Early retirement attributed to rheumatoid arthritis and its predictors

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ABSTRACT

Objective: To evaluate the rate of early retirement due to rheumatoid arthritis (RA) in Portugal.
Methods: Prospective cohort study involving 11 Portuguese centers, including patients with a clinical diagnosis of RA, based on the Reuma.pt registry, enrolled between 2008 and 2019.
Results: 3231 patients were included (81.5% female, aged 60.8 ± 13.0 years, mean disease duration 18.0 ± 10.3 years). Until the present time, 37.6% of these patients retired, 59.6% due to RA. Early retirement due to RA translated into losing 7 years of active work when compared to patients retired due to other causes. Compared to professionally active patients, retired patients due to RA were diagnosed later in the disease process (p=0.003), had longer disease duration (p<0.001), were more frequently positive for rheumatoid factor (p=0.043), had more frequently erosive disease (p<0.001), had a blue-collar occupation (p<0.001) and had a lower educational level (p<0.001). Independent predictors for early retirement due to RA were: delayed diagnosis (OR: 2.23; 95% CI 1.18-4.21/year, p=0.013), erosive disease (OR: 2.21 95% CI 1.54-3.16, p < 0.001), need for biologic therapy (OR: 1.32; 95%CI 1.01-1.73, p=0.045) and lower educational level (OR: 0.83; 95%CI 0.79-0.86/year, p<0.001).
Conclusion: RA is, itself, the leading cause of early retirement in RA patients, accounting for the loss of an average of 7 years of active work. Delayed diagnosis, erosive disease and lower educational level are the main predictors of early retirement associated with RA in this population.

Keywords: Early retirement; Rheumatoid arthritis; Exit from work; Economic impact; Work disability.

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INTRODUCTION

Work disability is an important consequence of Rheumatoid Arthritis (RA), contributing to the individual and societal burden of the disease. Despite the recent advances in the management of RA, work disability remains a major problem for working-age patients[1,2] .

Several studies tried to identify potential predictors of work disability and early retirement in RA patients[3-8]. The risk of work disability in RA has been associated not only with traditional clinical, radiographic and biological markers of disease activity and severity, but also with demographic, socioeconomic, vocational, functional and social policy variables such as older age, lower educational level, lower household income and physically demanding type of work[4,9,10] .

Scarce information is available regarding disease-related factors associated with early retirement. While early effective treatment has been shown to prevent work disability, severe morning stiffness has been pointed out as a major detrimental factor, especially for presenteeism, but not specifically for early retirement[5,8,9]. Regarding disease activity and function, disability assessed through Health Assessment Questionnaire (HAQ) score has proven to be a far better predictor than

separate indicators of inflammation (tender/ swollen joints and acute phase markers) or even radiographic damage (eg: erosions)[4].

However, most studies concerning work disability in RA have been conducted in North America and Northern Europe, and little is known about the employability and work disability in other countries, including Portugal. Considering the differences of economic, social and work policies between societies, the extrapolation of such results and the estimation of socio-economic impact in other countries is compromised.

In this study we aim to evaluate the rate of early retirement due to RA and its associated factors in a national cohort of patients.

PATIENTS AND METHODS

PATIENTS AND STUDY DESIGN

We conducted a multicenter prospective cohort study including patients with a clinical diagnosis of RA from eleven Portuguese rheumatology centers, scattered throughout the northern, central and Greater Lisbon regions. Patients retired prior to RA diagnosis, never-employed or with missing information on current work status were excluded.

All included patients were registered in the Rheumatic Diseases Portuguese Register, Reuma.pt, between 2008 and 2019, after their informed consent.

OUTCOME OF INTEREST

Early retirement was defined as being out of paid work, for any reason, before statutory retirement age for each professional career. Early retirement was considered as due to RA when the patient was retired for work disability mainly attributed to this disease.

The years of active work lost due to the RA were calculated by the difference between the mean retirement age of patients retired due to RA and the mean retirement age of patients retired for any other reason.

