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Original Research Article

Association of depression in rheumatoid arthritis: a single centre experience

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ABSTRACT

Background: To identify clinically important predictors of Rheumatoid Arthritis (RA) associated self-reported depression (SRD) in Eastern India.
Methods: A questionnaire-based study was conducted among adult RA patients attending Rheumatology clinic at KPC Medical College and Hospital, Kolkata between 1st January 2016 to 31st December 2016.
Results: A total of 246 questionnaires were returned (responder rate: 64.9%). 180 (47.49%) completed pairs were selected and were subsequently analyzed. Most RA patients had disease >5 years (61%), belonged to rural background (>50%) and middle-income group (43.3%). 89 patients (49.4%) reported having another major disease. Nearly 13% (working age group) claimed to be unemployed due to 'health reasons.' Unconditional logistic regression revealed that SRD was also related to work status ($p < 0.01$). The prevalence of depression in RA group 21% (95% CI 15.5-26.9%), which was significantly higher ($p < 0.01$) compared to non-RA cohort (8%; 95% CI 4-11.9). The mean score of SRD were consistently higher in females with RA ($p < 0.01$). Treatment-naïve patients had higher incidence of depression compared to patients on >3 months of DMARDs (38% versus 17%; $p < 0.05$). Moreover, SRD was higher in presence of co-morbidities, highest being in cancer (HR: 2.39, 95% CI 1.41-4.18), followed by chronic renal disease (HR: 2.26, 95% CI 1.05-4.12) and stroke (HR: 1.79, 95% CI 1.02-2.92).
Conclusions: Depression is significantly higher patients with early RA. Pain level and work status is related, and may implicate a vicious circle. Early psychiatric evaluation may improve pain scores in RA.

Keywords: Depression, Disability, Pain, Rheumatoid arthritis

INTRODUCTION

Depression is common in patients with Rheumatoid Arthritis (RA), with a prevalence of 13-42%.[1-7] Depression, though a treatable condition, has been linked to increased morbidity in RA, with an increase in pain levels, functional disability and cardiovascular mortality.[8-11] RA patients with concomitant depression have a 7.2% increase in medical expenditure as well.[12] The likelihood of mortality in such patients was also found to be doubled.[13] Variables like social disadvantage (lower education status, unmarried status, and low-income levels), female gender and chronic concomitant illness have been found contributory to the condition. Specific determinants to depressive illness in RA further include pain severity, functional loss and impact on daily activities.[14,15] Although, there are multitude of factors regarding RA and depressive illness described in western

studies, Indian data on the contribution and clinical relevance of such factors is missing. Therefore, the goal of this study was to identify clinically important predictors of self-reported depression. Our study is perhaps the first of its kind in Eastern India.

METHODS

The study was conducted in accordance with the Helsinki II declaration and protocol was approved by the Institutional Ethics Committee (IEC) at KPC Medical College and Hospital, Kolkata, India. Oral and written informed consent was obtained from all participants.

This observational study included all RA adult patients (age 18 to 70 years) attending Rheumatology out-patient clinic at the KPC Medical College and Hospital, Kolkata, between 1st January 2016 to 31st December 2016. Participation was voluntary.

Relevant socio-demographic details such as age, gender, average monthly income of the family and urbanization level of the subject's residential area were recorded. The monthly incomes were divided into 4 levels:

- Economically Weaker Section (EWS, monthly household income (MHI) upto Rs. 5000),
- Low income group (LIG; MHI between Rs. 5001 to Rs. 10,000),
- Middle income group (MIG; MHI between Rs. 10,001 to Rs. 20,000), and

High income group (HIG; MHI over Rs. 20,000). 'Urbanization' levels were divided into 2 strata based on population density and social facilities: urban and rural areas.

Questions relating to depression and mood included self-reported depression and the Medical Outcomes Study Short Form 36 (SF-36) mood and mental component summary (MCS) scales.[16] Self-reported depression by two questions, "Have you had a problem with depression in the last 6 months?" and "Are you taking any antidepressant medication?" Disability status and current work status (employed, unemployed, disabled or retired) were self-reported.

