

Impact of Rheumatoid Arthritis and disease activity on work productivity and quality of life

Introduction: Rheumatoid Arthritis (RA) physical disability can impair the Quality of Life (QoL) and professional activity. Aim of the work: to assess the impact of RA on work productivity and functional impairment in Tunisian patients. Relation to the disease activity was also considered. Patients and methods: The study included 25 RA patients having a professional occupation at the time of disease onset. The Disease Activity Score (DAS28), Health Assessment Questionnaire (HAQ) and 'Work Productivity and Activity Impairment' (WPAI) questionnaire were assessed. Results: The mean age of the patients was 50.4 ± 8.3 years with a female: male ratio of 1.08. The mean age at onset was 40.6 ± 9.8 years and the mean disease duration was 9.8 ± 9.68 years. The patients' occupation involved a manual job in 84% of cases. The mean of DAS28 was 4.3 ± 1.6 ; 72% had moderate to severe disease activity. The mean HAQ was 1.4 ± 0.7 and 76% had moderate to severe disability. The evaluation of the work productivity and activity impairment objectified an absenteeism of $30.7 \pm 39.4\%$, presenteeism of $46.7 \pm 26.4\%$, work productivity loss of $60.4 \pm 33.8\%$ and an activity impairment of $57.2 \pm 25.4\%$. A significant correlation was noted between WPAI parameters and HAQ ($p < 0.0001$) and of the decline in productivity and daily activity with DAS28 ($p = 0.01$). Conclusion: Functional impairment and disease activity affected productivity and work ability in Tunisian RA patients. Absenteeism, increase of presenteeism, decline of productivity and daily activity were associated with the HAQ and the latter 2 with the disease activity but not with the age of patients or disease duration.

Keywords: rheumatoid arthritis • work productivity • quality of life

Introduction

Rheumatoid Arthritis (RA) is the most common chronic inflammatory rheumatism in adults. In developed countries, it affects 0.5 to 1% of adults with a prevalence of 5-50/100000 new cases annually [1]. Most of the patients are of working age at the time of symptoms onset. Fatigue and functional impairment are common in rheumatic diseases and are higher in women and in those with a lower social economic status. Fatigue affects patients' cognition, mood and abilities to maintain employment [2]. The Quality of Life (QoL) is impaired in RA patients and disease duration was a significant predictor. Routine assessment of the health-related QoL in those patients is recommended to detect and monitor the impact of the disease and medications used [3,4]. RA affects all aspects of life including social and psychological well-being in addition to physical symptoms. RA patients either quit

or change their jobs in a 2-year period with a rate of 33 and 16%, respectively [5].

Fatigue has a significant and independent effect on absenteeism, presenteeism, productivity loss, and activity impairment for RA patients and a significant but dimension-selective effect on work disability among AS patients [6]. In a recent study, absenteeism was high amongst Tunisian ankylosing spondylitis patients and work conditions were important factors that directly influenced their productivity [7]. Persistent joint inflammation leads progressively to erosive joint damages, disabilities and functional impairment that affect professional activity in RA [8,9]. Work disability can start early in the course of the disease [10] and affects 22-44% of patients with RA [11]. Around 60% of established RA patients are unable to work [12]. Direct and indirect costs of the disease often were high and differ according to countries, type

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of treatments (including or not biologics), disease duration and the economic analysis models used to their evaluation. Direct total annual medical costs using any treatments regimen was estimated at a high rate in the USA and at a higher cost in Europe [13,14]. Data on the economic burden of RA in Middle East and Africa were not always available [15,16].

Patients with RA still face significant limitations regarding their ability to work. Disability and EULAR response were the main predictors of work outcomes, emphasizing the need to control the disease and the importance of function in enabling work participation [17]. RA patients are dealing with workplace disabilities and limitations and loss in QoL, and multiple factors seems to be associated with this. Worsening of disease activity further decreased work productivity and QoL, stressing the importance of disease tight control [18].

