Research Article

Sociodemographic evaluation of patients with rheumatoid arthritis in the state of roraima, extreme north of Brazil: A descriptive study

Abstract

Rheumatoid arthritis (RA) is a chronic systemic autoimmune inflammatory disease. Consequently, the need for observational research, which aims at a quantitative/descriptive approach based on documentary and field research with the intention of analyzing the prevalence and incidence of rheumatoid arthritis in Brazil, especially in the state of Roraima, which are scarce. The aim of this study is to analyze the prevalence and incidence of rheumatoid arthritis in the state, as well as other epidemiological aspects such as the profile of patients. That said, 150 participants were obtained, of which women represented 92,0%. The most patients were between 50-59 (34.7%) and 60-69 (29.3%) years old, and also most declared themselves to be brown (82,0%). It was demonstrated that 65.3% of the patients were not born in the state, and 79.3% live in the urban area. In addition, the declared mean education level was complete high school (38%), and 63.3% of patients as well are unemployed. As for family income, 45.4% is between 1 and 3 minimum wages. Evidently, it is possible to relate advanced age, low income and lack of higher education with the prevalence of RA, as factors such as lack of knowledge reduce the haste with which the patient seeks health services, and low income also makes it impossible to pay for health privately, which offers faster services. Therefore, resident rheumatologists and civil servants in the city state claim that the number of patients with RA can reach up to twice the number of respondents, so the need for multicenter studies with large samples of patients over the years is evident.

Keywords: rheumatoid arthritis, epidemiology, brazil, roraima

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Introduction

Rheumatoid arthritis (RA) is an inflammatory, autoimmune and chronic disease.[1] The synovial membrane becomes main target, in which its clinical landmark is symmetrical erosive polyarthritis of small and large joints, and may affect other organs.[1] It is worth noting that the interaction of environmental factors in predisposed individuals is responsible for the loss of immunological self-tolerance, although the pathological mechanisms of autoreactive autoantibodies, CD4+ T cells, B cells, macrophages and others that cause RA are not well understood, as this early overview RA, the article examines the needs and challenges of diagnosing RA.[1,2]

In September 2010, since then, the perceptive criteria of the American College of Rheumatology-European League Against Rheumatism (ACR-EULAR) have been used with the aim of identifying RA early, even before the disease progresses, with irreversible joint damage. In addition to these joint involvement criteria (large joints and small joints), serology, the individual who presents six or more points (maximum value of 10) can already be classified as having RA (Table 1).[3]

In terms of epidemiology, RA varies globally over the last 30 years, generally with a greater proportion in industrialized countries, thus explanations can be taken for exposure to environmental risk factors, with smoking being the most important factor.[4,5] As well as relating to genes, the human leukocyte antigen (HLA) DRB1 is almost all associated. This is a receptor of the MHC class II family of molecules, present in antigen-presenting cells and responsible for presenting antigenic epitopes to T cells (via TCR receptor).[2]

Table 1 Classification criteria for rheumatoid arthritis (score-based algorithm: sum of scores from categories A-D). A score greater than or equal to 6 is required for definitive classification of a patient as rheumatoid arthritis

| Joint Involvement - A	Points
1 large joint	0
2-10 large joints	1
1-3 small joints, +/- large joints	3
>10 joints (al leats 1 small joint)	5
Serology (need at least 1) - B	
Negative RF, negative anti CCP Ab	0
Low positive RF or low positive anti CCP Ab	2
High positive RF or high positive anti CCP Ab	3
Acute Phase reactants (need at least 1) - C	
Normal CRP and normal ESR	0
Abnormal CRP or abnormal ESR	1
Duration of symptoms - D	
<6 weeks	0
>6 weeks	1

Source: Villeneuve E, Nam J, Emery P, 2010[3, p.2]

RF, rheumatoid arthritis; CCP Ab, cyclic citrullinated peptide antibody; CRP, C-reactive protein; ESR, erythrocyte sedimentation rate.