DATA COLLECTION

From Reuma.pt we collected self-report patient data regarding socio-demographic (age, gender, years of formal education) and work-related variables, including working status before and after RA diagnosis, occupation type at the time of retirement, year of retirement and cause for retirement. Occupation type was classified as white (professional, managerial or administrative work) or blue-collar (manual labor or physical work). RA-related clinical characteristics were recorded including: year of diagnosis, time until the diagnosis, rheumatoid factor, anti-citrullinated protein antibody, erosive disease, extra-articular manifestations and current and previous medication (including date of onset), with special interest in conventional synthetic and biological disease-modifying anti-rheumatic drugs (csDMARDs and bDMARDs, respectively). Need for biological therapy was defined as current or past therapy with bDMARDs, according to the assistant rheumatologist judgment.

STATISTICAL ANALYSIS

Descriptive characteristics are presented as means and standard deviation (± SD) for continuous variables and as proportions (%) for categorical variables. There was no imputation of missing data.

Comparison between patients retired due to RA and non-retired was performed through T-test or Chi-2 test, as appropriate. Variables with $p<0.05$ in univariate analysis, and other potential predictors considered as relevant by the researchers, were included in multivariable binary logistic regression (method Enter). One-way ANOVA analysis was used to determine the evolution of mean age of retirement, all-cause and due to RA, through the years.

Data were analysed using IBM® SPSS® Statistics, version 22.0 software. Statistically significant results were assumed for $p<0.05$, without correction for multiple testing.

RESULTS

Among the 7 666 patients with RA regularly followed at the participating centres, 3 231 patients were included in this study. The main reason for exclusion was missing information regarding patient working status (n= 3 944). Additionally, 491 patients were excluded for being already retired or unemployed by the time of RA diagnosis (Figure 1).

The population included was predominantly female (81.5%), with a mean age of 60.8 ± 13.0 years-old and a mean disease duration since diagnosis of 18.0 ± 10.3 years. Clinical and demographic characteristics of the study population are presented in Table I.

Compared to the patients included in the analysis, excluded patients had similar gender distribution (female 79.0%) and were older (67.1 ± 14.5 years-old).