The aim of the work was to analyze professional working features of Tunisian RA patients and to assess the impact of disease and activity on their professional activity and QoL.

Patients and methods

The study included 25 RA patients diagnosed according to the American college of rheumatology/European league against rheumatism RA classification criteria [19] were recruited from the Rheumatology Department of the Rabta Hospital (Tunis). Only patients with a professional activity at the onset of the disease were included in the study. Patients with functional impairment disability due to another disease other than RA were excluded. A consent was obtained from the patients after explanation of the purpose of the study. The study was approved by the ethical committee of Rabta Hospital.

Data were collected from patient files, phone calls and on direct contact after calling the patients. Data included sociodemographic features as age, sex, marital status, number of dependent children; medical history as age at onset, disease duration, number of tender joints, number of swollen joints, extra-articular involvement, morning stiffness, night awakenings; Visual Analog Scale (VAS), C-Reactive Protein (CRP), Rheumatoid Factor (RF); x-ray findings of hands and forefoot; current treatment and need for hospitalization. Data on professional activity included line of work, position held, professional duration, means of transport to work and route duration, constraints at work, occupational health consultation, difficulties with the employer and colleagues.

The Disease Activity Score (DAS28) was assessed [20]. Activity was graded as remission (<2.6), low (2.6-3.2), moderate (3.2-5.1) or high (>5.1).

The professional impact of RA was assessed using the 'Work Productivity and Activity Impairment' (WPAI:RA) questionnaire [21,22]. Since there is no valid Tunisian questionnaire the Arabic Egyptian version 2.0 was used [23]. It is a validated instrument that includes six questions. The patient answers according to his seven-days-experience preceding the survey. The questionnaire helps to determine the absenteeism and presenteeism at work, the decrease of total productivity and daily activities. Absenteeism defines the percentage of absences to work days during a period of work time lost due to RA. Presenteeism defines the percentage of productivity decline while being at work when ill.

The QoL was assessed using Health Assessment Questionnaire (HAQ) score [24]. Patients were classified into three grades of disability:

- slight difficulties with moderate disability (HAQ 0-1)
- moderate to severe disability (HAQ 1-2) and
- severe to very severe (HAQ 2-3)

Statistical analysis

The Statistical Package for the Social Sciences (SPSS) version 19.0 was used. Results were presented as number and frequencies for qualitative variables and as mean, median and standard deviation for the quantitative variables. Comparison was carried out by Pearson Chi-square and Fisher's bilateral exact test. The links between 2 quantitative variables were studied by the Spearman rank correlation coefficient. Significance was set at $p < 0.05$.

Results

The 25 RA patients were 13 females (52%) and 12 males (48%), living in both rural and urban communities. Their mean age was 50.4 ± 8.3 years (32-63 years). 80% of patients were married, and 68% of them had at least two children. 5 patients had co-morbidities: diabetes in 4 (16%), and heart disease and hypertension in 4 (16%) patients. The mean disease duration was 9.8 ± 9.68 years (1-42 years). The main proportions were represented by classes of 3-7 years (44%) and 8-18 years (32%). The mean age of onset was 40.6 ± 9.8 years (12-54 years). The mean DAS28 was 4.3 ± 1.6 (1.7-7.8). The disease activity was high in 9 (36%), moderate in 9 (36%), low in 3 (12%) and complete remission was observed in 4 (16%). 8 (32%) had bone erosions revealed by x-ray.

Conventional DMARDs including methotrexate (18 ± 2.1 mg/week) and sulfasalazine (2 g/day) were used in 92% of patients. Biologic DMARDs (anti-tumor necrosis factors; etanercept and infliximab) were used by 2 patients aged 43 and 55 years whose disease was refractory to conventional DMARDs. 4 patients were awaiting treatment with bDMARDs (because of their insurance coverage). Corticosteroids were required in 17 (68%) with a mean dose of 9.6 ± 3.5 mg/day. The mean HAQ was 1.38 ± 0.69 (0-2.37); 60% had moderate functional disability (mean HAQ for this patients: 1.53 ± 0.38) and was severe in 4 patients (3.31 ± 0.62).