According to Radu AF, Bungau SG,[5] RA has been increasing almost unanimously since 1990 until today. In which it affects about 1% of the world's adult population, being one of the most common rheumatic diseases, with a predilection for women in a ratio of 3:1 men and peak incidence between 40 and 60 years, although it can occur at any age.[6] Nevertheless, it is stated that epidemiological studies

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on rheumatoid arthritis in Brazil are not easy to find or get, currently the data are mostly from international literature.[7–9] There are only six studies of clinical and/or epidemiological characteristics involving RA in Brazil. Noting that in the state of Roraima(RR), there has not yet been any work that sought to investigate epidemiological aspects of RA. This lack of data contributes to the scarcity of information at regional and national levels.

Thus, the quest to understand the incidence of RA in the state is of paramount importance in view of public health aspects and a better understanding of how RA behaves. Relating the population and cultural differences that Roraima presents, in relation to the rest of Brazil, with the forms of RA is an important challenge (Figure 1).
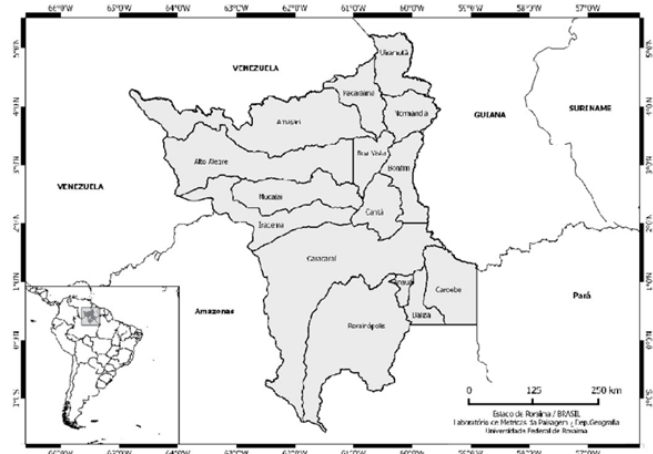
Figure 1 Location of the State of Roraima.

Source: Vector base of the Brazilian Institute of Geography and Statistics (IBGE), 2022.

Materials and methods

Population

Between the months of June and October 2021, 150 patients were included in the survey, due to the criteria of residents in Roraima with a diagnosis of RA, signing the term of consent or assent and patients who are in the age group between 14 and 70 years. In which the following participants were excluded: all immigrant patients who do not speak Portuguese, such as indigenous patients regardless of ethnicity, participants who do not accept signing the consent or assent term, and those outside the determined age range.

This project was presented for evaluation by the Board of the Coronel Mota Specialty Clinic (CECM) and the Ethics and Research Committee (CEP) of the Universidade Federal de Roraima (UFRR). Noting that the study began after the approval of the research project by the CEP on February 12, 2021, n°: 4.537.631. In addition, the participation of patients, research participants was conditioned to the signing of the Free and Informed Consent Term, Free and Informed Consent Term for Parents or Guardians and the Free and Informed Assent Term. Moreover, they could give up participating and withdraw from the research at any time, without any kind of damage, if they wished.

Data collection

Data collection was performed at the only rheumatology outpatient service in the state of Roraima, located in the capital Boa Vista. In which, the medical records, present in the rheumatology outpatient clinics of the CECM, of patients diagnosed with RA based on the ACR guidelines were analyzed. Those were collected in a specific Google forms spreadsheet, built and validated to minimize differences from register.

The patients were approached in a calm and reserved environment with the aim of ensuring the well-being of the patients and the confidentiality of the information. At this stage, the members of the research team duly introduced themselves, informing, even with badges, their names and belonging institution, in addition to other data that the patients may deem necessary. The selected participants received a detailed explanation about the objectives of the study and were subsequently invited to participate.

