Factors Associated with Permanent Work Disability in Mexican Patients with Rheumatoid Arthritis. A Case-Control Study

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ABSTRACT. ***Objective***. To assess factors associated with permanent work disability (PWD) in Mexican subjects with rheumatoid arthritis (RA).

Methods. From a database of 300 salaried workers with RA, we evaluated 35 cases that developed PWD. These cases were compared with 70 controls randomly selected from the same database who were active workers. The assessment included the following variables: sociodemographic, education, employment, and clinical characteristics of the disease. Logistic regression analysis was performed to adjust variables associated with PWD. Odds ratios and their 95% confidence intervals (95% CI) were computed.

Results. Factors associated with PWD in the unadjusted analysis were: lower education level (OR 3.27, 95% CI 1.28–8.49, p = 0.006), > 2 year delay in prescription of a disease modifying antirheumatic drug (DMARD) (OR 4.29, 95% CI 1.49–12.73, p = 0.02), joint prosthesis (OR 8.93, 95% CI 2.02–45.04, p < 0.001), severe radiographic damage (OR 3.33, 95% CI 1.20–9.46, p = 0.01), comorbidity (OR 7.54, 95% CI 1.94–34.25, p < 0.001), and positive rheumatoid factor (RF) (OR 3.53, 95% CI 0.98–13.76, p = 0.03). In the multivariate model PWD was predicted by lower education (OR 3.3, 95% CI 1.1–9.7, p = 0.03), positive RF (OR 4.9, 95% CI 1.2–19.7, p = 0.03), and delay in the prescription of a DMARD (OR 3.3, 95% CI 1.1–10.1, p = 0.04).

Conclusion. A low education level, positive RF, and delay in the use of DMARD are risk factors for PWD. Strategies to decrease rates of PWD should include an earlier treatment with DMARD. (First Release June 1 2006; J Rheumatol 2006;33:1247–9)

Key Indexing Terms:
RHEUMATOID ARTHRITIS — WORK DISABILITY
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Rheumatoid arthritis (RA) affects 0.3% of the Mexican population[1], leading to functional limitations and high rates of disability. Studies in Europe and the United States describe 3 groups of factors associated with work disability: characteristics of the disease[2], employment[2,3], and socio-educational variables[3,4]. However, differences in the system of healthcare provision among countries are also important determinants[5].

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In Mexico, the main healthcare system for salaried workers is covered by the Mexican Institute of Social Security (IMSS), a prepaid compulsory social insurance system for workers and their families[6]. IMSS covers payments for sick leave and permanent work disability (PWD) resulting from disease. Although a high proportion of Mexican workers with RA develop PWD, there is a lack of information about the characteristics associated with this outcome. Therefore, we evaluated the factors associated with PWD in Mexicans with RA.

MATERIALS AND METHODS

We conducted a case-control study in the rheumatology clinic of a secondary-care hospital in Guadalajara, Mexico (HGR-110, IMSS). From a database of 300 salaried workers with RA, 35 cases with PWD were compared with 70 randomly selected controls. Inclusion criteria were: RA [1987 American College of Rheumatology (ACR) criteria], age ≤ 18 years, and having salaried work before onset of RA.

Definition of cases. Cases with PWD were defined as members of the permanent labor force who left employment as a result of RA. Only patients with complete work disability (≥ 75% disabled) certified by the board of occupational medicine were included.

Controls. Controls were defined as patients with RA who were salaried workers at the time of the study onset, who had no reports of sick leave in the previous year.

All patients were interviewed for (a) sociodemographic variables, (b)

employment, and (c) disease characteristics. Patient charts were assessed for (a) characteristics at the time of their first visit with the rheumatologist: age, disease duration, ACR global functional status, Steinbrocker's radiographic damage, erythrocyte sedimentation rate (ESR), delay between the onset of RA and utilization of disease modifying antirheumatic drugs (DMARD), and (b) variables that developed during evolution of RA: rheumatoid factor (RF), joint prosthesis, extraarticular involvement, corticosteroid use, and comorbidity. Disease duration was determined as time from diagnosis of RA to the time of study onset (for controls), or until the time of PWD (for cases).

Statistical analysis. For univariate analysis we used chi-square test (comparisons between proportions) and Student t test (comparisons between means). Logistic regression analysis was performed to evaluate variables associated with PWD; covariates included: age, education level, disease duration, RF, and delay in the onset of treatment with a DMARD. Odds ratios and 95% confidence intervals (95% CI) were computed. Statistical significance was set at p value $\leq$ 0.05. Analyses were performed using SPSS 8.0.

Ethics. Our study was approved by the Research and Ethics Committee of the hospital (approval IMSS 2003–002–110–043).

RESULTS

Thirty-five cases with PWD were compared with 70 active workers with RA. Table 1 shows sociodemographic and job characteristics in both groups. Higher age and lower education level were both associated with PWD.

The lag time between disease onset and utilization of a DMARD was higher in PWD than in controls (109 mo vs 26 mo, respectively; $p < 0.001$). Table 2 shows results of the univariate analysis comparing disease characteristics. The variables associated with PWD were: delay in treatment with a DMARD (OR 4.29, 95% CI 1.49–12.73, p = 0.02), severe radiographic damage (OR 3.33, 95% CI 1.20–9.46, p = 0.01), joint prosthesis (OR 8.93, 95% CI 2.02–45.04, $p < 0.001$), positive RF (OR = 3.53, 95%CI: 0.98–13.76, p = 0.03) and comorbidity conditions (OR = 7.54, 95%CI: 1.94–34.25, $p < 0.001$). The main comorbidities for cases and controls were: hypertension (55% vs 23%, OR = 4.01, 95%CI: 1.55–10.52) and peptic ulcer disease (51% vs. 6%, OR = 17.47, 95%CI: 4.69–71.17).