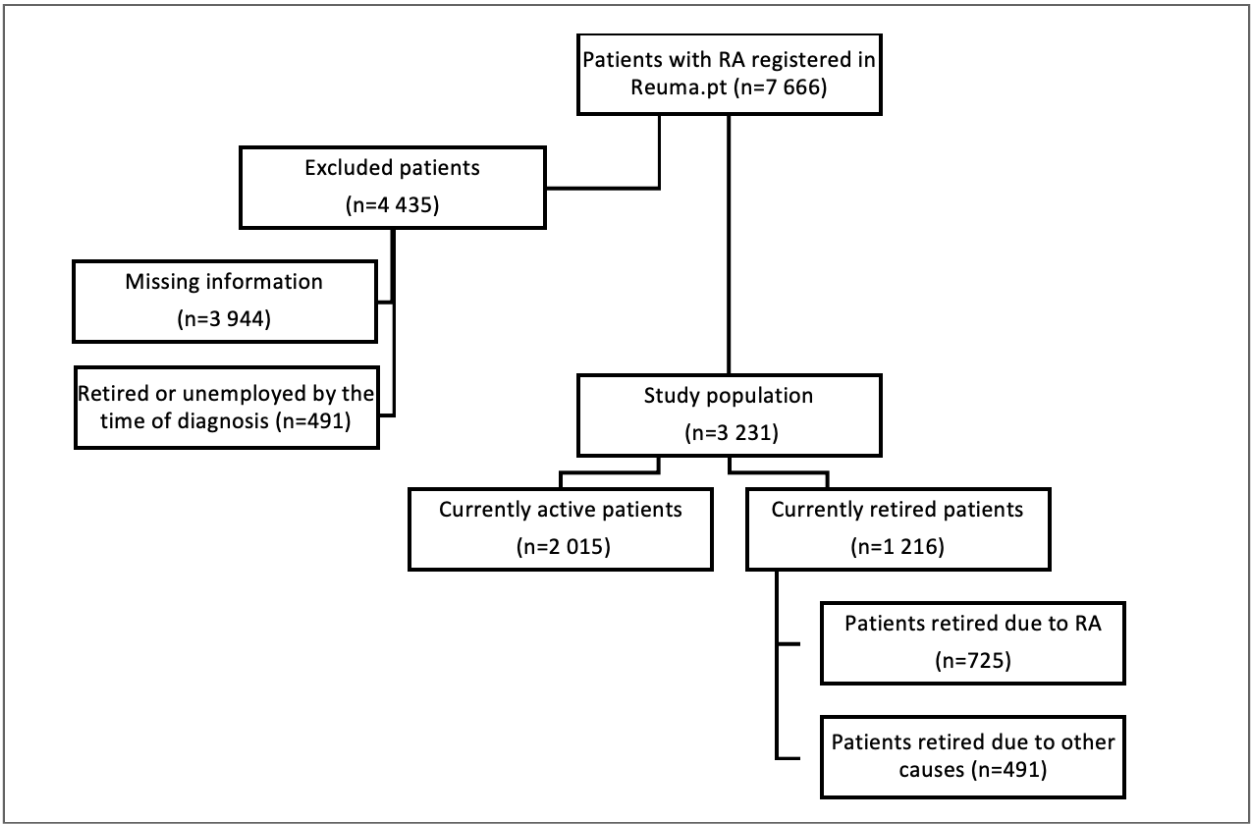

FIGURE 1. Flowchart of the study population.
RA: rheumatoid arthritis

At the time of evaluation, 37.6% (n=1 216) of all these patients were retired, this being due to RA itself in 59.6% (n= 725) of cases. Early retirement due to RA is translated into 7 years of active work lost when compared to patients retired due to other causes (49.6 ± 9.5 vs. 56.6 ± 9.8 years). Mean age of retirement among RA patients, both all-cause and due to RA itself, has steadily increasing in recent years, as shown in Figure 2.

Compared to patients who are still professionally active, patients retired due to RA were more likely to present: i. longest delay in diagnosis (2.7 ± 4.6 vs. 2.0 ± 4.1 years from first symptoms to RA diagnosis, p=0.003), ii. longer disease duration (24.8 ± 10.4 vs. 15.0 ± 8.8 years at the time of retirement, p<0.001), iii. positive rheumatoid factor (75.9% vs. 71.9%, p=0.043), iv. erosive disease (83.9% vs. 56.7%, p<0.001), v. blue collar occupation (58.1% vs. 41.9%, p<0.001) and vi. shorter formal education (5.0 ± 2.8 vs. 8.7 ± 4.5 school-years, p<0.001).

After multivariate analysis, the following factors remained as independent predictors for early retirement due to RA: delayed diagnosis, erosive disease, need for biologic therapy and shorter formal education. Although a blue-collar occupation was associated with a higher prevalence of early retirement, this association did not stand after adjusting for educational level (Table II).

DISCUSSION

This study shows that almost 60% of patients with RA who retired early, actually retired due to the disease itself leading to a loss of several years of paid work, which represents a high burden of disease for both patients and society.

Besides work related factors, more severe disease and delay in diagnosis were important factors associated with early retirement in our study, in accordance with

TABLE I. CLINICAL AND DEMOGRAPHIC CHARACTERISTICS OF THE STUDY POPULATION

	Early retired due to RA (n=725)	Non-retired (n=2015)	p
Socio-demographic features			
Current age (mean ± SD, years)	67.7 ± 9.7	55.6 ± 11.8	< 0.001
Retirement age (mean ± SD, years)	49.6 ± 9.5	NA	NA
Gender (female, %)	84.4	82.4	0.249
Disease-related features			
Age of diagnosis (mean ± SD, years)	44.6 ± 12.2	42.7 ± 12.2	0.001
Disease duration (mean ± SD, years)	24.8 ± 10.4	15.0 ± 8.8	< 0.001
Time until diagnosis (mean ± SD, years)	2.7 ± 4.6	2.1 ± 4.1	0.003
Rheumatoid factor (%)	75.9	71.9	0.043
ACPA (%)	73.7	72.6	0.679
Erosive disease (%)	83.9	56.7	< 0.001
Biological therapy (%)	47.3	43.1	0.055
Work-related features			
Occupation type (blue collar, %)	58.1	41.9	< 0.001
Educational level (mean ± SD, school-years)	5.0 ± 2.8	8.7 ± 4.5	< 0.001

Legend: ACPA: anti-citrullinated protein antibody; NA: non-applicable SD: standard deviation; RA: rheumatoid arthritis.

