Prevalence of Rheumatoid Arthritis in Tucumán, Argentina

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ABSTRACT. ***Objective.*** To ascertain the prevalence of rheumatoid arthritis (RA) in Tucumán, Argentina.
Methods. The study was conducted between January 1, 1998, and December 31, 1999, in Tucumán province in northwest Argentina. Outpatient and hospitalization medical records for all patients with RA aged ≥ 16 years were reviewed. Diagnosis was by 1987 American College of Rheumatology (ACR) criteria for RA and the population data were based on the 1991 national census. Prevalence rates, with 95% CI, were calculated using the number of San Miguel de Tucumán residents who fulfilled the 1987 ACR criteria for RA as numerator, and the city population aged ≥ 16 as denominator. Crude and age-specific prevalence rates were calculated as number of cases/1000 inhabitants.
Results. We identified 695 cases of RA. Sex-specific and overall prevalence rates (per 1000) were 1.97 (95% CI 1.8–2) for all, 0.6 (95% CI 0.49–0.73) for men, 3.2 (95% CI 2.9–3.5) for women.
Conclusion. Prevalence of RA is low in residents of Tucumán, Argentina, and comparable with rates observed in epidemiological surveys from Southern European countries. (J Rheumatol 2002;29:1166–70)

Key Indexing Terms:
EPIDEMIOLOGY PREVALENCE RHEUMATOID ARTHRITIS

Rheumatoid arthritis (RA) is a chronic systemic inflammatory rheumatic disorder of unknown etiology, characterized by symmetric polyarticular inflammation, including small, medium, and large joints of upper and lower extremities. There are, however, no descriptive epidemiological data for RA in Argentina as a whole or for any of its regions. The same is true for other Latin American countries.

Epidemiological studies have consistently shown that the overall prevalence of RA is about 1% in adult Caucasian populations[1,2], but there is a wide range of rates that varies from a low of 0.2% to a high of 5.3%[3,4] worldwide. Moreover, RA shows a geographical trend, with higher prevalence in the Northern hemisphere (and more developed countries) than in the Southern hemisphere (and developing countries)[5].

We report the first descriptive epidemiological study carried out in Tucumán, a province located in the northwest region of Argentina.

MATERIALS AND METHODS

Tucumán is the main economic and cultural province in the northwest region of Argentina, located about 720 miles from Buenos Aires. San Miguel de Tucumán is the capital of the province. According to a projection based on the 1991 national census, San Miguel de Tucumán comprises 540,843 inhabitants; 352,089 of them are aged 16 years and over. The large majority of city dwellers (about 84%) are predominantly of European descent (Spanish and Italian predominantly, but also French, Irish, and German); about 10% are Indigenous people and 7% are from Middle Eastern countries. A small percentage of the city population cannot trace its ancestors (4%).

This study was conducted between January 1, 1998, and December 31, 1999, in San Miguel de Tucumán by 19 resident rheumatologists, all members of the Tucumán Rheumatology Society.

Outpatient and hospitalization medical records for all patients with RA being followed at either private or community (hospital) practices were reviewed by the 3 project rheumatologists (AS, AB, EL). Confirmation or rejection of the diagnosis of RA was based on the 1987 American College of Rheumatology (ACR; formerly, the American Rheumatism Association) classification criteria[6]. Duplicate records (the same patient at more than one practice) were deleted. Variables [sex, age at diagnosis of RA, duration of followup, use of contraceptive or hormonal replacement therapy, presence of rheumatoid factor (RF), and radiographic changes] were either extracted from available medical records or determined specifically for this study. RF was determined by sheep cell agglutination test (SCAT) or latex fixation test. Subjects with SCAT titer ≥ 1:32 and/or latex ≥ 1:160 were considered to be seropositive. Radiographs of the hands and wrists were read by all 3

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Supported by a grant from the Dr. Samuel Spindler Foundation.

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Submitted June 27, 2001; revision December 6, 2001.

investigators, using the Steinbrocker method[7]. The earliest date at which a patient fulfilled ≥ 4 ACR classification criteria for RA was used to define prevalence. Patients with permanent residence outside the city limits were excluded. Prevalence rates, with 95% confidence intervals, were calculated using the number of San Miguel de Tucumán residents who fulfilled the 1987 ACR criteria for RA as numerator, and the city population age 16 and older as denominator. Crude and age-specific rates were calculated as number of cases/1000 inhabitants.

RESULTS

During the study period 695 cases of RA were identified. The main clinical and demographic features are shown in Table 1. The large majority of the patients were women (~ 86%), with a mean age (± SD) at diagnosis of 45.2 years (± 13.7) and disease duration of ~ 8 years. Although the large majority of the patients were seropositive for IgM–RF, only 24% (of 451 patients with available radiographs) had erosive disease. The ethnic distribution of the cases is shown in Table 2; the large majority of the patients (~ 84%), like the general population of Tucumán, were of European descent and only about 10% were primarily descendants of the Indigenous people of the area.