Table 3 describes results of the adjusted analysis. After adjusting by disease duration of RA, and age, the factors associated with PWD were lower education level (OR = 3.3, 95%CI: 1.1–9.7, p = 0.03), positive RF (OR 4.9, 95% CI 1.2–19.7, p = 0.03), and delay in treatment with DMARD (OR 3.3, 95% CI 1.1–10.1, p = 0.04).

DISCUSSION

To our knowledge this is the first study in Mexico evaluating characteristics related with PWD in patients with RA. Our results show 3 major predictors of PWD: lower education level, delay in onset of DMARD therapy, and positive RF.

These findings are consistent with those in other populations. Lower education level is associated with lower income and more physically demanding jobs[7,8]. A delay in the onset of DMARD therapy is also a predictor of poor outcomes[9,10]. More recently, Puolakka, *et al*, have shown that an aggressive initial treatment with a combination of DMARD decreases lost productivity in RA[11]. Both education and delay in treatment are factors strongly associated because patients with lower formal education are more likely to delay seeking medical attention. These 2 characteristics had more impact on PWD than characteristics of disease severity except RF. The role of RF role as risk fact has been widely documented[3,12-14].

In Mexico about 45% of the population is covered by the IMSS. It is estimated that 1.38% of the workers have a PWD by any cause[15]. Therefore, our prevalence of PWD in RA (11.7%), if extrapolated to the general population, represents an important cost for Mexican society and their health system.

Our patients originate from an outpatient clinic of a secondary-care hospital; such hospitals constitute the main source of referrals of patients with RA to our institution; therefore, extrapolation of the results to other settings requires caution. Patients from a tertiary-care hospital usually are likely to have a greater number of determinants for PWD, increasing the risk for this outcome.

The major limitations of our study are those related to its retrospective design, including recall bias, or information

Table 1. Comparison of sociodemographic and work characteristics of in patients with permanent work disability (PWD) versus controls.

	Cases with PWD, n = 35	Controls without PWD, n = 70	OR	95% CI	p
Age, yrs, mean ± SD	51 ± 9	47 ± 10	—	—	0.05
Age ≥ 50 yrs, n (%)*	22 (65)	29 (41)	2.59	1.02–6.63	0.03
Male, n (%)	22 (63)	50 (71)	1.48	0.57–3.80	0.4
Unmarried, n (%)	17 (50)	24 (34)	1.92	0.77–4.80	0.12
Formal education, yrs, mean ± SD	6 ± 4	9 ± 5	—	—	0.001
Education ≤ elementary school, n (%)	24 (69)	28 (40)	3.27	1.28–8.49	0.006
† Manual workers, n (%)	18 (51)	33 (47)	1.35	0.54–3.36	0.50

* Age: At the time of certified PWD in cases or at the time of study in controls. † Manual workers: Engaged primarily in physical labor. SD: standard deviation. Chi-square test was used for comparison between proportions. Student t test was used for comparison between means.

Table 2. Comparison of disease characteristics in cases with permanent work disability (PWD) versus controls.

	Cases with PWD, n = 35	Controls without PWD, n = 70	OR	95% CI	p
Duration of RA, yrs mean ± SD	10 ± 7	8 ± 5	—	—	0.07
Delay in use of DMARD ≥ 2 years after RA onset, n (%)	25 (78)	30 (46)	4.29	1.49–12.73	0.02
Joint prosthesis, n (%)	10 (29)	3 (4)	8.93	2.02–45.04	< 0.001
Severe radiographic damage in hands*, n (%)	20 (67)	21 (38)	3.33	1.20–9.46	0.01
Positive rheumatoid factor at any time, n (%)	25 (86)	39 (64)	3.53	0.98–13.76	0.03
Global functional status, stage III–IV**, n (%)	11 (31)	15 (21)	1.68	0.61–4.61	0.26
Prednisone use for RA, n (%)	24 (71)	52 (77)	0.74	0.27–2.06	0.52
Comorbidity, n (%)	32 (91)	41 (59)	7.54	1.94–34.25	< 0.001
ESR ≥ 20 mm/h, n (%)	25 (76)	46 (71)	1.29	0.45–3.76	0.60
Extraarticular involvement, n (%)	20 (57)	33 (47)	1.49	0.61, 3.67	0.3

* Steinbrocker stage III or IV at first visit with the rheumatologist. ** Evaluated using 1991 ACR criteria. Chi-square for comparison between proportions. Student's t test for comparison between means. SD: standard deviation; DMARD: disease modifying antirheumatic drugs. ESR: Erythrocyte sedimentation rate at first visit with the rheumatologist.

Table 3. Factors related to permanent work disability in the multivariate model.

	Adjusted Model*		
	OR	95% CI	p
Education ≤ elementary school	3.3	(1.1–9.7)	0.03
Positive rheumatoid factor	4.9	(1.2–19.7)	0.03
Delay in use of DMARD ≥ 2 years after RA onset	3.3	(1.1–10.1)	0.04

* Variables were adjusted by disease duration and age.

unavailable in the clinical charts. Therefore, prospective followup studies assessing these factors are required to control these biases and support our findings.

In conclusion, lower education level, delay in the onset of DMARD treatment, and positive RF increase the risk for permanent work disability in Mexicans with RA. A better understanding of these factors is required in order to design healthcare strategies that decrease the rates of PWD in patients with RA and their effect on society.

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