Questions related to RA severity included Health Assessment Questionnaire (HAQ) index, and Visual Analog Scale (VAS) for pain and Patient Activity Scale (PAS).[17,18] The PAS is formed by multiplying the HAQ score divided by 3.33 and then dividing the sum of the VAS pain, the VAS global, and the HAQ score by 3. This yields a 0-10 scale. The PAS is a composite patient measure of RA activity. Co-morbidity was assessed by a patient-reported composite co-morbidity score (range 0-9) comprising of 7 present or past co-morbid conditions like hypertension, stroke, cardiovascular disease, diabetes, chronic renal disease and cancer.[19] All study variables were evaluated on study entry and 3 monthly follow-ups.

Statistical analysis

Chi-square test was used to examine differences in demographic variables and disease characteristics between the RA group and control cohorts. Hazard regression analysis was done to compute the adjusted hazard ratio (HR) and 95% confidence interval (95% CI) of depression for RA group compared with the control cohort. The data were analyzed using the packages STATA and SPSS version 21 for windows.

RESULTS

A total of 246 questionnaires were returned (responder rate: 64.9%). 180 (47.49%) completed pairs selected and were subsequently analyzed. Most RA patients had disease > 5 years (61%), belonged to rural background (>50%) and middle-income group (43.3%). 89 patients (49.4%) reported having another major disease. Of these, 13 (7.2%) had asthma, 8 (4.4%) had cancer of various types including breast and kidney, 39 (21.6%) had cardiovascular disease, 42 (23.3%) had diabetes and 34 (18.8%) had a variety of disorders, of which the most common was osteoporosis. (Table 1) Nearly 13% (working age group) claimed to be unemployed due to 'health reasons.' Unconditional logistic regression revealed that SRD was also related to work status ($p < 0.01$). The prevalence of depression in RA group 21% (95% CI 15.5-26.9%), which was significantly higher ($p < 0.01$) compared to non-RA cohort (8%; 95% CI 4-11.9). The mean score of SRD were consistently higher in females with RA ($p < 0.01$).

Treatment-naïve patients had higher incidence of depression compared to patients on > 3 months of DMARDs (38% vs. 17%; $p<0.05$). Moreover, SRD was higher with co-morbidities such as hypertension, stroke, heart disease, diabetes, chronic renal disease and cancer ($p < 0.01$ for all conditions), highest being in cancer (HR: 2.39, 95% CI 1.41-4.18), followed by chronic renal disease (HR: 2.26, 95% CI 1.05-4.12) and stroke (HR: 1.79, 95% CI 1.02-2.92). (Table 2).

DISCUSSION

However, the prevalence of SRD mostly ranges between 13%-20%, in most studies, or can be as high as 50% in developing nations; however, the prevalence of depression varies widely in the literature depending upon the definition, psychometric tool used, method of ascertainment and setting.[20,21] Interestingly, though India is a developing nation, SRD prevalence of 21% from our centre, indicates that many patients with RA tend to remit SRD over the course of disease.

Table 1: Base line characteristics of the subjects in the study group.