FIGURE 2. Evolution of the mean age of retirement of RA patients over the years

pre-existing literature[11]. Another relevant point is the persistence of delayed diagnosis and erosive disease (both disease modifiable factors) as predictors of early retirement opposed to disease duration (non-modifiable factor), in multivariable analysis. This increases our responsibility, as health care professionals, towards patients' future disability. Delayed diagnosis leads to delayed implementation of DMARD therapy with a consequent loss of the so called "window of opportunity". Such delay has been associated with poor outcomes, including loss of work productivity[2, 4, 9]. Erosive disease and the need for biologic therapy, on the other hand, reflect more aggressive disease, with more severe symptoms and damage, and subsequent disability leading to early retirement. The progressive increasing in the mean retirement age of RA patients over the years is the final proof of RA treatment evolution and efficacy. A multicenter Finnish study found HAQ score to be a better predictor of work disability compared to more objective markers of inflammation, such as swollen joint count and erythrocyte sedimentation rate, and of damage, like the presence of erosions[4]. These findings

TABLE II. MULTIVARIABLE ANALYSIS: PREDICTORS OF EARLY RETIREMENT DUE TO RA

	OR	95% CI	p
Gender (female)	1.18	0.79-1.77	0.406
Delayed diagnosis (years)	2.23	1.18-4.21	0.013
Positive rheumatoid factor	0.91	0.64-1.30	0.595
Erosive disease	2.21	1.54-3.16	< 0.001
Need for biologic therapy	1.32	1.01-1.73	0.045
Shorter formal education (years)	0.83	0.79-0.86	< 0.001
Blue-collar occupation	0.82	0.65-1.03	0.093

OR: odds ratio; CI: confidence interval

do not contradict ours, since functional disability assessed through HAQ is the ultimate consequence of symptoms associated with active disease as well as of more damage in the long-term. Unfortunately, HAQ performance was not evaluated in our study due to the high number of missing values.

In univariate analysis, having a blue-collar occupation was found to be associated with early retirement due to RA. However, this association does not stand when adjusting for possible confounding factors, especially educational level, in the multivariable analysis. A likely explanation is that a lower educational level often results in a more physically demanding occupation and more difficulties in healthcare access, therapeutic compliance, implementation of measures of rehabilitation and adaptation of work conditions to the patients' needs. In fact, a Canadian study found self-employment, adaptation of workstations, greater family support and increased job autonomy to be associated with decreased work disability in RA patients[3]. Other authors pointed out the importance of a flexible schedule as a measure to reduce presenteeism, especially in patients with more severe morning stiffness[5,7,8,12].

It is important to notice that most studies conducted on the subject consider a broader concept of work disability than merely early retirement. Work disability, including sick leaves and disability pensions, vary greatly across countries according to their social and economic policies and so precaution must be taken when extrapolating from international information available.

As far as we know, this is the first study regarding early retirement rate due to RA in Portuguese patients. National information available on this topic mostly comes from studies regarding the socioeconomic burden of rheumatic diseases in Portugal[13-15] and data from the EpiReumaPt initiative[16], a national population-based epidemiological study of rheumatic diseases in Portugal. However, these studies focus on rheumatic diseases as a whole and not RA specifically. Another strength of our study is the representativeness of the national reality due to the inclusion of centres scattered over several regions of the country.

Our study has some limitations. First of all, patients without updated information on their working status or type of occupation led to the exclusion of nearly half of the initial cohort. This information, particularly retirement year, when present, was self-reported and not confirmed through social security data, carrying a considerable risk of recall bias. While we only evaluated the rate of early retirement, we speculate active RA patients to have also high rates of presenteeism, absenteeism and other types of work disability. However, these are more difficult to document and to prove in our setting since this information in not available in the registry. Information on comorbidities which can contribute to patients' disability to work, as depression and anxiety, were not took into account. Although quite prevalent among patients with RA, we found them too subjective and heterogeneous with a too wide a spectrum in terms of severity, carrying a high risk of inducing bias in the multivariable analysis. Additional limitations include lack of data on function assessment (HAQ score) and on quality of life as well as absence of a formal assessment of radiographic damage. Further studies should consider the potential impact of patient reported outcomes, such us functional impairment and quality of life, in work disability.

