Research article

Depression and its association with disease activity and quality of life in patients with rheumatoid arthritis at the Kenyatta National Hospital

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Abstract

Background: Rheumatoid arthritis is a systemic inflammatory disease that affects the synovial membrane, resulting in the structural damage of cartilage, bone and ligaments. The course of RA differs between patients, and its severity can range from self-limiting disease to severe destruction and systemic complications. RA affects patients physically, psychologically and socially. Patients experience pain, joint swelling, stiffness, functional limitations and fatigue and overall poor quality of life. In addition, they report anxiety and depressive symptoms and concerns about increased physical limitations. Experiencing psychological distress may inflate the subjective severity of patient-reported symptoms such as pain and tenderness. Furthermore, patients experience a loss of independence and restrictions in participation, i.e. a decrease in socializing which may in turn propagate symptoms of depression. An accurate description of the relationship between depression, disease severity and quality of life is necessary for our setting. If an interaction exists, then there is a group of vulnerable patients who could benefit from earlier identification of depression and the impact their disease has on HRQoL and appropriate management provided.

Objective: To determine the prevalence of depression and the relationship between depression, disease activity and quality of life in ambulatory patients with rheumatoid arthritis at the Kenyatta National Hospital.

Design: A descriptive-cross sectional study.

Methods: The study was carried out at the rheumatology clinic at the Kenyatta National Hospital. The study population included ambulatory patients with a diagnosis of rheumatoid arthritis who were above the age of 14 years. Seventy four patients with rheumatoid arthritis were studied. The PHQ-9 and SF-36 were used to asses for depression and quality of life respectively. Statistical associations of patients' characteristics, co-morbid depression and HRQoL scores were analyzed using Chi-square test.

Results: The prevalence of comorbid depression in patients with rheumatoid arthritis at the outpatient clinic in KNH using the PHQ-9 was 28.4%, of which 13.5% had mild depression, 9.5% had moderate depression and 5.4% had severe depression. Patients with poorer physical health quality of life scores were more likely to be depressed (p=0.041). Patients who had poorer energy scores, poorer emotional well-being scores and poorer social functioning scores were significantly more likely to be depressed.

Conclusion: In the study population of rheumatoid arthritis, the prevalence of depression is much higher than the prevalence of depression in the general population. The chronic disease has also led to poor quality of life due to the debilitating nature of the disease. Statistical negative correlation was found between sub types of quality of life scores related to energy, emotional well-being and social functioning. Poor physical health scores were found to be correlated to presence of depression. The population has greater disease activity which leads to poor physical health and poor mental health.

Key words: Rheumatoid arthritis, Depression, Quality of life, Disease activity

Introduction

Rheumatoid Arthritis (RA) is a chronic debilitating disease that affects approximately 0.5-1% of the world's population[1] and causes joint swelling and joint deformities which requires chronic medical care. Depression in the general population causes significant distress and impairment in a person's social, occupational or educational functioning. It has been shown to affect 21.3% of women and 12.7% of men[2,3]. Depression is common in patients with chronic diseases, occurring in 13-42% of patients with rheumatoid arthritis and is associated with worse outcomes[4]. Patients with rheumatoid arthritis and depression have increased health service utilization[5] and less likely to be adherent to their medications[6]. Co-morbid depression in rheumatoid arthritis has been found to be an independent risk factor for myocardial infarction[7], suicidal ideation and death[8,9].

While functional limitation is a known contributor to depression in RA, it is also well known that demographic and socioeconomic factors such as sex, age, income, education, and health access are powerful determinants of health[10-12].

Studies done in our setting on rheumatoid arthritis have provided significant data on demographics of the disease and disease activity measurement but none so far on co-relation with depression. An accurate description of the relationship between depression, functional limitation and demographic factors for our setting is necessary.

Significance of the study: Rheumatoid arthritis symptoms may confer a risk for depression, and vice versa; depression may affect RA disease activity and response to treatment. Treating depression can improve the patients' quality of life and even ease joint pain and inflammation.