Patients had diverse professional workstation positions (Table 1). 21 (84%) were manual workers with modest monthly incomes. The highest frequencies were unskilled workers (28%), maids (20%) and welders (12%). The mean professional experience duration was 21.8 ± 12.8 years (1-45 years). 2(8%) went to work on foot with a mean walking time of 15.7 ± 13.92 minutes. Heavy load lifting (52%), repeated movements (40%), prolonged standing (36%) and noise (20%) was the main reported constraints by the patients (Table 2). 32% and 16%

of patients had difficulties with their employers and problems with their colleagues, respectively.

Rates of absenteeism and presenteeism were $30.7 \pm 39.4\%$ (0-100) and $46.7 \pm 26.4\%$ (10-80), respectively. The total productivity and the total daily activity decreased by $60.4 \pm 33.8\%$ (10-100) and $57.2 \pm 25.4\%$ (10-90). The professional career of patients was under threat in 10 (40%) patients; resignation was due to medical reasons (Table 2). Only 5 (20%) had access to occupational health consultation and follow-up.

The correlations of DAS28 with presenteeism, total decrease in productivity, and total decline in daily activity were all significant (Table 3). The HAQ significantly correlated with DAS28 and with all measured parameters of the WPAl:RA. Age of the patients and the disease duration did not significantly correlate with parameters of work and activity impairment.

Table 1. Workstations of the Tunisian rheumatoid arthritis patients.

Occupation	Working RA patients (n=25)
Daily construction	7(28%)
Maid	5(20%)
Worker using a jackhammer	3(12%)
Welder	2(8%)
Guardian	2(8%)
Driver	1(4%)
Gas station	1(4%)
Storekeeper	1(4%)
Worker	1(4%)
Masseur in a Moorish bath	1(4%)
Butcher	1(4%)
Teacher	1(4%)

Table 2. Professional constraints and become of the Tunisian rheumatoid arthritis patients.

Parameter	Working RA patients (n=25)
Constraints	
Heavy loads	13 (52%)
Repetitive movements	10(40%)
Prolonged standing	9(36%)
Noise	5(20%)
Chain work	3(12%)
High temperatures	3(12%)
Low temperatures	3(12%)
Vibrations	1(4%)
Become	
Resignation	10(40%)
Keeping the same job	8(32%)
Adjustement	2(8%)
Reclassification	3(12%)
Dismissal	1(4%)
Early retirement	1(4%)

Table 3. Correlations between absenteeism, presenteeism, total declines in productivity and daily activity with age, disease duration, disease activity and health assessment questionnaire in rheumatoid arthritis patients.

Parameter r(p)	RA patients (n=25)			
	Age	Dis. Dur.	HAQ	DAS28
Absenteeism	-0.17 (0.59)	-0.33 (0.3)	0.83 (<0.001)	0.53 (0.05)
Presenteeism	-0.32 (0.31)	-0.39 (0.22)	0.87 (<0.001)	0.72 (0.08)
Decline in productivity	-0.22 (0.49)	-0.42 (0.17)	0.942 (<0.001)	0.65 (0.01)
Decline in daily activity	-0.33 (0.29)	-0.36 (0.25)	0.84 (<0.001)	0.49 (0.01)

RA: Rheumatoid Arthritis; Dis. Dur: Disease Duration; HAQ: Health Assessment Questionnaire; DAS28: Disease Activity Score
 Bold values are significant at $p<0.05$

Discussion

Rheumatoid arthritis is an inflammatory disease affecting patients of working age with high direct and indirect socioeconomic impacts. The annual economic burden of RA mostly due to indirect costs due to disability and absenteeism in the USA was so high [25]. These impacts in Tunisia as well as in most Middle East and African countries remain under estimated. In Morocco, the economic burden of RA was estimated at a low monthly cost per patient [26].