Statistical analysis

Data were entered into the Prism - GraphPad 8.0 program, in which they are presented as median (variation) for continuous parameters and numbers (%) for categorical parameters. Data are presented as mean ± SD and range for continuous variables and as percentages for discrete variables. $P < 0.05$ was considered statistically significant.

Results

Out of 150 patients interviewed by the researchers at the CECM rheumatology service and recruited for the study, 138 were women and 12 were men. With greater preponderance in individuals aged 50-59 years (34.7%) and declared brown (82%). Ninety-eight (34.7%) were born outside the state and one-hundred and nineteen (79.3%) lived in the urban area (Table 1).

Regarding the level of education, there was a higher prevalence of participants with complete secondary education (38%), as well as inactivity at work (63.3%). In which the majority has a family income between one and 3 minimum wages (45.4%) (Table 2).

Emphasizing these 150 users, in which 34.7% fully expose the practice of irregular exercise. The majority were non-smokers (56%), non-alcoholics (73.3%) and denying the use of illicit drugs (98.7%) (Table 3).

Table 2 Socioeconomic data referring to patients from Roraima with rheumatoid arthritis (n = 150)

Variables		n (%)	95% Confidence interval
Gender	Feminine	138 (92,0)	86,5 – 95,4
	Male	12 (8,0)	4,6 – 13,5
Age	< 20	1 (0,7)	0,03 – 3,7
	20–29	3 (2,0)	0,5 – 5,7
	30-39	21 (14,0)	9,3 – 20,4
	40-49	29 (19,3)	13,8 – 26,4
	50-59	52 (34,7)	27,5 – 42,6
	60-69	44 (29,3)	22,6 – 37,1
Ethnicity	White	15 (10,0)	6,2 – 15,8
	Black	12 (8,0)	4,6 – 13,5
	Brown	123 (82,0)	75,1 – 87,3

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Table Continued...

Variables		n (%)	95% Confidence interval
Place of birth	Roraima	52 (34,7)	57,4 – 72,5
	Outside Roraima	98 (65,3)	27,5 – 42,6
Zone of residence	Rural	31 (20,7)	14,9 – 27,8
	Urban	119 (79,3)	72,2 – 85,0
	Illiterate	6 (4,0)	1,8 – 8,5
	Complete primary education	13 (8,7)	5,1 – 14,3
	Incomplete Elementary School	34 (22,7)	16,7 – 30,0
Education	Complete high school	57 (38,0)	30,6 – 46,0
	Incomplete high school	5 (3,3)	1,4 – 7,6
	Complete Higher Education	27 (18,0)	12,7 – 24,9
	Incomplete Higher Education	8 (5,3)	2,7 – 10,2
Professional status	Active	55 (33,7)	29,4 – 44,6
	Inactive	95 (63,3)	55,4 – 70,6
	≤ 1 Minimum wage	53 (35,3)	28,1 – 43,3
Family income	≥ 3 Minimum wages	29 (19,3)	13,8 – 26,4
	Between 1 and 3 minimum wages	68 (45,4)	37,6 – 53,3

Table 3 Lifestyle data referring to Roraima patients with rheumatoid arthritis (n = 150)

Variables		n (%)	95% Confidence interval
Practice of physical exercise	Absent (sporadically)	48 (32,0)	25,1 – 39,8
	Irregular (1 to 3 days a week)	52 (34,7)	27,5 – 42,6
	Regular (minimum 30 min for 4 to 7 days a week)	50 (33,3)	26,3 – 41,2
Smoking	Ex-smoker	52 (34,7)	27,5 – 42,6
	smoker	14 (9,3)	5,6 – 15,1
	Non-smoker	84 (56,0)	48,0 – 63,7
Alcoholism	Non-alcoholic	110 (73,3)	65,7 – 79,8
	Alcoholic	40 (26,7)	20,2 – 34,3
Use of illicit drugs	Negative	148 (98,7)	95,3 – 99,8
	Affirmative	2 (1,3)	0,2 – 4,7

Discussion

Noting that there is no study in the state of Roraima, the extreme northern region of the Brazilian territory. The present study investigated demographic data of Brazilian patients with RA diagnosed by criteria established by ACR-EULAR classification criteria for rheumatoid arthritis, published in 2010 in the capital Boa Vista and followed by a rheumatologist.

