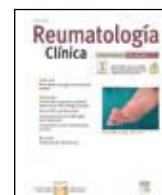




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## Original Article

### Characterization of patients with rheumatoid arthritis according to the health care level

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#### ARTICLE INFO

##### Article history:

Received June 29, 2008

Accepted November 11, 2008

Online May 6, 2009

##### Keywords:

Rheumatoid arthritis

Health care system

Population characteristics

Clinical characteristics

#### ABSTRACT

**Objective:** To characterize rheumatoid arthritis patients seen in rheumatology units at different health care levels.

**Material and methods:** Questionnaire and clinical examination of rheumatoid arthritis patients seen as outpatients in rheumatology units from primary care, county hospitals and reference hospitals. Demographic, social, labor, and disease data were collected. Statistical study included a description of the variables and a multiple correspondence analysis to define patient profiles.

**Results:** Eight hundred and twelve patients with rheumatoid arthritis were included. There were significant differences in patient profiles at the different care level. In primary care, patients were older, with basic studies, and with short duration and generally mild rheumatoid arthritis. In local hospitals the typical patient was a man, qualified worker, with low income, and an erosive disease with extraarticular manifestations. At reference hospitals prevailing patients were young women with a long duration disease and requiring biological therapy.

**Conclusion:** There are significant differences in rheumatoid arthritis patient profiles at different health care levels.

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### Caracterización de pacientes con artritis reumatoide según el nivel asistencial

#### RESUMEN

##### Palabras clave:

Artritis reumatoide

Sistema de salud

Características de la población

Características clínicas

**Objetivo:** Determinar las características de los pacientes con artritis reumatoide (AR) que acuden a consultas de reumatología en diferentes niveles asistenciales.

**Material y métodos:** Entrevista y evaluación clínica a pacientes con AR en consultas de reumatología de centros de especialidades, de atención primaria y de hospitales comarcales y de tercer nivel. Se recogieron datos generales, sociolaborales y de la enfermedad. Se realizó un estudio descriptivo y un análisis de correspondencias múltiples para establecer perfiles característicos.

**Resultados:** Se entrevistaron 812 pacientes. Se observaron diferencias significativas entre las características de los pacientes de cada nivel asistencial. En las consultas de reumatología de atención primaria predominan los pacientes de edad avanzada (mayores de 75 años), con estudios básicos y con un tipo de enfermedad de poco tiempo de evolución y, en general, poco grave. En los hospitales comarcales predominan los pacientes varones, obreros cualificados, con ingresos bajos, enfermedad erosiva y manifestaciones extraarticulares. En

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los hospitales de tercer nivel predominan las mujeres jóvenes con estudios, que padecen una enfermedad de larga evolución y que requieren tratamiento biológico.

**Conclusión:** Hay diferencias significativas en las características de los pacientes que acuden a cada uno de los niveles asistenciales.

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## Introduction

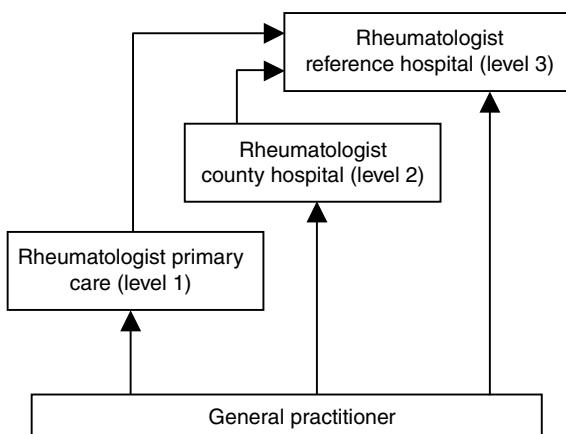
Medical literature has shown the existence of differences in treatment of different diseases (including rheumatic ones) between general practitioners and specialists, as well as the need for coordination between both levels of attention, the benefits of specialization in their treatment and the advantages of early remission in specialized care.<sup>1-5</sup> Differences in the characteristics of patients with knee osteoarthritis attended by specialists or general practitioners have also been proven,<sup>6</sup> and recently a study showing differences in the severity of patients with psoriatic arthritis cared for by different specialized levels of care has been published.<sup>7</sup> As a consequence of the changes in the organization of health care systems during the past decades, Cataluña has a unique organization structure in which both hospital specialists (county or second level hospitals and third level hospitals) as well as specialized in primary care provide attention to rheumatic patients. With regard to the availability of rheumatologic assistance in each county, the patient with rheumatoid arthritis (RA) can be sent from one level to the other (Figure). In zones with a rheumatologist in primary care or second level, only the more complex cases that cannot be adequately treated are sent to third level hospitals. Rheumatologic training of rheumatologists at all levels is similar, but there are differences in the availability of resources. Therefore, only hospitals have access to biologic therapy. In the context of a multicentric study on the quality of life of patients with RA, we analyzed the characteristics of patients with RA who are treated by rheumatology specialists in the 3 levels of attention.