Variable	RA (*n* =180)	Non RA (*n* =180)	[a]*P*
Demographics			
Age, mean ± SD (years)	45.7±15.5	47.2±19.4	<0.01
Female, n	153 (85)	142 (78.8)	0.546
Educational level, n (%)			
Primary school	94 (52.2)	89 (49.4)	0.646
Secondary school	55 (30.5)	62 (34.4)	
University	31 (17.2)	29 (16.1)	
Marital status, n (%)			
Single	41 (22.7)	49 (25.7)	0.671
Married	108 (60)	102 (56.6)	
Cohabitating	1 (0.5)	2 (1.1)	
Divorced	9 (5)	8 (4.4)	
Widowed	21 (11.67)	19 (10.5)	
Level of urbanization			
Urban	83 (46.1)	79 (43.8)	
Rural	97 (53.8)	101 (56.1)	
Income group, n (%)			
EWS	11 (6.1)	8 (4.4)	0.672
LIG	67 (37.2)	71 (39.4)	
MIG	78 (43.3)	79 (43.8)	
HIG	78 (43.3)	22 (12.2)	
Disabled (self-report), n (%)	11 (6.1)	(0)	
Psychological status			
SF-36 mood scale	71.3±18.2	52.3±16.2	<0.01
SF-36 MCS score	51.3±10.2	32.6±9.6	
Antidepressant use, %	19.8	6.3	
RA severity variables			
Global severity (0-10)	5.4±2.3	3.2±2.5	<0.01
Pain (0-10)	5.8±2.6	3.9±2.7	
HAQ-DI (0-3)	1.6±0.8	1.1±0.5	
PAS (0-10)	5.5±2.5	3.5±2.2	
Comorbidities			
Hypertension	32 (17.7)	17 (9.4)	<0.01
Stroke	9 (5)	0 (0)	<0.01
Diabetes	42 (23.3)	12 (6.7)	<0.01
Heart disease	39 (21.6)	13 (7.2)	<0.01
CKD	16 (8.8)	4 (2.2)	<0.01
Cancer	8 (4.4)	1 (0.6)	<0.01
DMARD usage			
Yes	109 (60.5)	0 (0)	
No	71 (39.4)	0 (0)	

Data expressed as n (%); SD, Standard deviation; EWS, Extremely Weaker Section; LIG, Low Income Group; MIG, Middle Income Group; HIG, High Income Group; CKD, Chronic Kidney Disease; NA, Not Applicable. Two-tailed P <0.05 considered statistically significant. aChi square test.

We also found that the prevalence was significantly higher in treatment-naïve RA population. Similar observation was made by Ludovic B et al in their study, in which it was reported that 46.9% of RA patients had psychological distress on index visit. They also reported that HAQ score was the most important factor predicting psychological distress, hence we decided to include the scale. Our study showed similar trends, as predictive factors for psychological stress in both studies included female gender, low educational level, low family income, high disease activity and poor functional status (high HAQ score).[22]

The mean score of depression were higher in female in our study (p <0.01), in accord with findings of Miao-Chiu Lin et al, who had revealed that females are 1.78-fold were more likely to suffer from depression.[23]

Table 2.0 Risk of depression in co-morbidities for RA patients versus non-RA controls.

Co-morbidity	Crude HR (95% CI)	Adjusted HR (95% CI)
Cancer		
No	1	1
Yes	2.29 (1.35-3.87)	2.39 (1.41-4.18)
Chronic kidney disease		
No	1	1
Yes	2.19 (1.04-3.89)	2.26 (1.05- 4.12)
Stroke		
No	1	1
Yes	1.65 (1.04-2.54)	1.79 (1.02- 2.92)
Diabetes		
No	1	1
Yes	1.17 (0.83-1.67)	1.14 (0.80 -1.64)
Heart disease		
No	1	1
Yes	1.09 (0.79-1.53)	1.03 (0.72 - 1.36)
Hypertension		
No	1	1
Yes	1.07 (0.85-1.33)	1.02 (0.77 - 1.24)

*The model was adjusted for age, gender, urbanization level, monthly income and medication usage

Although many factors contributed to SRD, the major findings in this study, however was that pain level, work status and co-morbidity were the important determinants. Moreover, pain severity and social dysfunction were related, which implicated a vicious circle, whereby one perpetuates another. Components like demography, male gender, marital status, education were found non-significant in analyzing predictive trends. This is in contrast to other studies, were depression has been found to be more in minorities.[24] We did not have enough minority subjects in the current study, to adequately investigate ethnicity.

Limitations of this study was (i) SRD is not a usual measure in research studies, but it is a reasonable one, representing patients' perceptions and depressive symptoms, and it is related to conventional measures of mood; (ii) prediction variables also include 'casual factors' like 'interpersonal relations', 'family vulnerability', 'traumatic experience', however we have presented a clinical model that is concerned with case identification, not causality.[25-27]

CONCLUSION

For subjective improvement of RA patients, need of psychological assessment and treatment of depression as an adjuvant management aid must be stressed upon. Future research should concentrate on validating measures of emotional distress in larger samples and relating the scores on them to disease-related variables.

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