Assessment of Health Related Quality of Life (HRQL) provides a reliable way for rheumatologists and arthritis researchers to better understand the effect of rheumatoid arthritis on overall functioning and well-being. Such an understanding promises to influence the quality of care provided to arthritis patients. We currently do not have local data on depression and quality of life in RA and such a study will provide such data.

Objective: To determine the prevalence of depression and their clinical and demographic characteristics (age, sex) and the relationship between depression, disease activity and HRQoL in ambulatory patients with rheumatoid arthritis at the Kenyatta National Hospital.

Materials and methods

This was a descriptive cross-sectional study conducted in the rheumatology outpatient clinic at KHN. The study included patients aged 14 years and above with a documented diagnosis of rheumatoid arthritis who gave written informed consent. The sample size was calculated using the finite population correction factor and a minimum sample size of 74 was achieved. Patients were recruited by consecutive sampling technique. Data collection was done using a structured demographic data collection tool, CDAI form, PHQ-9 and SF-36 questionnaires.

Study variables
Depression: Evaluated using PHQ-9 sore.
Severity of rheumatoid arthritis: Functional limitation evaluated using the CDAI score.
Severity of HRQOL scores: Evaluated using the SF-36 questionnaire.

Data analysis: Prevalence of co-morbid depression was calculated and presented as percentage with 95% CI. Severity of depression was presented using percentages. The HRQOL scores and CDAI scores in the study patients were presented as means, standard deviation. Factors associated with depression were analysed using Chi- square tests. The statistical test was tested at 5% level of significance. Relationships between two continuous variables, for example HRQOL and age, HRQOL and duration of illness, HRQOL and CDAI, were analyzed by Pearson correlation coefficients (where variables are normally distributed) or by Spearman rank correlation (where variables are not normally distributed).

This study was carried out after a written approval had been issued by the Department of Clinical Medicine and Therapeutics, University of Nairobi and KNH/UON Ethics and Review committee based at KNH.

Results

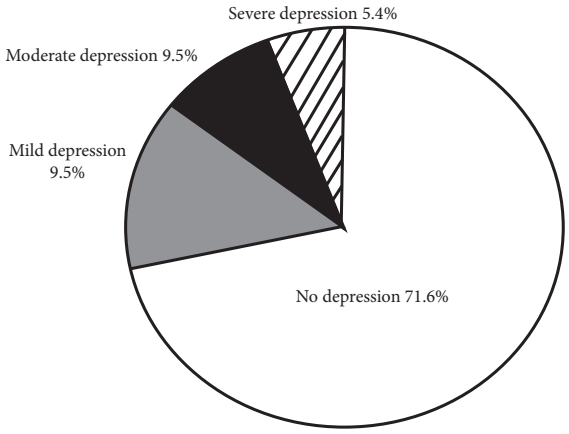
Table 1 shows the demographic characteristics of the 74 RA patients recruited in the study. The study population had a mean (SD) age of 50.6 ± 16.6 years. Patients less than 65 years formed 70.3% of the study population. The population was predominantly female at 97.3%. The bulk of the study recruits had been married, which was calculated at 60.8% of the population.

Table 1: Demographic characteristics of the RA patients recruited in the study (N=74)

Characteristic	Frequency (%)
Gender	
Male	2 (2.7)
Female	72 (97.3)
Mean age in years (SD)	
Min-Max	50.6 (16.6)
14-30	19-89
31-45	11 (14.9)
46-55	12 (16.2)
56-65	10 (13.5)
>65	19 (25.7)
	22 (29.7)
Duration of illness (years)	
0-5	26 (35.1)
6 - 10	23 (31.1)
>10	24 (32.4)
Missing	1 (1.4)
Highest level of education	
No formal education	12 (16.2)
Primary level	27 (36.5)
Secondary level	21 (28.4)
Tertiary level	12 (16.2)
Missing	2 (2.7)
Marital status	
Single	16 (21.6)
Divorced	4 (5.4)
Married	45 (60.8)
Separated	5 (6.8)
Widowed	3 (4.1)
Missing	1 (1.4)