## Objective

To know the characteristics of the patients with RA in each of the health care assistance levels.

## Material and methods

Primary care, county hospitals, and third level hospitals in all of Cataluña were selected to participate in the study, making sure



**Figure.** Flow of patients with rheumatoid arthritis in Cataluña.

they guaranteed a representative sample, taking into account both the level of assistance as well as the county in Cataluña where they are located and the fact that they reflect their sociodemographic variability. The size of the sample was determined according to the population census of 1999 for Cataluña (6 208 817 inhabitants), for a prevalence of 0.5%<sup>8</sup> with a 95% confidence interval. The minimum sample size calculated was 764 patients.

All consecutive patients with RA as classified by the ACR (American College Rheumatology)<sup>9</sup> who came for attention to their participating centers between August 2004 and January 2005 and who accepted to participate were included. We excluded patients with an onset of disease before 16 years of age, or those who had, additionally, another rheumatic inflammatory disease, severe comorbidity or mental health diseases. We collected general data from the patients included into the sample (age, gender, weight, height, body mass index), social and working information (schooling, living situation, profession, working status, monthly income, degree of economic independence, need for daily help with activities, time spent on health care, satisfaction with treatment), and disease information (time since onset of disease, comorbidities, morning stiffness, global health assessment, rheumatoid factor, presence of erosions, extraarticular manifestations, early radiological damage, DAS [disease activity score] 28, and treatments).

The statistical analysis consisted in a basic descriptive study for individual variables and a multiple correspondence analysis to study the relationship between the variables and establish the characteristic profiles. For the characterization of a qualitative variable, multiple comparisons between means and proportions of the subgroup were carried out, determined by the category under study and the global sample, a method that allowed us to know what characteristic of each variable differentiated the patient according to the assistance level in which they were seen.

## Results

Eight hundred twelve patients with RA from 5 rheumatology primary care units ( $n=218$ ; 26.85%), 6 county hospitals ( $n=287$ , 35.34%), and 2 third level hospitals in Cataluña ( $n=307$ , 37.81%) were interviewed. The characteristics of the population under study are shown on Table 1. Tables 2 and 3 detail the values of the variables in which there are differences that were statistically significant ( $P<.001$ ) between the RA patients treated at each one of these centers. In summary, primary care rheumatology sees older patients (over 75 years of age), with basic schooling, retired and with a shorter time since onset of disease and a less severe form of disease, with treatment satisfaction rated as enough. In the county hospitals rheumatology consult it is more frequent to see men, qualified workers, with low income, erosive disease and extraarticular manifestations, who commonly use non-steroidal anti-inflammatory drugs and steroids for their control and in a larger proportion than patients in other groups. In third level hospitals we found a predominance of women with schooling, who have long-standing disease and require biologic treatment. No differences were found between the assistance levels with relation to living situation, marital status, need for daily help, presence of comorbidities, secondary effects of treatment, functional status, presence of rheumatoid factor, treatment with disease modifying anti-rheumatic drugs or DAS 28.

**Table 1**

General characteristics of the population under study (shown as percentages if not otherwise specified)

Age, mean (SD), y	60.65 (14.22)
Gender (women)	78.8
Schooling (none; basic; medium; superior)	13.33; 43.02; 31.95; 11.70
Living situation (alone; with a partner; partner and family; with family; other)	12.58; 37.24; 33.87; 14.32; 1.99
Marital status (single; married; separated; widowed)	9.94; 67.95; 7.33; 14.78
Profession (professionals; administrative; services; qualified worker; non-qualified worker; others)	6.37; 5.37; 5.12; 3.50; 68.54; 11.11
Work status (works; unemployed; temporarily incapacitated; permanently incapacitated; retired; domestic work; other)	18.34; 2.89; 3.52; 20.10; 31.66; 20.48; 3.02
Monthly family income (<500; 501–1000; 1001–1500; 1501–2000; >2000), €	20.21; 35.93; 23.78; 11.76; 8.32
Economic independence	50.90
Need for daily help	53.19
Comorbidities (DM; COPD; HF; IHD; neurological disease)	6.20; 5.58; 4.96; 3.10; 2.23
Satisfaction with treatment (none; little; regular; enough; a lot)	0.87; 1.74; 11.46; 43.96; 41.97
Secondary effects of treatment	26.88
Time since onset, (SD), mo	133.52 (117.11)
BMI (SD), kg/m <sup>2</sup>	26.64 (4.47)
Functional status (I; II; III; IV)	33.16; 39.30; 23.80; 3.74
Positive rheumatoid factor	76.26
Erosive disease	63.90
Extraarticular manifestations	19.10
Early radiological damage	19.00
DMARD treatment	87.42
DMARD use over 4 years	67.12
More than one DMARD	56.47
DAS 28 (SD)	4.02 (1.38)
Treatments prescribed (NSAID+CE; DMARD; biologics)	87.32; 64.04; 10.71