Through a narrative review carried out in the Scielo, Pubmed and Virtual Health Library databases, only 6 articles were found relating the descriptors: rheumatoid arthritis, epidemiology and Brazil. The state of Roraima has an estimated population of 652,713 people and a demographic density of 2.01 inhabitants/km² according to the Brazilian Institute of Geography and Statistics (IBGE).[13] Thus, the incidence of RA cases in this studied service was 22.9 cases per 100,000 inhabitants/year. Observing the index of the Brazilian study in Cascavel, which presented 13.4/100,000 inhabitants/year, the state of Roraima is within the international indexes of countries in northern Europe and the USA, which vary between 20 to 50 cases per 100,000 inhabitants/year and southern Europe, from 9 to 24 cases per 100,000 inhabitants/year.[14,15]

According to Finckh et al,[4] the estimated prevalence and disease burden of rheumatoid arthritis vary considerably between geographic regions, with generally higher estimates in industrialized countries and urban areas. Here in the state of Roraima, a higher prevalence was found in the urban area (79.3%), unlike the study Almeida et al,[8] in which there was a higher prevalence in the rural area (68.4%).

In older Brazilian studies, in 2006 and 2007, with a number of 1424 participants, 92% were female, 71% were Caucasian and 34% were inactive at work, as well as with 1381 participants, mostly females with 86% and 70% patients were of Caucasian origin, respectively.[9,10] While in the three most recent studies, years 2013 and 2014, Vaz et al.[12] with 19 participants and presenting 15 females. While David et

al.[7] obtained 38 patients, 32 females with a higher prevalence over 40 years. In the meantime, Almeida et al.[8] presented 87 females of the 98 interviewees, with the majority having incomplete primary education[7,8,12]

Highlighting that in the state of Roraima, it was shown that non-smokers were eighty-six participants (56%), while smokers were fourteen (9.3%) and ex-smokers were fifty-two (34.7%). Thus, it is stated that smoking may be related to a genetic trigger with significance in triggering RA. As well, smoking is reported to affect positivity for autoantibody markers of the disease.[16,17] However, Ishikawa Y, Terao C,[16] state that the etiologies and causes of the disease are not yet fully understood (Table 4).

Table 4 Comparison of the incidence of rheumatoid arthritis in Boa Vista, RR, Brazil, with Brazilian data

Author, place of study	Time course	Total RA cases (n)
Current study, Boa Vista - RR	2021	150
Almeida et al, Piauí	2014	98
David et al, Cascavel - PR	2013	38
Vaz et al, Goiânia - GO	2013	19
Mota et al, Brasília	2010	65
Louzada-Junior, São Paulo	2007	1381
Abreu et al, São Paulo	2006	1424

RA, rheumatoid arthritis; R, roraima; PR, paraná; GO, goiás

RA is a diverse disease as it presents itself in different demographics as discussed earlier. Taking into account that this research had one hundred and fifty participants and was located in only one center, due to the structure of public health in the state of RR through National health service (SUS).

Conclusion

The sociodemographic assessment of rheumatoid arthritis performed in this study is similarly achieved in some national and

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international studies. Evidently, it is possible to relate advanced age, low income and lack of higher education with the prevalence of RA, since factors such as lack of knowledge, the pressure with which the patient seeks health services, and low income also make it impossible to payment for private health, which offers faster services, since all participants used the SUS and informed during the interviews. Empirically, resident rheumatologists and public servants in the city claim that the number of patients with RA can reach up to twice the number of respondents, so that it becomes evident that there is a need for multicentric studies with large samples of patients over the years.

Acknowledgments

None.

Conflicts of interest

The author declares that there are no conflicts of interest.

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