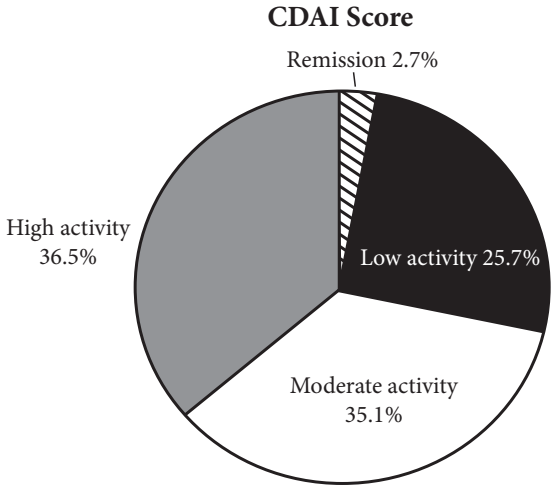
The prevalence of depression in our study population was at 28.4% whereby 21 of the 74 study participants were noted to be clinically depressed. Thirteen point five percent of the patients had mild depression, this was followed by moderate depression, with 9.5% being so, while 5.4% were severely depressed (Figure 1).

Figure 1: Prevalence of co-morbid depression in RA



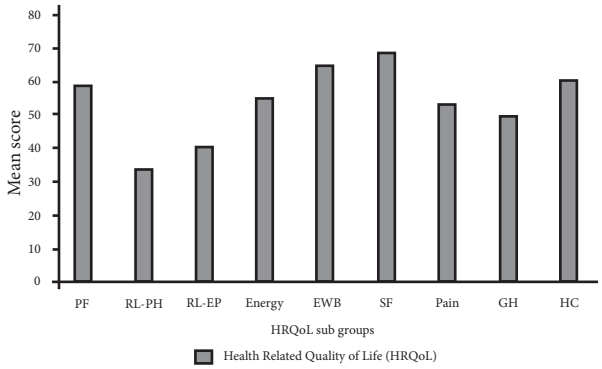
The patient's severity of rheumatoid arthritis is shown in Figure 2. Only 2.7% of the population was in remission. The bulk of the patients had moderate to high disease activity. This was presented as 35.1% as having moderate disease activity and 36.5% as having high disease activity. Low disease activity was described in 25.7% of the population. A mean CDAI score of 20.7 (SD 16.2) was noted in this cohort of RA.

Figure 2: Proportion of severity of RA



Good emotional well-being and social functioning was reported among the patients with mean scores of 64.9 (SD 19.3) and 68.9 (SD 24.8). Role limitation due to physical health had a poor score of 33.6 (SD 43.0). Fair scores were reported in other parameters of the quality of life subscales. The mean Physical Health Component summary scores and Mental Health Component summary scores were categorized as fair at 49.1 (SD 20.7) and 57.2 (SD 19.9) respectively. This was presented graphically in Figure 3.

Figure 3: Comparing mean scores of HRQoL sub-groups



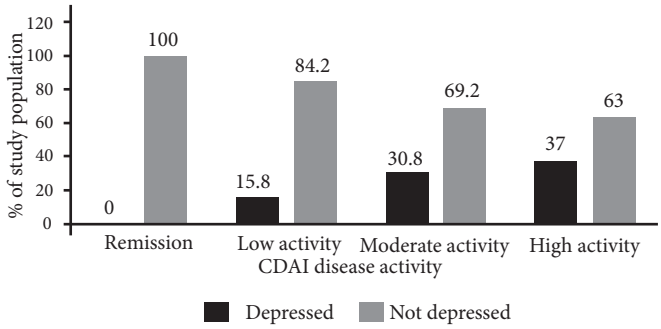
HRQOL scores were categorized as: 0-40 (poor), 41-60 (fair), 61-80 (good), 81-100 (very good).

Poorer median score were noted in all quality of life subscales in the patients who were depressed compared to those who were not depressed. Table 2 shows poor energy/fatigue, poor emotional wellbeing and poor social functioning scores were significantly related to depression in RA (p value 0.012, 0.034, 0.003 respectively). Physical Health QoL scores showed statistical correlation with depression in RA (p value 0.041). Poorer median mental health QoL scores were noted in the depressed compared to those not depressed. This however did not show any statistical significant correlation with depression in our study.