In this work 25 Tunisian working RA patients were studied. The mean age of patients was 50.4 ± 8.3 years. This average is comparable to that reported in studies from other countries examining the impacts of RA on patient's work [27]. The mean age of RA onset was 40.6 ± 9.8 years. This was lower than that found in literature. It could be due to the selection of a professionally active population at the disease onset. The mean age of RA onset reported was 60.3 ± 15.9 years according to Eriksson et al. [28] and a median of 61 years was reported [29]. Duration between symptoms onset, diagnosis and treatment could not be determined because of the mainly retrospective nature of the information collected which has limits. Despite their effectiveness in the treatment of RA and improvement of the patient's QoL, biologics were used by those who respond insufficiently to conventional DMARDs [30].

Absenteeism and presenteeism were commonly reported by RA patients compared to control [31]. These parameters differ wildly among countries according to the gross domestic product (GDP). RA patients from low GDP countries had lower presenteeism and higher absenteeism compared to higher GDP ones [27]. In this study, absenteeism and presenteeism of the patients were $30.7 \pm 39.4\%$ and $46.7 \pm 26.4\%$ of patients. These values are comparable to the mean frequencies reported for Moroccan RA patients ($43.8 \pm 43.9\%$ and $34 \pm 22.3\%$, respectively). However, they were higher than those for Egyptian RA patients ($26 \pm 33.9\%$ and $31.2 \pm 25.8\%$) and lower than those from Saudi Arabia ($64 \pm 11.6\%$ and $62.2 \pm 20.1\%$) [26,27,32]. Presenteeism and absenteeism correlated with DAS28 and HAQ, respectively and not to age of patients or disease duration. According to Bertin et al. the HAQ was a key factor of absenteeism [33]. Similar conclusions were noted by Lenssinck et al. in a systematic review [34]. Higher disease activity or functional disability had more impact on work's productivity. Zhang et al. showed a decrease in work productivity in 48% of Chinese RA patients [35].

A total decrease of productivity was observed in 60.4% of patients. Main factors significantly linked to this decline are disease activity and HAQ. 72% of cases had moderate to severe RA and 60% of them were suffering from moderate to severe functional disability. The relationships between these factors as well as those related to the decrease in daily activity and disease duration were reported in RA patients from different geographical origins [36,37]. The decrease of daily activity ranged from 27.4 to 42.5% in Latin American countries [37]. In this work, reduced performance was not significantly related to the age or disease duration.

Flares in RA patients lead to physical disability, impaired QoL and unemployment. In this study, 44% of the patients declared having stopped work, resignation or termination, because of their disease. This was similar to the frequency reported by Bertin et al. [33]. In Morocco, 64% of RA patients stopped their professional occupation after disease duration of 83 months [26]. In France 34% of RA patients retired early due to their illness [38]. However, it is important to note that RA-related work stoppage, besides HAQ is related to other factors such as age, gender, type of patient's work and the socioeconomic situation [39,40]. These factors in the present study were not assessed because of the limited number of patients.

Lost productivity and lost daily activity as well as change of job or permanent work stoppage represent indirect costs due to RA. The latter should be associated to direct ones (i.e. expenses related to drugs, hospital visits). In this work, due to the lack of available data, these costs were not evaluated. Indeed, the study has some limitations; the retrospective nature of the study and the small number of patients included as most of them were females and staying at home. It is recommended that a larger scale longitudinal study is conducted in order to encompass the actual spectrum of affection of working RA patients on a nationwide scale. Absence of a control group is a major limitation to the value of the reached results especially that there are no results for normal individuals in Tunisia.

Conclusion

Functional impairment and disease activity in RA affected productivity and work ability. This study constitutes a first step for the analysis of the impacts of RA on work productivity and activity impairment in Tunisian patients. Increase of absenteeism, increase of presenteeism, decline of productivity and daily activity were associated with the HAQ and the latter 2 with

the disease activity but not with the age of patients or disease duration.

Conflict of interest

None

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