Assessment of health-related quality of life, anxiety and depression in patients with early rheumatoid arthritis

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Abstract  Aim of the work: To assess the effect of clinical manifestations, disease activity and medications on health-related quality of life (HRQoL) among patients with early rheumatoid arthritis (RA).

Patients and methods: Twenty-six early RA patients (mean age 43.31 ± 10.51 years, disease duration: 16.5 ± 5.2 months) diagnosed according to the 2010 RA classification criteria were recruited from the outpatient clinic of the Rheumatology and Rehabilitation Department, Sohag University, and 22 age and sex matched healthy persons participated in a case control study. Demographic data were taken from all participants in the study. The 36-item short-form health survey (SF-36) and Hamilton Anxiety Rating Scale (HAM-A) were assessed as measures of HRQoL and psychiatric comorbidity for both patients and controls. Disease activity in RA was assessed using the disease activity score (DAS28). Scoring algorithms were applied to produce the physical and mental component scores (PCS and MCS).

Results: There was statistically significant difference in the total SF36 score, anxiety and depression scores of HAM-A scale between patients and controls. The PCS showed the highest significant difference (p < 0.0001), followed by SF36 (p = 0.01) and MCS (p = 0.024). There were no significant differences according to the age, gender, occupation or level of education of the patients. Anxiety and depression scores significantly correlated with the bodily pain and DAS28 scores and inversely with the...
1. Introduction

Rheumatoid arthritis (RA) is a chronic disabling multisystem autoimmune disease. It can lead to serious consequences regarding functional abilities of patients. The physical disability caused by RA is usually evident at clinical level; however, the psychological and social morbidities very easily evade the eyes of the clinician [1]. Health-related quality of life (HRQoL) questionnaires for patients are usually used to numerically quantify the effect of disease morbidity on patient’s daily living.

HRQoL is important for measuring the impact of the disease, and for evaluating the effects and cost-effectiveness of the treatment. Some studies have assessed the HRQoL in patients with RA and its improvement with early treatment [1–3]. The medical outcome study with 36-item short-form (SF-36) is one of the widely used tools that evaluates HRQoL due to an underlying illness [4].

Monitoring of people’s health at the national level has traditionally focused on morbidity and mortality measures, reportable infectious diseases, chronic conditions, and behavioural risk factors. However, these measures do not take in consideration the HRQoL which provides a broader view of daily living activity and subjective well being [5,6].

Quality of life is a multi-dimensional concept which is used to describe the individual’s perceptions, satisfaction, and evaluation of different areas of their own lives, such as physical health and functioning, psychological and emotional well being, social roles and relationships. The complex, subjective, and dynamic nature of the concept presents methodological challenges to its measurement and interpretation [7].

There are no studies from this region assessing the HRQoL in patients with early RA. The aim of our study was to assess the effect of clinical manifestations, disease activity and medications on HRQoL among patients with early RA.

2. Patients and methods

Twenty-six early RA patients (8 males and 18 females; mean age of 43.31 ± 10.51, [range 23–60] years) diagnosed according to the American college of Rheumatology (ACR)/European League against rheumatism (EULAR) 2010 RA classification criteria [8] were recruited from the outpatient clinic of the Rheumatology and Rehabilitation Department, Sohag University and 22 age and sex matched healthy persons (4 males and 18 females; mean age of 39.64 ± 9.01 [range 21–60] years) participated in a case-control study. Patients had early RA with disease duration of 16.5 ± 5.2 months (ranging from 3 months up to two years). All patients were >18 years and gave informed written consent before inclusion in the study. This study was approved by the local ethics committee of Sohag Faculty of Medicine.

Patients who suffer past or current history of chronic inflammatory diseases (e.g. gout, reactive arthritis, or psoriatic arthritis), other autoimmune rheumatic diseases (e.g. systemic lupus erythematosus, mixed connective tissue disease, scleroderma, or polymyositis), neuropsychiatric disorders (e.g. fibromyalgia) and disease duration of more than 2 years were excluded from the study.

Demographic data (age, sex, job, marital state and education) were taken from all participants in the study. The short-form SF-36, and Hamilton Anxiety Rating Scale (HAM-A) were assessed as measures of HRQoL and psychiatric co-morbidity for both patients and controls respectively. Disease activity in RA patients was assessed using the disease activity score in 28 joints (DAS28) which included an assessment of the visual analogue scale (VAS) for pain, number of tender joints (Notj), number of swollen joints (Nosj) and the erythrocyte sedimentation rate (ESR). Patients with DAS28 score higher than 5.1 were considered to have high disease activity, whereas a DAS28 below 3.2 indicates low disease activity. A patient is considered to be in remission if they have a DAS28 lower than 2.6. Items and scales of SF-36 questionnaire [9] were constructed using the Likert method of summed ratings. Answers to each question are scored, then these scores were summed to produce raw scale scores for each health concept which were then transformed to a 0–100 scale. Scoring algorithms can then be applied to produce the Physical Component Score (PCS) and Mental Component Score (MCS).