In conclusion, RA itself is, at present, the leading cause of early retirement in Portuguese RA patients, being responsible for the loss of an average of 7 years of

work. Diagnosis delay, presence of poor prognosis factors (such as erosive disease and the need for biological therapy) and lower educational level are the main predictors of early retirement associated with RA in Portugal. Understanding the reasons of early retirement could lead to implementation of strategies to reduce the social and individual burden of RA.

CONFLICT OF INTEREST

The authors declare they have no financial conflicts of interest to disclose nor have received any financial support or other benefits from commercial sources for the work reported on in the manuscript.

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REFERENCES

1. Manders SH et al. Determinants Associated with Work Participation in Patients with Established Rheumatoid Arthritis Taking Tumor Necrosis Factor Inhibitors. J. Rheumatol 2014; 41:7
2. Martikainen JA et al. Longterm Work Productivity Costs Due to Absenteeism and Permanent Work Disability in Patients with Early Rheumatoid Arthritis : A Nationwide Register Study of 7831 Patients Longterm Work Productivity Costs Due to Absenteeism and Permanent Work Disability. J. Rheumatol 2016; 43: 12.
3. Lacaille D, Sheps S, Spinelli JJ, Chalmers A, Esdaile JM. Identification of Modifiable Work-Related Factors That Influence the Risk of Work Disability in Rheumatoid Arthritis. Arthritis Care Res 2004; 51: 843–852.
4. Piirainen H, Group FT. Predictors of productivity loss in early rheumatoid arthritis: a 5 year follow up study. Ann. Rheum. Dis. 2005; 130–133.
5. Westhoff G, Buttgereit F, Zink A. Morning stiffness and its influence on early retirement in patients with recent onset rheumatoid arthritis. Rheumatology 2008; 980–984.
6. Stamm TA et al. Life Stories of People with Rheumatoid Arthritis Who Retired Early : How Gender and Other Contextual Factors Shaped Their Everyday Activities, Including Paid Work. Musculoskeletal Care 2010; 8: 78–86.
7. Bansback N et al. Factors associated with absenteeism , presenteeism and activity impairment in patients in the first years of RA. Rheumatology (Oxford) 2012; 51: 375–384.
8. Mattila K, Buttgereit F, Tuominen R. Influence of Rheumatoid Arthritis-Related Morning Stiffness on Productivity at Work: Results From a Survey in 11 European Countries. Rheumatol. Int. 2015; 35(11):1791-1797.
9. Puolakka K et al. Impact of Initial Aggressive Drug Treatment with a Combination of Disease-Modifying Antirheumatic Drugs on the Development of Work Disability in Early Rheumatoid Arthritis: A Five-Year Randomized Followup Trial, Arthritis Rheum. 2004; 50: 55–62.
10. Sokka T et al. Work disability remains a major problem in rheumatoid arthritis in the 2000s : data from 32 countries in the QUEST-RA Study. Arthritis Res. Ther. 2010; 12(2):1–10
11. Hallert E, Husberg M, Skogh T. Costs and course of disease and function in early rheumatoid arthritis : a 3-year follow-up (the Swedish TIRA project). Rheumatol. 2006; 45(3): 325-331
12. Mattila K, Buttgereit F, Tuominen R. Impact of morning stiffness on working behaviour and performance in people with rheumatoid arthritis. Rheumatol. Int. 2014; 34(12): 1751–1758.
13. Laires PA, Gouveia M. Association of rheumatic diseases with early exit from paid employment in Portugal. Rheumatol. Int. 2014; 34(4):491-502
14. Gouveia M, Laires PA, Canhão H. Indirect costs associated with early exit from work attributable to rheumatic diseases. Eur J Public Health 2015; 25(4):677-682
15. Laires P, Gouveia M, Canhão H. Interventions aiming to reduce early retirement due to rheumatic diseases. Acta Reumatol. Port. 2017; 3: 240–248.
16. Rodrigues AM, Gouveia N, Pereira L, Eusébio M, Ramiro S. EpiReumaPt – the study of Rheumatic and Musculoskeletal diseases in Portugal : a detailed view of the methodology. Acta Reumatol. Port. 2015; 40(2):110-124