BMI indicates body mass index; COPD, chronic obstructive pulmonary disease; DAS, disease activity score; DM, diabetes mellitus; DMARD, disease modifying anti-rheumatic drugs; HF, heart failure; IHD, ischemic heart disease; NSAID, non-steroidal anti-inflammatory drugs; SD, standard deviation.

## Discussion

There are studies that show the benefit of specialization in the treatment of different musculoskeletal diseases,<sup>1</sup> including RA,<sup>10</sup> which is the most prevalent inflammatory joint disease.<sup>8</sup> In addition, the importance of early detection on the part of primary care physicians and the effectiveness of their rapid referral to the rheumatologist has been recognized,<sup>11,12</sup> and referral criteria have been elaborated.<sup>13</sup> However, there are no studies comparing the type of attention provided for the same level of specialty in relation to available resources. In Cataluña, in the context of a global change in the structure of health care,<sup>14</sup> the existence of 3 assistance levels of rheumatology is due to the progressive conversion of specialized attention performed in specialty centers belonging to primary care centers to another model, in which specialized attention is provided through hospital services that may be performed in outpatient clinics of the same hospitals or in centers closer to the patients' homes. In this context, second level hospitals have been created and empowered as intermediate reference health providers. In this way, in some zones, the specialists who used to perform their job in primary care centers now depend on the hospital; this is accompanied by a change in resources, and that the county hospital serves as a buffer between the general practitioner and the third level hospital. However, there are still zones in which the referral from the family physician to the third level hospital is direct if no primary care or county hospital rheumatologist is available. In these cases, triage is performed in

the third level hospital in relation to the internal organization of the department.

This model is not exempt of controversy between those that support the proximity of the specialist to the patient and the general practitioner and those who consider that the centralization of specialties in hospitals allows us to save on resources. Studies on rheumatic disease patients' preferences (especially those with inflammatory disease) show that they would rather be seen in hospitals that are closer to their homes than in primary care centers.<sup>15</sup>

Differences in treatment of patients with rheumatic disease by rheumatologists have been described in different health care systems, without differences in prognosis.<sup>16</sup> To take advantage of this special circumstance and in the context of this quality of life study in patients with A, differences between patients coming to rheumatology clinics in different levels of attention have been analyzed. No study analyzing this same aspect has been performed, although Reina et al<sup>7</sup> have recently published a multicentric study that included patients with psoriatic arthritis seen by the 3 levels of health care, showing a worsening of the functional capacity in patients attended by the third level.

Patients of this sample adapt to the usual epidemiological distribution of RA: a predominance of women, mean age of 60 and the presence of rheumatoid factor in 76% of cases. The results obtained with relation to the disease are within the logic suggested for follow-up. Therefore, patients with more severe disease (longer time since onset of disease, with extraarticular manifestations, erosive forms, or early radiological damage) tend to be seen at hospital centers in which there are resources that would not be directly available in primary care, such as biologic therapy or other subspecialty care. In this way we explain why hospital patients are younger. We do not have a clear explanation of why there are no differences between the groups with relation to functional status or the degree of activity measured using DAS 28. This can be owed to the use of earlier biologic treatment in patients with more disease severity, which would reduce the global DAS 28 and avoid worsening of the functional status, or to the fact that patients in the first level of care have more complications and less inflammatory activity.

Social and working differences are not clear either. In a system with universal coverage and in which rheumatologic assistance is understood to be a continuing effort on behalf of the patient (with no limits in patient transferring from one level to the other), the existence of differences in relation to the degree of schooling, income or even gender, is difficult to explain. Because of the lack of studies that analyze similar data we consider that, in a degree of competence similar between rheumatologists, it is likely that the distribution between assistance levels is influenced by non medical factors such as the proximity of the patient's address (due to working arrangements in men and women, due to difficulties with transportation in the elderly or the availability of help for daily activities), rent (patients with lower rents go the centers which are nearer) or the level of schooling (patients with higher studies can be more inclined to ask for second opinions or to be sent to higher levels of attention when they have access to more information).