The 14 items’ HAM-A was scored from 0 to 4 (no to very severe or grossly disabling anxiety) on each item of the scale. The total anxiety score range from 0 to 56. The seven psychic anxiety items elicit psychic anxiety score that ranges from 0 to 28. The remaining seven items yield somatic anxiety score that also ranges from 0 to 28. Patients having scores ranging from 15 to 28 were considered to have mild anxiety, those who have score range from 29 to 42 were considered to have moderate anxiety, and those who have scores >42 were considered to have severe anxiety [10–11].

Statistical analysis: Data were analysed and expressed in tables and figures as mean values ± standard deviations (SD). Student’s t-test was used to compare differences between RA and controls. Pearson correlation test was used to study correlation between different quantitative variables with each group. Values were considered significant when p-values were ≤0.05. IBM-SPSS program (version 19) was used for statistical analyses.

3. Results

Patients and controls were age and sex matched, no significant statistical difference was found (t = 1.28; p = 0.21, and x² = 1.01; p = 0.32). All patients had early RA with mean disease duration of 16.5 ± 5.2 (range 6–24) months.
Demographic and clinical characteristics as well as the medications received by the RA patients are presented in Table 1. The controls were of comparable education level to the patients; 6(27.2%) were non-educated, 5(22.7%) achieved primary education, 4(18%) secondary education and 7(31.8%) highly educated. However, there were much more employed controls (86%) and 2 were workers and only one was a housewife.

There was statistically significant difference between total SF36 score, anxiety and depression scores of HAM-A scale between patients and controls (Table 2). Moreover, all SF36 subscales were significantly different between both groups (Table 2).

The significant differences between patients and controls in all PCS, MCS, total SF-36, depression and anxiety scores were not related to the sex of the patient ($F = 0.67; p = 0.42$). Also, there was no statistically significant difference between male and female patients regarding the VAS, Noj, Notj, ESR and DAS28.

Regarding the effect of occupation on HRQoL and psychiatric scales, there was no statistically significant difference between employees and housewives in physical functioning, bodily pain, PCS, MCS, total SF-36, depression and anxiety scores ($F = 0.006, 0.18, 0.63, 0.56, 0.59, 0.102$ and $0.302$, respectively; $p = 0.94, 0.68, 0.43, 0.46, 0.45, 0.75$ and $0.59$, respectively); although being worse in housewives showing a lower physical function and higher bodily pain. According to the education level, highly educated patients had a lower quality of life (QoL) than non-educated patients in the domains of physical function, the PCS and the MCS although they showed significantly less bodily pain than the non-educated.

The PCS has the highest significant difference between cases and controls ($p = 0.0001$), followed by SF36 ($p = 0.01$), then MCS ($p = 0.024$), but non-significant differences regarding bodily pain, physical functioning, depression and anxiety ($p = 0.399, 0.485, 0.209$ and $0.585$, respectively). The age of the patient has nothing to do with HRQoL or psychiatric scales, as there was no significant difference between young (<45 years), and old (>45 years) patients regarding bodily pain and higher MCS although they showed significantly less bodily pain than the non-educated.

The prevalence of anxiety in the present study was 26.9%. Patients with lower level of education had much higher level of anxiety than highly educated ones.

There was significant negative correlation between anxiety score at one side and PCS and MCS on the other side ($r = -0.38; p < 0.05$, and $r = -0.34; p < 0.05$ respectively). The same applies for depression score and PCS and MCS ($r = -0.45; p < 0.05$, and $r = -0.43; p < 0.05$, respectively). There was significant correlation between both anxiety and depression scores with the bodily pain and DAS28 scores (anxiety; $r = 0.56; p < 0.01$, and $r = 0.47; p < 0.05$, and depression; $r = 0.63; p < 0.001$, and $r = 0.55; p < 0.01$, respectively) (Fig. 1). Finally, there was a strongly negative correlation between DAS28 and both PCS and MCS ($r = -0.89; p < 0.001$, and $r = -0.9; p < 0.001$, respectively) (Fig. 2).

### 4. Discussion

Rheumatoid Arthritis is a chronic inflammatory disease of unknown aetiology, with an unpredictable course and prognosis. Thus, it is not surprising that many patients with RA experience anxiety and helplessness [12]. The intensity of the disease varies and the individual has to learn to live with pain and disabilities to a greater or lesser extent as part of his or her life.
It is therefore important to measure health status as well as other non-medical aspects of life such as social and emotional functioning and family and peer relationships from the patient’s point of view [13].

Five dimensions are recommended as a minimum standard for measuring health: physical health, mental health, everyday functioning in social and role activities and general perceptions of wellbeing [14]. The World Health Organisation (WHO) defines QoL as an individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns [15]. Quality of life can be divided into health-related (with physical, psychological, social, and spiritual subdomains) and non-health related (with personal, social interaction, societal, and environmental subdomains). The objectives of this study were to determine HRQoL and psychological distress in patients with early RA and assess the effect of clinical manifestations, disease activity and medications.