Table 2: QoL subset scores and summary scores

Variable	Depressed	Normal	P value
Physical functioning	65 (40-80)	65 (40-75)	0.942
Role limitation due to physical health	0 (0-100)	10 (0-50)	0.787
Role limitation due to emotional problem	0 (0-100)	10 (0-100)	0.806
Energy/Fatigue	50 (40-55)	55 (50-65)	0.012
Emotional well-being	52 (44-76)	68 (60-80)	0.034
Social functioning	50 (37.5-75)	75 (62.5-100)	0.003
Pain	45 (30-57.5)	47.5 (35-75)	0.317
General health	48 (30-60)	50 (40-60)	0.444
Health change	50 (25-100)	75 (50-75)	0.936
PHC	48.9 (31.9-55)	57.4 (34.3-65)	0.041
MHC	48.5 (33.6-68.8)	54 (44.6-74.9)	0.109

Figure 4: Comparison of disease activity and depression in RA



Patients whose rheumatoid activity was in remission did not have detectable depression (0%). As the disease activity worsened, the proportion of patients with depression also increased. Those with moderate level activity (30.8%) had two times increase proportion of depression compared with low activity (15.8%). Poorly controlled RA with high disease activity had the highest proportion of depression (37%) as shown in Figure 4.

Discussion

This study revealed that the prevalence of comorbid depression in rheumatoid arthritis out-patients in KNH using the PHQ-9 was 28.4%. About half (14.9%) had moderate to severe depression and this is significant because this group of patients require immediate psychiatry referral with active treatment (pharmacotherapy and/or psychotherapy)[13].

This prevalence of comorbid depression is lower than that reported in a cross-sectional study by Ndetei *et al*[14] in 2005 including 2,770 general medical out-patients across 10 different health facilities in Kenya and they reported that 42.3% of the study patients had clinical depression using BDI. The cohort of patients in Ndetei's study had various diagnosis including cancer, respiratory diseases, cardiovascular diseases, diabetes, HIV etc. and more than half of the patients suffering from cancer (59.6%) and HIV/AIDS (52.2%) had depression. These variations in study subjects as well as study design probably explain the difference in prevalence rate of depression from our study.

The overall prevalence of comorbid depression in our study was comparable to a study done in Egypt by Abdel-Nasser *et al*[15] whereby the prevalence was at 23.3% (hospital based cross-sectional study in 1998), Kobayashi-Gutlierrez *et al*[16] in Mexico (prevalence of 26.6% hospital based cross-sectional study in 2009), Alishiri[17] in Iran with a prevalence rate of 23.4% (HADS questionnaire, cross-sectional study, hospital based done in 2008). A study by Mella *et al*[18] in Brazil done in 2010 showed a higher prevalence rate of 53.2%. This similarity in the prevalence rates of comorbid depression in RA may be due to shared psycho-social stressors among the developing nations and similar health system challenges which may help explain part of this similarity in prevalence. Relatively

lower depression rates were reported in Western studies on patients with RA including Katz *et al*[5] in USA (Prevalence of 14%, using S-DGS, cross-sectional design,1994) and Mo *et al*[19], UK (PR=2.9%, using HADS, Hospital based survey, 2010). The differences in prevalence rates might be due to variation in attributes of study participants, use of different psychometric tool for depression, study design and diversity in psycho-social stressors and health seeking behaviors from one community to another.

Among the study participants with comorbid depression we also analyzed the frequency of depression based on socio-demographic and clinical parameters (including age, gender, marital status, education, and duration of RA and severity of RA.

A large portion of patients below the age of 55 years was noted to have depression. However, no statistical significance was derived. The data is important as it represents a younger population that is likely to have co-morbid depression. This cohort represents a group of patients who are in the peak of their productivity, and this lost productivity is likely to be worse since duration of uncontrolled disease worsens depression. RA with poorly controlled disease is more likely to face the physical challenges of the disease. Attributes like chronic pain and deformity, which may cause challenges of work leading to early retirement and inadequate earning that may come around. All of these factors contribute to major stressors in this age group. A study done by Wright *et al*[20] in USA, a significant correlation between age and depression was found; younger persons (age ≤45 years) with RA were significantly more depressed, even after controlling for potentially confounding variables such as sex, marital status, antidepressant medication, arthritis medication, functional class, and disease duration.

