, sex, marital status, and domicile. Mean age of RA and controls was 45.12 with standard deviation (SD) 11.85 and 44.16 with a SD of 10.55, respectively [Table 1]. Table 2 shows the DAS28-ESR – Disease activity score incorporating erythrocyte sedimentation rates; VAS for pain, and Health of RA patients. Table 3 shows the scores for depression, anxiety, stress, and QoL in RA patients and healthy controls and the multidimensional Scale of Perceived Social Support, Scale. A multiple regression was run to predict depression in RA patients from social support (family) and sex. All the variables were statistically significant and predicted preoperative depression, F (2, 47) = 32.269, P < 0.000, R² = 0.581. Both variables were statistically significant to the prediction, P < 0.05 [Tables 4-6].

**DISCUSSION**

RA is a multifactorial, chronic, and inflammatory disease affecting primarily the joints with prevalence of 0.5%–1%.
Pain, fatigue, and disability observed in the RA patients may be considered as stress factors and are common challenges that may subsequently lead to psychological distress. The depression scores on DASS 21 were significantly more in the patients with RA [Table 3]. In previous studies of RA patients, depression and anxiety rates were found to range from 14% to 46% and 20%–70%, respectively, which is in conformity with the findings of the present study. Low educational level has been linked to depression and anxiety in RA patients, according to an earlier study. Therefore, the poor educational level of our patients might be a contributory factor for the increased frequency of anxiety and depression in the RA group in the present study. Low socioeconomic status is linked to poor health in both healthy people and people with RA.

Anxiety has been largely ignored in RA. Recent prospective, longitudinal community research indicates that anxiety disorders are frequently comorbid disorders in RA. RA symptoms can change dramatically over the course of a single day or over extended periods of time, which can lead to anxiety feelings. Further, unpredictability in disease progression, persistent pain, and mobility

Table 3: Assessment of depression, anxiety, stress, and quality of life in rheumatoid arthritis patients and healthy controls

| Scales                     | RA patients | Control subjects | Mann-Whitney U test | P      |
|----------------------------|-------------|------------------|---------------------|--------|
| DASS 21 (depression)       |             |                  |                     |        |
| Mean                       | 8.72        | 3.84             | 158.000             | <0.001 (S) |
| SD                         | 3.65        | 1.49             |                     |        |
| Depression severity (distribution) |         |                  |                     |        |
| Mild                       | 6           | 0                | Fishers exact test  | 1 (NS) |
| Moderate                   | 5           | 0                |                     |        |
| DASS 21 (anxiety)          |             |                  |                     |        |
| Mean                       | 8.16        | 3.92             | 267.000             | <0.001 (S) |
| SD                         | 3.54        | 1.55             |                     |        |
| Anxiety severity (distribution) |         |                  |                     |        |
| Mild                       | 11          | 0                | Fishers exact test  | 1 (NS) |
| Moderate                   | 10          | 0                |                     |        |
| Severe                     | 2           | 0                |                     |        |
| DASS 21 (stress)           |             |                  |                     |        |
| Mean                       | 14.08       | 3.88             | 511.000             | <0.001 (S) |
| SD                         | 4.08        | 0.04             |                     |        |
| Stress severity (distribution) |         |                  |                     |        |
| Mild                       | 9           | 5                | Fishers exact test  | 0.256 (NS) |
| Moderate                   | 5           | 0                |                     |        |
| Social support             |             |                  |                     |        |
| Mean                       | 4.90        | 5.52             | 922.000             | <0.023 (S) |
| SD                         | 0.72        | 0.99             |                     |        |
| Social support distribution|             |                  |                     |        |
| Low support                | 4           | 4                | $\chi^2$: 8.788     | 0.012 (S) |
| Moderate support           | 26          | 12               |                     |        |
| High support               | 10          | 34               |                     |        |
| SS Fam                     |             |                  |                     |        |
| Mean                       | 6.32        | 6.64             | 851.000             | <0.003 (S) |
| SD                         | 0.79        | 0.73             |                     |        |
| Social support (friends)   |             |                  |                     |        |
| Mean                       | 6.19        | 6.48             | 761.000             | <0.001 (S) |
| SD                         | 1.46        | 0.86             |                     |        |
| Social support (significant other) |         |                  |                     |        |
| Mean                       | 5.21        | 3.28             | 1016.000            | <0.106 (NS) |
| SD                         | 2.10        | 1.93             |                     |        |