Sex-specific and overall prevalence rates (per 1000 inhabitants) are shown in Table 3. These data are 1.97 (95% CI 1.8–2) for all, 0.6 (95% CI 0.49–0.73) for men, and 3.2 (95% CI 2.9–3.5) for women. Age-specific rates are shown in Figure 1. As can be appreciated the peak prevalence rate in women occurs at age 36–45 whereas the peak occurs later in men (age 46–55). When data for both sexes are combined, the prevalence rate increases steadily with age. These data are depicted in Figure 2.

Table 4 shows prevalence data for RA for different population groups worldwide, our study included. As can be seen, the rates for Tucumán reveal a population with a low prevalence of RA.

Table 1. Sociodemographic and clinical features of RA patients from San Miguel de Tucuman, Argentina, age 16 and older, diagnosed between January 1, 1998, and December 31, 1999.

Feature	
Female, n (%)	596 (85.7)
Female/male ratio	6:1
Mean age at diagnosis, (yrs ± SD)	45.2 ± 13.7
Mean disease duration, (yrs ± SD)	8.4 ± 7.7
Seropositivity for IgM-RF, %	84
Erosive disease, %	24
Hormonal replacement therapy and oral contraceptive use, %	6
Total no. of patients	695

Table 2. Ethnic origin of RA patients from Tucumán.

Ethnic Group	Percentage
Spanish*	60
Italian*	17
French*	7
Native American	10
Unknown	4
Other	2

* Approximately 84% of patients are of European ancestry.

DISCUSSION

This is the first study evaluating the prevalence of RA in a region of Argentina: a prevalence of 1.97 per thousand was found. Our results are consistent with data from studies from Southern Europe[3]. If we consider the ethnic origin of the population of Tucumán (84% from Southern European countries) and the relatively small contribution of Indigenous ancestry, these data are not surprising. Indeed, RA is quite prevalent among some Native American tribes, such as the Yakima, Chippewa, and particularly among the Pima Indians of Arizona[4], but much less frequent in Southern European countries. It is possible that a small number of RA cases were missed; however, in our city, patients that are diagnosed with arthritis, of any cause, either by general practitioners and/or by orthopedic surgeons, are referred to a rheumatologist for further evaluation. We chose not to include patients from such practitioners since they use different methods for the ascertainment of clinical data, and the patient's final diagnosis may be less precise.

Our cross-sectional study does not allow us to determine whether there is a temporal decline in the prevalence and incidence of RA[9-12]. One explanation given for the temporal decline in RA is the use of postmenopausal hormone replacement therapy and oral contraceptives[13,14]. The use of these therapies in our population was quite small; however, the general improvement in living standards that has been put forward to explain this trend[15] is contradictory and cannot be applied to our population because Argentina is not a developed country. Data gathered prospectively from the Norfolk Arthritis Register in the UK have shown no association between RA and social class or other indicators of socioeconomic status[16]. It has been postulated that a shorter life expectancy with the consequent broad based triangular age distribution in some Asian and African populations may partially explain the low prevalence rate observed in these populations (fewer subjects at risk of developing the disease)[17]. This hardly applies to our population since most of our patients are over 60 years of age; moreover, as in many other studies we observed age-specific prevalence rates that increase with age[18].

Environmental factors may affect the clinical expression of RA (and even its occurrence). Factors studied include climate, smoking, ultraviolet light, and dietary habits (fatty acid source, meat consumption). Omega-3 fatty acids from fish oil and some plants have been found to be antiinflammatory and thus may ameliorate the expression of RA[19,20]. Although this was not specifically investigated, we doubt

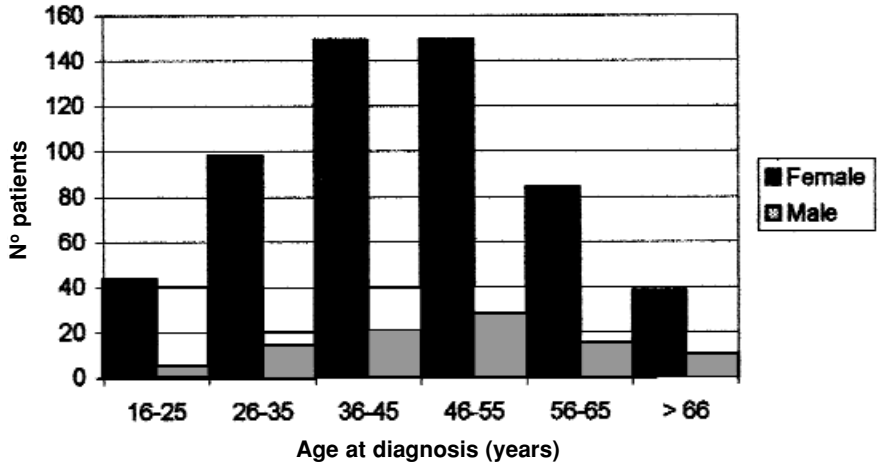

Figure 1. Number of patients with RA by sex. RA prevalence in women is constant.