In this study, 97.3% of the patients had active disease while only 2.7% were in remission. In a study by Owino *et al*[21] done in 2009 at the KNH, a large majority of patients (88%) had active disease with 18% having mild disease, 38% moderate activity and 32% having severe disease. Only 12% of patients had disease in remission. In contrast, remission rates were at 34.8% in a study by Wolfe *et al*[22] in the UK in 2009. This may be due to better health seeking behavior, availability of newer disease modifying drugs and biologic agents which have fewer side effects and more disease modifying activity.

In this study, when CDAI scores correlated with depression they were not found to be statistically significant. However, it was noted that, as disease activity worsened, so did the percentage of depression in the study population. Such results are of particular concern because depression is known to increase the risk of mortality in RA patients[23]. In addition, patients with long-standing high disease activity are at substantially increased risk of mortality. Effective control of disease decreases mortality[24] and therapies are available to prevent progression of disease and treatment of depression. In a study by Rakiro *et al*[25] in 2019 done at the Aga Khan University Hospital Nairobi (AKUHN) showed a strong positive correlation between RA disease activity measured by CDAI and depression severity ($r= 0.643$, $p<0.001$). In a study by Yaser *et a*l[26] in 2015 in Pakistan also showed the relationship between severity of depression and activity of rheumatoid arthritis was linear with a significant p value of <0.0001.

Physical health QOL summary scores showed significant correlations with depression in rheumatoid arthritis, (p value 0.041) among the study patients. This association reflects functional capacity of patients with RA. The presence of depressive symptoms could be conditioned by fear of disability, the severe chronic pain accompanied by progressive joint destruction and disability and disfigurement. On the other hand, mental health summary scores did not show any significant correlation for depression. However, it is important to note that the clinically depressed showed higher mean mental health QoL summary scores than those who were not depressed.

Poor energy scores, poor emotional wellbeing and poor social functioning were significantly associated with clinical depression. These factors are very important as each of them forms a complex integration with the other. In general practice it may be very difficult to determine whether it is rheumatoid arthritis leading to these psychological factors or an isolated depression. Regardless of the causality, it is of clinical significance to detect these aspects and provide adequate intervention for the general wellbeing of the patient. An American study by Margaretten *et al*[27] of 172 patients found that disease severity (calculated using the Health Assessment Questionnaire, HAQ) and ethnicity were significantly associated with depression. A similar finding was noted by Esam *et al*[28] in Egypt in 2014 who studied anxiety and depression and found a strong co-relation with PCS and MCS.

There is documented evidence that functional capacity, and therefore QOL, in RA patients is influenced by multiple variables. The variables most frequently suggested are disease activity, joint destruction, and psycho-social characteristics of each individual patient. Studies have further shown that whereas disease activity is a strong determinant of functional capacity throughout the course of RA, the contribution from joint destruction becomes increasingly important with time, and is the main determinant of functional capacity later in life.

Conclusion

This study found a relatively high prevalence of depression in patients with rheumatoid arthritis. Poor quality of life scores in the sub- types - energy scores, emotional wellbeing and social functioning showed significant correlation to presence of depression. Poor physical health scores were also found to be correlated to presence of depression. A large cohort of younger patients were noted to be clinically depressed and poorer disease severity scores were noted in the clinically depressed patients.

Recommendations

The following were our recommendations from this study:

(i) We recommend that all patients with rheumatoid arthritis should be routinely assessed for depression using a simple screening tool (e.g PHQ-9).

(ii) We further recommend that larger multi- center studies should be carried out across the country to look at the burden and the risk factors of depression in rheumatoid arthritis and to design effective interventional programs.

(iii) A multi-disciplinary team including psychiatrists, psychologists and rheumatologists should be involved in the management of patients with rheumatoid arthritis who have been diagnosed to have depression.

Limitations

This was a single center hospital based study hence the findings may not be reflective of the community as a whole.

Assessment of depression was done using questionnaires and thus findings are prone to reporting bias.

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