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Professional impact of rheumatoid arthritis: a cross sectional study among fifty patients.

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Abstract

Objective: to evaluate professional impact of RA on the affected subjects.

Materials and Methods: A trans-sectional study was conducted in the Rheumatology Service of University Hospital of Monastir, in Tunisia; between 1999 and 2013. Study

population is represented by patients with the diagnosis of and selected according to inclusion and exclusion criteria. The severity of RA was evaluated through the Health Assessment Questionnaire (HAQ) and the capacity of work was assessed according to the Work ability index score (WAI).

Results: Half of patients stopped definitively their professional activity because of their illness that occurred in the majority of cases at the first 5 years of evolution of the disease. Working leaving was found in 48 % of cases, invalidity in 28 % of cases, early retirement in 12 % of cases and the long-term sick leave in 12 % of cases. Predictors of work stoppages were the means of transport between the place of residence and workplace, the work sector, the professional category and to presence of coxopaty. Patients in professional activity had a mean score of WAI 28± 8.28, 80 % of them had a working capacity poor to moderate. Predictive factors of poor work ability were the type of profession, exposure to movements in hyper flexion, hyperextension of wrists and to repetitive gestures and a high HAQ score.

Conclusions: Loss of work among patients with RA is a multifactorial and complex phenomenon involving socio-demographic, clinical and other parameters related to professional environment.

Keys words: Arthritis Rheumatoid; Work Ability Index; Disability.

1- Introduction :

Rheumatoid arthritis (RA) is the most frequent inflammatory rheumatism [1]. It is a chronic autoimmune disorder that progresses by pushing, causing progressive joint destruction with significant functional, psychological and professional implications [1,2]. RA results from an interaction between genetic and environmental factors, causes an

immunological disorder [2]. Although, the disease can occur at any age, more than 50% of patients with RA are of working age. [3]

The disease is associated to an early limitation of functional capacities impeding realization of daily activities. These manifestations often lead to a permanent interruption of professional activity for the majority of patients [4]. According to some studies, more than half of patients are obliged to stop working less than five years after the onset of the disease and one in ten has severe disability among first two years. [2, 5]

This inability to work is one of the most important economic consequences of RA [4,6]. A study published in the review of rheumatism estimates the cost of treatment of RA between 1800 and 12.000 euros / year, but above all, it points the indirect cost of the disease, in terms of stoppage of work and loss of productivity, estimated between 1200 and 37 000 euros per patient and per year. [7]

Professional impact of RA appears to be linked to individual factors (advanced age, functional disability, low level of education, etc.), clinical factors (degree of structural injury, disease activity, pain) and to therapeutic strategies of this disease.

Motivated by numerous recent publications in this field, this work aims to evaluate the professional impact of rheumatoid arthritis.

This is a trans-sectional study of patients with rheumatoid arthritis monitored at the University Hospital of Monastir in Tunisia during the period of 1999 to 2013.

1- **Materials and Methods:**

Study population: General population consists of all patients hospitalized or followed up to the consultation of Rheumatology at the University Hospital of Monastir in Tunisia during the period of 1999 to 2013. We included in this study all patients between 18 and 60 years-old, with a RA diagnosed according to ACR1987 and EULAR 2010 criteria,

occupationally active patients and who had stopped working due to RA. We excluded patients with RA diagnosed at age over 60 years.

During the study period, we counted 470 patients followed for RA, 50 subjects met inclusion criteria.

Materials:

Data collection was based on a fact sheet prepared beforehand and completed by an investigator doctor. Clinical and para clinic data were collected from records. Some information is collected during a telephonic contact.

The questionnaire contains both open and closed-ended questions and concerns socio-demographic data (age, sex, background, social coverage, etc.) and occupational data (sector of activity, occupation, position, professional status…).

The evaluation of the rheumatic disease concerned the description of data related to the parameters of disease activity evaluated by the Disease Activity Score (DAS). It is a composite index of RA activity developed by EULAR (European League Against Rheumatism).

DAS 28 is a simplification of the DAS. The joint analysis is performed on 28 articular sites (10 metacarpophalangeal, 8 interphalangeal proximal of the hands, 2 interphalangeal thumbs, 2 wrists, 2 knees, 2 elbows, 2 shoulders). It takes into account the number of synovitis and joints painful to palpation (Ritchie's index), the result of the rate of sedimentation and the overall assessment of the disease, evaluated by the patient on a visual analog scale [9]. The DAS 28 score allowed defining 5 levels of RA activity: RA in remission for a score less than 2.6; RA of low activity level for a score between 2.6 and 3.2; RA moderately active for a score of 3.2 to 5.1 and a very active RA for a score above 5.1.