Table 3. Total and sex adjusted prevalence of RA in San Miguel de Tucumán, Argentina (prevalence rate per 1000 inhabitants).

	per 1000 Inhabitants	95% CI
Total prevalence	1.97	1.8–2
Female	3.2	2.9–3.5
Male	0.6	4.9–7.3

that dietary factors (total calories, food categories and preferences) are responsible for the low prevalence of RA in Tucumán, since the average diet is not weighted toward the consumption of food containing omega-3 fatty acids. Smoking has been reported inconsistently to be associated with more severe RA disease[21,22]. Whether smoking could be responsible for the increased frequency of RA among the women in our study can only be speculated since this habit was not systematically explored in our patients.

It has been reported that ultraviolet light can be immunosuppressive[23]. Tucumán has a subtropical climate; this environmental factor, therefore, could be a factor to explain the relatively low prevalence of RA found in our study.

Table 4. Prevalence of RA in diverse population groups worldwide.

	Place	Prevalence, %		
		Male	Female	Combined
Del Puente[4]	Arizona, USA*	nil	53	nil
Gabriel[20]	Minnesota, USA	7	13	10
Solomon[8]	Urban Soweto, South Africa	nil	14	9
Saraux[21]	Brittany, France	3.2	8.6	6.2
Oen[22]	Alaska, USA**	nil	18	nil
Moolenburgh[23]	Rural Lesotho, South Africa	nil	4	3
Simonsson[24]	Halland, Sweden	nil	nil	5.1
Cimmino[25]	Chiavari, Italy	1.3	5.1	3.3
Drosos[26]	Ioannina, Greece	2	4.7	2.3
Stojanovic[3]	Belgrade, Yugoslavia	0.9	2.9	1.8
This study	Tucumán, Argentina	0.6	3.2	2

The studies were done in Pima Indians* and in Inuit**.

The apparent paradox between the high frequency of IgM–RF and the low frequency of erosions in our study may

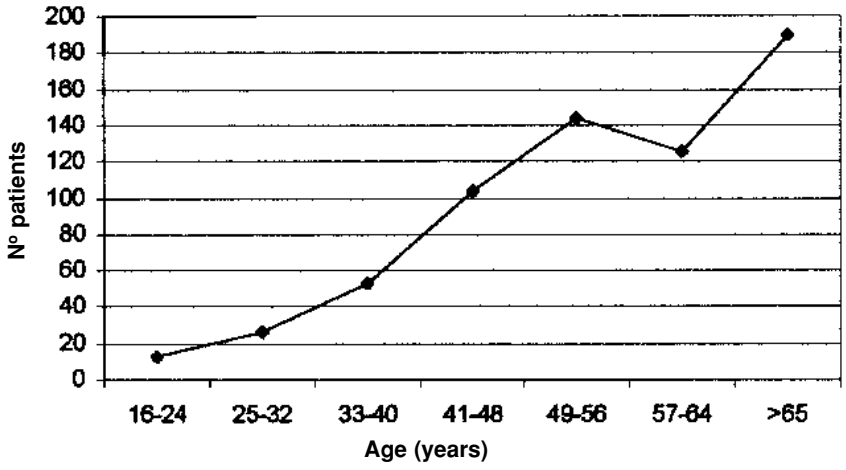

Figure 2. Age-specific cumulative prevalence rates rise with age.

relate to the relatively low levels of IgM–RF in our patients; it is also possible that the paucity of erosions could be due to the relatively early use of methotrexate in our patients. It should be noted that the frequency of erosive disease in our patients is comparable to data from Nissillä, *et al*[24], who found that 27% of 163 patients developed erosions at 3 years. Other studies from Southern Europe are consistent with these data (joint erosions were found in 16 to 29%)[25,26].

Studies have shown that HLA-DRB1 alleles encoding the so-called rheumatoid epitope are strong predictors of radiographic damage in early RA[27,28]; however, the role of HLA-DRB1 genes in the severity of RA remains controversial[29,30]. Our study did not include HLA-DRB1 typing; thus, we cannot speculate about the role of HLA-DRB1 alleles (particularly of the rheumatoid epitope) in erosive disease in our patients. Data from Argentina recently reported by Citera, *et al* did not reveal the role of the rheumatoid epitope in disease severity[31].

Most studies show a female to male excess of between 2 and 4 times in RA. In this study RA was 6 times more common in women than in men; the basis for the excess of RA in women relative to men in Tucumán remains unexplained. Other findings in our patients, such as peak age at diagnosis and the percentage exhibiting RF positivity, are similar to findings in other populations[17].

We conducted the first descriptive epidemiological study of RA in Argentina, and we found a relatively low prevalence of the disease; this is consonant with findings from Southern European countries, where about 84% of the population of Tucumán originates; other factors (such as ultraviolet light exposure) could be contributory to the low prevalence of RA in Tucumán. The relative higher prevalence of RA in women compared to men cannot be explained now and deserves to be investigated further.

ACKNOWLEDGMENT

The authors sincerely appreciate the invaluable comments and encouragement of Dr. Graciela S. Alarcón.

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