A worse prognosis is usually described in RA patients with a less than favorable socioeconomic situation.<sup>17</sup> In this study we observed that these patients (retirees with a low schooling level and reduced income) are mainly controlled by the lower rung of the rheumatologic attention ladder, with an acceptable degree of satisfaction and no significant differences in disease activity measured by DAS 28 when compared to other groups. This situation can be due, on one hand, to the ease with which patients can be transferred between levels and, on the other, to the fact that most of the rheumatologists of the public health system have received similar training, giving an elevated degree of homogeneity to rheumatologic assistance.

**Table 2**

Differential characteristics between assistance levels (categorical variables)

Variable	Differential categories	Level 1 <sup>a</sup>				Level 2 <sup>b</sup>				Level 3 <sup>c</sup>			
		A, %	B, %	C, %	P	A, %	B, %	C, %	P	A, %	B, %	C, %	P
Age	Older than 75 years	20.83	13.42	41.28	.000								
	36 to 45 years												
Gender	Man					27.62	21.18	45.93	.001				
	Woman												
Schooling	None												
	Basic	53.7	42.24	33.82	.000	17.48	13.05	47.17	.004				
	Medium												
	Superior												
Profession	Qualified worker												
	Professional					75.87	67.61	39.53	.000				
Work situation	Retired	37.96	31.03	32.54	.007								
	Works/other												
Monthly income	<500 €					27.27	18.84	50.98	.000				
	>2000 €												
Economic independence	No					53.85	47.17	40.21	.003				
	No					53.15	46.06	40.64	.002				
	Yes												
Satisfaction with treatment	Enough	51.85	43.47	31.73	.002								
	No	46.76	36.58	34.01	.000								
	Yes					69.23	63.42	38.45	.007				
Extraarticular manifestations	No	90.74	81.16	29.74	.000								
	Yes					26.92	18.84	50.33	.000				
Early radiological damage	No												
Treatment with steroids and NSAID	No	18.06	12.68	37.86	.005								
	Yes					92.31	87.32	37.24	.001				
Biologic therapy	No	96.3	89.29	28.69	.000								
	Yes												
						17.97	10.71	63.22	.000				

Only the results that show a significant difference with respect to the general group or the subgroups are shown. Blank spaces indicate no difference with the general group. A indicates percentage of the intragroup category (percentage of individuals in the category of the variable at the corresponding level); B, percentage of the total category (percentage of individuals in the category of the variable in the complete sample); C, percentage of the group in the category (percentage of individuals of the whole sample that are at their corresponding level); NSAID, non-steroidal anti-inflammatory drug; RA, rheumatoid arthritis.

Example: patients in level 1 are significantly different from the general group by having an age over 75, while in the level 3, the age group that significantly predominates is 36 to 45 years. In other words, in level 1, 20.83% of subjects are over 75 years, something significantly higher ( $P=.000$ ) than the percentage of persons of more than 73 in the complete sample (13.42%); in addition, in level 1 we found 41.28% of all of the patients with rheumatoid arthritis over 75 years of age.

<sup>a</sup> Primary care rheumatology.

<sup>b</sup> County hospital rheumatology.

<sup>c</sup> Reference hospital rheumatology.

**Table 3**

Differential data between assistance levels (continuous variables)

Variables	Level 1 <sup>a</sup>			Level 3 <sup>b</sup>		
	Mean of the category (SD)	Mean of the total (DE)	P	Mean of the category (DE)	Mean of the total (DE)	P
BMI	27.29 (4.59)	26.64 (4.47)	.007	25.85 (4.57)	26.64 (4.47)	.000
Time since onset, y	7.28 (7.82)	11.13 (9.75)	.000	13.65 (9.79)	11.13 (9.75)	.000

BMI indicates body mass index; SD, standard deviation.

Example: in level 1, patients have a body mass index that is significantly higher than the mean, contrary to what occurs in level 3.

<sup>a</sup> Primary care.

<sup>b</sup> Third Level Hospitals

The existence of differences in the use of biologic treatment is exclusively due to a logistical reason: they are not available to rheumatologists in primary care, obliging all of the patients that need these drugs to be derived to the next level of attention.

Finally, the existence of patients with different characteristics in each one of the health care levels shows the possibility that there is a bias in the representation of patients with RA when one considers only those that come from a reference hospital, as occurs in numerous studies.<sup>7</sup>

## Financing

This study was financed by the Fundación La Marató TV3 (n.º 30.510).

## Acknowledgments

The authors of this article wish to thank F. Segura, D. Buss, and R. Ortega for their help in the project and M.A. Parra, N. Rodríguez,

N.R. Sanmartí, J.D. Cañete, LL. Quintó, and M.J. Bertrán for their opinions.

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