Professional outcome consequences are evaluated by the Work Ability Index (WAI). It is the most used and accepted instrument for measuring work capacity [8, 9], its validity and reliability have been tested in various studies [10,11]. It consists of 11 items and is based on a self-judgment of the subject on his ability to work. The WAI would allow predicting, performance, sick leave, incapacity for work, withdrawal from work and also mortality [10, 11, 13]. The WAI score varies from:

- 7 to 27 corresponding to a low capacity of work.

- 28 to 36 corresponding to a moderate capacity of work.

- 37 to 43 corresponding to a good working capacity.

- 44 to 49 corresponding to an excellent working capacity.

The quality of life assessment was based on the HAQ (Health assessment questionnaire). It is a standardized and validated scale that explores the ability to perform the gestures of everyday life [14]. This questionnaire explores eight areas of activity: dressing and preparing, getting up, eating, walking, hygiene, reaching and catching, grasping and other activities over the past eight days [9, 14]. Each field consists of 2 to 3 questions with a score of 0-3 assigned by the patient depending on the difficulty of the task (0: no difficulties, 1: some difficulties, 2: many difficulties, 3: disability to perform). The score HAQ varies from 0 to 3 and the RA is considered severe if the score is greater than 0.5. [8]

Statistical analysis: We calculated the frequencies and percentages for the qualitative variables, as well as averages, standard deviations, medians, extent of extreme values for quantitative variables. To compare averages, we used the "t" test of Student and the "f" test of ANOVA. For the comparison of frequencies, we performed the chi2 test. For multivariate analysis, we used a multiple linear regression when the dependent variable is quantitative and a multiple binary logistic regression when the dependent variable is

qualitative. The inclusion of independent variables in the regression models was done when their degree of significance was less than 0.2. The threshold of significance p was set at 0.05.

2- **Results:**

The study population was characterized by a female predominance with a sex ratio of 0.22 and a mean age of 48.1 ± 8.1 years. The majority of patients were married (78%) and 16% were single. The average number of dependent children was 2 with extremes ranging from 0 to 7. The breakdown of the study population by level of education found that 12% were illiterate. Forty four patients (88%) had social coverage. Our patients walked on foot in 58% of cases and by a common means of transport in 20% of cases.

Clinical data:

Cardiovascular diseases and metabolic disorders were the main comorbidities associated with RA with a respectively prevalence of 24% and 14%. The mean evolution of the disease was 12 ± 8.5 years. The average body mass index was 27.5 ± 5.2 kg / m^2 with extremes ranging from 18.2 to 36.9 kg / m^2. Extra-articular manifestations of RA were observed in 19 cases (38%), dominated by dry eye syndrome (30% of cases) and rheumatoid nodules (10%). Articular deformations were observed in 21 cases (42%). The mean DAS28 score was 4.9 ± 1.5 with extremes ranging from 2 to 7.7. Nearly half of patients had very active RA at the time of diagnosis (48%). (Figure 1)

Professional Data:

Patients are affected in 34% cases in clothing sector, followed by the education sector (10% of cases) and the trade sector (8% of cases). The distribution of the study population according to occupation finds that 50% are workers and 8% are teachers.

The average of professional tenure was 20.5 ± 9 years with extremes ranging from 4 to 45 years. Qualified patients accounted for 40% of cases.

Physical restraints were reported by 45 patients (90%). The majority of the patients worked under a biomechanical constraint, particularly standing (40%) or prolonged sitting (38%). Psychosocial constraints were described by 8 patients (14%), mainly due to difficulties with hierarchy (5 cases) and with colleagues (3 cases).

The mean of HAQ was 1.65 ± 0.77 with extremes ranging from 0.12 to 2.75. The majority of patients had an HAQ ≥ 0.5 (44 cases, 88%).

Professional consequences of RA:

Half of studied population stopped working because of their illness. Twelve patients have abandoned their job that is voluntary in 11 cases (44%) and due to economic dismissal in 1 case (4%). Disability was reported in 7 cases (28%). Early retirement was recorded in 3 cases (12%) and a long-term sick leave is recognized in 3 cases.

The stops of professional activity occurred after 5 years of RA evolution for 13 patients. A professional reinsertion in the same company was realized to 8 cases (16%), 4 patients had changed the company.

In univariate analytic study, work stoppages were significantly dependent on age ($p = 0.023$), level of education ($p = 0.033$) and means of transport between place of residence and work ($p = 0.01$). Also, sector of professional activity and occupational category were significantly correlated with work stoppages in patients with RA with $p = 0.02$ and 0.01, respectively.