In our study we found that HRQoL scores significantly decreased in patients compared to controls, they are decreased in all domains of SF 36. The mean PCS and MCS were significantly lower in patients than in controls. These results were in agreement with the study of West and Jonsson [16], which concluded that RA has negative impacts on patients’ physical, emotional and social functioning early in the disease measured by the SF-36.

In our study there were significant difference in the SF-36 role physical (RP) and social functioning (SF) subscales observed in patients compared to healthy controls, this is consistent with the results of Benitha and Tikly [17] but in contrast with an Italian study of Rinaldi et al. [18] that showed no difference in the SF-36 RP and SF subscales between patients and controls.

As regards the general health (GH) subscale, it was significantly affected, this is in contrast to Thyberg et al. [19] where no affection of the GH was detected. Kojima et al. [20] found that some patients who had a poor physical status could maintain a good mental QoL despite pain, fatigue, psychological distress, and/or low social support. In the current study it was found that physical health is of the most affected domains of SF-36 and this is consistent with Salaffi et al. [4]. The bodily pain (BP) is an important factor in determining the QoL in the early course of the disease [21]. In our study there is highly significant increase in BP in patients than in controls which affect other aspects in their life such as the social aspect and limitation of their physical activity.

In this study we tried to determine other factors affecting HRQoL besides RA affection as regards age, sex, level of

![Figure 1](image1.png)

**Figure 1** Correlation of the disease activity score (DAS28) with the (a) depression and (b) anxiety scores in early rheumatoid arthritis patients.

![Figure 2](image2.png)

**Figure 2** Correlation of the disease activity score (DAS28) with the health-related quality of life (HRQoL) scores; (a) physical health, (b) mental health and (c) the total short form 36 (SF36) score in early rheumatoid arthritis patients.
education, job and disease activity. We found no gender difference in the QoL in patients with early rheumatoid, this is in agreement with Dagfinrud et al. [22] and Salaffi et al. [4] who found that the QoL was similar in men and women however there were sex related differences as women reported lower scores than men in role limitations due to physical function and in general health subscales. These results were in contrast with West and Jonsson [16]. The women in their study reported significantly better physical functioning (PF) than men at 24 months. Furthermore, we found no age difference as regards the QoL which is in agreement with Thyberg et al. [19] who found no relation with age or sex. On the other hand, Núñez et al. [23] found that younger patients with the highest socioeconomic level have better QoL.

According to the education level, we found that highly educated patients have lower QoL than non-educated patients in the domains of physical function, PCS and MCS although they showed a significant less bodily pain than non-educated. This was in contrast with Salaffi et al. [4] who found that lower levels of formal education have been reported to be a risk factor for the presence of chronic musculoskeletal pain and physical function. In our study we found the worst QoL between housewives than employees having a lower physical function and higher bodily pain. This is in consistent with the study of Habib et al. [24] and in contrast with Allaire et al. [25] who found a much lower prevalence of household work disability.

In our study, there is a significant inverse correlation between disease activity score (DAS28) and the PCS and MCS scores, similar results were found in the study of Benitha and Tikly [17] and also were consistent with the studies of Taylo et al. [26] and Aggarwal et al. [27] who found a significant effect of disease duration, functional disability and disease activity on QoL.

Depression in RA is closely associated with pain, work disability, health service utilisation, poor adherence to treatment and suicide [28]. Regular mood assessment by rheumatology clinical staff may serve to improve awareness and early identification of depression, and thus timely identification and treatment of depression in RA are critical to overall clinical management [28–29]. Chronic pain and restriction of physical activity, instability of the disease symptoms and clinical progression, and ability to predict the prognosis increases the prevalence of anxiety in RA cases [30]. In our study we found highly significant increase in depression in patients compared to the control, this is similar to the study of Smedstad et al. [31] and Dickens et al. [32] but another study did not find this difference [33]. Our findings suggest that some of these differences might be due to methodological problems such as lack of the use of strict criteria and appropriate controls.

In our study, we found strong correlation between depression and anxiety on one hand and PCS and MCS on the other hand, this is in agreement with Covic et al. [34] who found that physical limitations predict emotional involvement especially depression, also there is a strong correlation between them and specifically the body pain affection.

In our study we found that patients with lower level of education had much higher level of anxiety than highly educated patients. Evers et al. [35] have reported that low educational level is associated with depression and anxiety in RA cases. We also found a strong correlation between anxiety and depression with the disease activity (DAS28) which is in consistent with Scot [36], who established that disease activity has a great influence on the joint damage and clinical outcomes. The prevalence of anxiety in our study was 26.9% which was in contrast with El-Miedany and El-Rashed [37] who found that the prevalence of anxiety was higher than depression.

Our study confirms that depression deserves more attention in the care of patients with RA. The goal of treatment is to improve the quality of life, concentrating on changing socio-psychological factors rather than simply bodily functions. This is in accordance with the results of another study [38]. Depression is a risk factor for non-compliance with medical treatment in RA and is a risk factor for poor outcome. Such patients might not be adhering to medical advice [39].

In conclusion, early RA has a major impact on many areas of an individual’s life and tends to have a profound impact on the health-related quality of life.

Conflict of interest

The authors declare no conflict of interest.

References