RA – Rheumatoid arthritis; NS – Not significant; SD – Standard deviation; DASS – Depression Anxiety Stress Scale; S – Significant; SS Fam – Social support (family)

Table 4: Multiple regression analysis to find out predictors of depression in rheumatoid arthritis patients: Model summary

| Model | $R$  | $R^2$ | Adjusted $R^2$ | SE of the estimate | Durbin-Watson |
|-------|------|-------|-----------------|--------------------|---------------|
| 2     | 0.762 | 0.581 | 0.563          | 2.43523            | 2.314         |

Predictors: Constant, SS Fam, Sex, *Dependent variable: DASS depression. DASS – Depression Anxiety Stress Scale; SE – Standard error; SS Fam – Social support (family)
Khan, *et al.*: Depression, Anxiety, Stress, and quality of life in rheumatoid arthritis patients

### Table 5: Multiple regression analysis to find out predictors of depression in rheumatoid arthritis patients: ANOVA*

| Model  | Sum of squares | df | Mean square | F     | Significant |
|--------|----------------|----|-------------|-------|-------------|
| Regression | 379.936 | 2  | 189.968 | 32.569 | 0.001* |
| Residual  | 274.144 | 47 | 5.833  |       |             |
| Total    | 654.080 | 49 |          |       |             |

*Dependent variable: DASS depression, *Predictors: Constant, SS Fam, sex. DASS – Depression Anxiety Stress Scale; SS Fam – Social support (family).

### Table 6: Multiple regression analysis to find out predictors of depression in rheumatoid arthritis patients: Coefficients*

| Model  | Unstandardized coefficients | Standardized coefficients (β) | t     | Significant | 95.0% CI for B (lower bound-upper bound) | Collinearity statistics |
|--------|-----------------------------|--------------------------------|-------|-------------|---------------------------------------|-------------------------|
|        | B SE                         |                                |       |             |                                       | Tolerance               |
| Constant | 28.220                     | 2.863                          | 9.857 | 0.000       | 22.461–33.979                         | 1.000                   |
| SS Fam | −3.362                     | 0.433                          | −7.766 | 0.000       | −4.232–−2.491                         | 1.000                   |
| Sex    | 2.078                      | 0.932                          | 2.230 | 0.031       | −0.203–3.552                          | 1.000                   |

*Dependent variable: DASS depression scores. CI – Confidence interval; DASS – Depression Anxiety Stress Scale; SS Fam – Social support (family); SE – Standard error

restrictions might all raise the risk of clinically severe emotional states such as anxiety.[23] In one of the studies, over one-third of Japanese women with RA exhibited significantly higher anxiety levels on the State-Trait Anxiety Inventory.[24] Similarly, in our study, RA patients showed significantly higher levels of anxiety as compared to the controls [Table 3].

People with RA, like those dealing with other chronic illnesses, appear to benefit from having a network of connections on whom they may rely for emotional support, knowledge, and physical help. Patients with RA who report receiving greater social support have been found to have improved every day and role functioning, as well as a better mood, self-esteem, and psychological well-being.[25] This is consistent with the findings in our study. The results of the regression analysis in the present study also indicate that social support (family) is a negative predictor of depression [Tables 4-6]. Similarly, a longitudinal study of 139 people with RA revealed that social relationship scores were just as strongly linked to depressed mood as illness and disability factors across time.[26] After adjusting for the relevant factors, research in the Netherlands found that stronger emotional support and lower pain were the only variables independently linked with lower levels of psychological distress in RA patients.[27]

**Limitations**

Since this is hospital-based study, it may not be applicable to the broader public or patients with RA. The cause-and-effect relationship between related variables could not be determined because this was a cross-sectional study. A long term observational study with a larger sample may provide additional information.

**CONCLUSION**

Patients with RA had significantly higher levels of anxiety, depression, and stress and significantly lower levels of social support compared to age- and sex-matched healthy controls. The therapeutic implications of these findings need further detailed evaluation.

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**Conflicts of interest**

There are no conflicts of interest.

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