Among the clinical factors, work stoppages depended significantly on the duration of disease ($p = 0.012$), the presence of articular deformation ($p = 0.031$) and the HAQ score ($p < 0.01$). (Table 1)

After binary logistic regression, working stoppage of patients with RA is statistically correlated with means of transport between place of residence and work, industry sector, professional category, and presence of coxopathy. (Table 2)

Ability at work:

The mean WAI score was 28.1 ± 8.28 with extremes ranging from 8.5 to 44. The majority of patients who are still working were of low capacity (48% for a workforce of 12).

In this study, no socio-demographic factors influenced the work capacity of employees with RA. The work capacity was significantly dependent on the age of disease ($p = 0.024$), workplace exposure to repetitive wrist gestures ($p = 0.039$), hyper flexion and hyper wrist extension ($p = 0.039$) and vegetable dust ($p = 0.015$). (Table 3)

In our study, no socio-demographic factors were associated with work capacity.

She was significantly associated with the profession, exposure to hyper flexion and hyper extension of the wrists, exposure to repetitive gestures. The HAQ score negatively affected work capacity. (Table 4)

Discussion:

Rheumatoid arthritis (RA) is frequent chronic inflammatory rheumatism. The average age of onset is between 35 and 55 years, and this explains that more than 50% of patients with RA are on working age. The effect of RA on occupational activity is examined in various studies, although definition of incapacity for work varied between total, partial, temporary or permanent work stoppages, estimated at 13% at 6 months and 67% at 15 years of

evolution through the various studies [14,5]. Long-term sick leave was found in 20% of cases and disability was found in 12% of cases after 3 years of development [5].

In this study, the average score of the Work Ability Index was 28, placing our population in the wrong category, work capacity was low in 48% of patients and moderate in 32%.

Our results were different from those obtained by Mazloumi et al. who for 420 employees in the Iranian petrochemical industry found an average WAI score of 39 and a low to moderate working capacity in only 34.3% of the cases [15]. It was also found in a quarter of cases with an average WAI of 41 in the study of El Fassi et al. covering 12839 German employees. [16]

In manufacturing and construction industry, Smolander et al. pointed out a good to excellent working capacity in 67% of finishers workers, [19] best results were objectified for 19 507 German construction workers included in the study of Alavinia et al., where a good score of WAI was noted in 83.9% cases. [20]

Among workers in the metallurgical industry in Brazil, Padula et al. reported an average WAI score of 38 placing them in the good category. [21]

Our findings were similar to those reported by Ahlstrom et al., who noted a low to moderate work capacity for 93% of 324 Swedish women workers [22].

After binary regression, work abilities of studied population depended on occupation, hyperextension, hyperflexion and repetitive gestures of wrists and on HAQ score. Physical constraints such as poor organization of workplaces, manual work, uncomfortable postures, repetitive gestures [20, 23, 24] and psychosocial constraints such as conflict of roles, lack of autonomy, dissatisfaction with hierarchy, verbal harassment, insecurity and lack of support from colleagues and superiors are all associated with a low of WAI score [15, 25, 26, 27].

Thus better stress control, workplace organization, workstation layout and application of ergonomics rules could prevent the deterioration of work capacity of employees with RA. [28]

This work capacity not depended only on socio-demographic and occupational factors but also on clinical factors. It was negatively impacted by a high number of comorbidities, mental, cardiovascular disease, or others musculoskeletal disorders [16, 20, 22, 28, 25]. The same was noted for patients with a high BMI [25, 26, 29, 30].

The assessment of impact of RA on occupational activity, showed often a negative effect of RA on labor: the stopping of work among half of our patients attests the degree of this problem. Also, Verstappen et al. reported a risk of work disability in RA patients more higher to other inflammatory rheumatism raisons, as it is 49% versus 39% for psoriatic arthritis and 41% for ankylosing spondylitis. [31]

In Morocco, a prospective and longitudinal study was carried out by Rkain et al. [32] noted that 64.7% of patients stopped their work after an average duration of 6.9 years. According to Wei Zhang et al. the incidence of definitive stopping was 8.5%, 5.4%, 3.3% and 1.4%, respectively, at 12, 24, 36 and 52 months of disease progression [33]. In De Buck's study, this rate was 7%, 33%, 42%, 43% at 6, 12, 18 and 24 months respectively [34]. This rate increases from 35% at 5 years, 39% at 10 years to 44% at 15 years of evolution in the study of Eberhardt et al. [35]

In our study, half of the study population stopped their occupational activities and most of them (72%) occurred beyond the first five years of the disease. The differences between these rates and those reported in the literature could be explained by several factors, in particular socio-economic differences between countries: differences between sectors of work, unemployment rate, reintegration programs of the sick and structure of social security systems...

The process of disability and work stoppage is a complex process involving factors related to RA and external factors independent of the disease. [36]

Factors related to work stoppage found in our series were the sector of activity, the means of transport used between place of residence and that of work and the occupational category. Psychosocial and physical constraints, such as hours of work and physical laborious or manual work, were predictive of stops [14, 31, 35], but for Lacaille et al [37] being an employer, ergonomic changes in the workplace, the importance of work, family support for employment, lack of transportation problem to and from the workplace and comfort by informing colleagues about the disease were protective against work stoppages.

3- **Conclusion:**

Loss of work among patients with RA is a multifactorial and complex phenomenon involving socio-demographic, clinical and other parameters related to professional environment. It appears that age, educational attainment; physical and psychosocial constraints and HAQ score are the most important determinants of work stoppage. A better understanding of these factors could prevent job loss of patients with RA. In our study, it was not possible to identify all these factors that could be due to the small size of the population.

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Table 1: Sociodemographic, clinical and occupational predictors of work stoppage of patients with RA in univariate analysis.

		Working stoppage	Still working	p
Age (years)	< 40	2	4	0.023
	≥ 40	23	21	
Academic level	Illiterate	2	4	0.033
	Primary level	13	5	
	Secondary level	9	11	
	University level	1	5	
Means of transport	On foot	19	10	0.01
	Individual means of transport	2	5	
	Others	4	10	
Sector of activity	Manufacturing	17	6	0.02
	Other	8	19	
Professional Categories	Officials	2	13	0.01
	Employee	20	9	

	Other	3	3	
Disease duration (years)	Evolution ≤ 5	7	6	0.012
	Evolution >5	18	16	
Joint Deformities		12	9	0.031
HAQ	< 0,5	2	4	< 0,01
	≥ 0,5	23	21	

Table 2: Predictive factors of working stoppage in multivariate analysis.

	p	B	IC
Means of transport	0.004	0.288	{- 0,12 ; 0,592}
Sector of activity	< 0.001	0.171	{- 0,226 ; 0,572}
Professional Categories	0.01	- 0.169	{- 0,57 ; 0,21}
Coxopathy	0,041	- 0,22	{-1,007 ; 0,144}

Tableau 3: Predictive factors of work capacity in univariate study.

		WAI				P
		Low	Moderate	Good	Excellent	
Repetitive gestures of wrists.		4	0	0	0	0.039
Hyper extension / Hyper flexion of wrists		4	0	0	0	0.039
Duration of desease (years)	Evolution ≤ 5	4	1	0	1	0.024
	Evolution >5	8	7	4	0	

Tableau 4: Predictive factors of work capacity in multivariate analysis.

	p	OR	IC
Profession	0.005	0.125	{-3.726 ; 7.878}
Hyper extension / Hyper flexion of wrists	0.036	0.112	{-4.449 ; 9,428}
Repetitive gestures of wrists.	0.036	0.116	{-12.06 ; 6.92}
HAQ	0.001	- 0.113	{-5.38 ; 2.899}

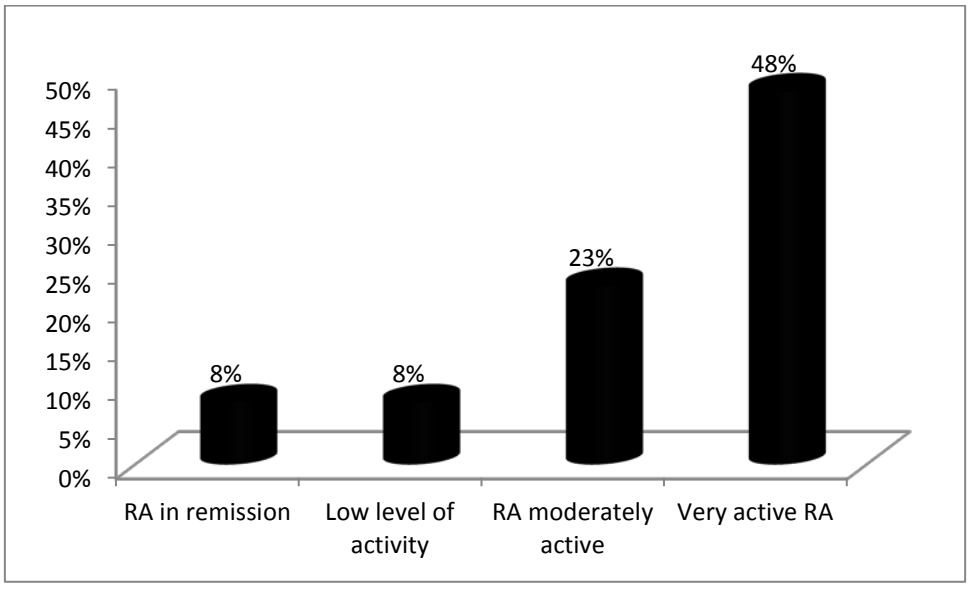

Figure 1: Distribution of study population according to activity level of RA