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RESEARCH

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Epidemiological analysis of patients with psoriatic arthritis in follow-up at the brazilian Unified Health System

Chayanne Natielle Rossetto[1*], Penélope Esther Palominos[2], Natalia Pereira Machado[1], Eduardo dos Santos Paiva[3] and Valderílio Feijó Azevedo[3]

Abstract

Introduction/Objectives Psoriatic arthritis (PsA) is a chronic multisystem osteoarticular disease that requires specialized care. Most Brazilians depend on the public healthcare provided by the Unified Health System (Sistema Único de Saúde, SUS). This study aimed to describe the epidemiological characteristics of patients with PsA in follow-up in SUS, focusing on the incidence and prevalence of the disease, comorbidities, and hospitalizations.

Methods We collected data from the Outpatient Data System of SUS (Sistema de Informações Ambulatoriais do SUS, SIA/SUS) regarding outpatient visits and hospitalizations in the Brazilian public healthcare system from January 2008 to March 2021 using the Techtrials Disease Explorer® platform and the medical code related to PsA were selected.

Results We evaluated 40,009 patients and found a prevalence of 24.4 cases of visits due to PsA per 100,000 patients in follow-up in SUS. Female patients were predominant (54.38%). The incidence of visits due to PsA has been increasing in recent years and we observed an incidence of 8,982 new visits in 2020. The main comorbidities of these patients were osteoarthritis, lower back pain, shoulder injuries, oncological diseases, crystal arthropathies, and osteoporosis. Hospitalizations were mainly due to treating clinical or cardiovascular conditions and performing orthopedic procedures.

Conclusion The number of visits due to PsA in SUS has increased in recent years, mainly on account of new diagnoses of the disease, although the prevalence found in this study's population was lower than that observed in the general population.

Keywords Psoriatic arthritis, Prevalence, Incidence, Epidemiology, Comorbidities.

*Correspondence:
Chayanne Natielle Rossetto
chay.rossetto@gmail.com
[1]Empresa Brasileira de Serviços Hospitalares – EBSERH - Hospital de Clínicas of the Federal University of Paraná (UFPR), Curitiba, Paraná, Brasil
[2]Hospital de Clínicas of Porto Alegre, Porto Alegre, Rio Grande do Sul, Brasil
[3]Federal University of Paraná (UFPR), Curitiba, Paraná, Brasil

Introduction

Psoriatic arthritis (PsA) is a chronic and multisystem osteoarticular disease that affects 0.1 to 1% of the world's population and 6 to 41% of individuals diagnosed with psoriasis [1, 2]. This disease can occur in any age group. However, the peak incidence occurs in the fifth decade of life and seems to affect men and women equally [1], with some publications showing a predominance in men [3]. In contrast, others offer a slight predominance of women [4].

PsA can lead to musculoskeletal dysfunctions, physical disability, and many comorbidities, including cardiovascular conditions [1]. Its incidence is notably lower in Latin America [5] than in North America and Europe, although it has increased in recent years [6].

The proportion of patients with PsA in a Brazilian cohort assessing spondyloarthritis was 13.7% [7], which can be considered low when compared to other Latin countries, such as Argentina (60.2%) [8].

The diagnosis and the epidemiological description of this disease are important for creating health policies, especially in Brazil since it has a public healthcare system called Unified Health System (Sistema Único de Saúde, SUS) [9]. SUS provides free-of-charge healthcare, with universal coverage encompassing all the national territory, and is the sole healthcare provider for about 70% of the Brazilian population [10]. Up to this date, there are no studies describing the epidemiological characteristics of PsA in the Brazilian population through the assessment of data from SUS only, nor evaluating data from all the country.

Therefore, our study aimed to describe the epidemiological characteristics of patients with PsA in follow-up in SUS, focusing on the incidence and the prevalence of the disease, of comorbidities, and hospitalizations.

Methods:

Data from the Outpatient Data System of the Unified Health System (Sistema de Informações Ambulatoriais do SUS, SIA/SUS) database pertaining to visits and hospitalizations underwent analysis using the Techtrials Disease Explorer® platform (https://ttrials.com/en/). This platform serves as a Business Intelligence (BI) & Real-Word Evidence (RWE) Analytics platform with a vast database of 10 TB and billions of registries, featuring a unique proprietary algorithm. It encompasses data from over 195 million unique (anonymized) patients, constituting 100% of the available structured Public and Private Health data in Brazil. The platform integrates publicly available information provided by the federal government, which is then meticulously collected, identified, encoded, and anonymized. This process enables automatic review and identification of missing or duplicate information within the federal system, significantly minimizing data collection errors. It is noteworthy that this system has been previously utilized in other studies [11]. Data were retrospectively collected in May 2021, corresponding to the period from January 1st, 2008, to March 31st, 2021. We chose 2008 because that was when the SIA/SUS was widely implemented on the federal level.

We selected patients with the following epidemiological codes (Tenth Revision of the International Statistical Classification of Diseases and Related Health Problems, ICD-10) corresponding to psoriatic arthritis: ICD-10 M07.0 (distal interphalangeal psoriatic arthropathy), ICD-10 M07.1 (arthritis mutilans), ICD-10 M07.2 (psoriatic spondylitis) and ICD-10 M07.3 (other psoriatic arthropathies). These codes were chosen by the authors, who are well-experienced in the field of PsA because they are the most prevalent and representative of this disease. We did not restrict the search to any particular age group, although the chosen codes are more commonly associated with conditions that start after 16.

The prevalence of visits due to PsA concerning all the visits in SUS was calculated by dividing the number of individuals who underwent at least one outpatient appointment (outpatient dispensation of medication or medical visit) under the chosen codes (numerator) by the total number of patients in follow-up in SUS during the study period (denominator). In addition to the national prevalence of visits, we also analyzed the prevalence in the 27 federative units and the prevalence by age and sex.

The incidence was described in the total number and number of cases per 100,000 consultations. It was calculated by dividing the number of new visits of patients diagnosed with PsA (numerator) by the number of new visits in SUS in the same period (denominator).

The number of hospitalizations in patients diagnosed with PsA was calculated by crossing data from patients with PsA with data from Hospital Admission Authorizations (Autorização de Internação Hospitalar, AIH); the analyses of causes of hospitalization were conducted according to sex.

The ratio of comorbidities in the outpatient setting was calculated by dividing the number of codes of each comorbidity (numerator) by the total number of patients with PsA codes who underwent visits during the study period (denominator).

All graphics and images were created in the Techtrials Disease Explorer® using Microsoft Power BI®.

Results

We assessed data from 40,009 patients, and most of them were female (54.38%). The mean age was 51.79 years at the data collection date (Chart 1).

The prevalence of visits due to PsA in Brazil was 24.4 cases per 100,000 patients in follow-up in SUS. Higher prevalences were found in the federative units of Santa Catarina (37.9), São Paulo (34.9), and Mato Grosso (32.0),

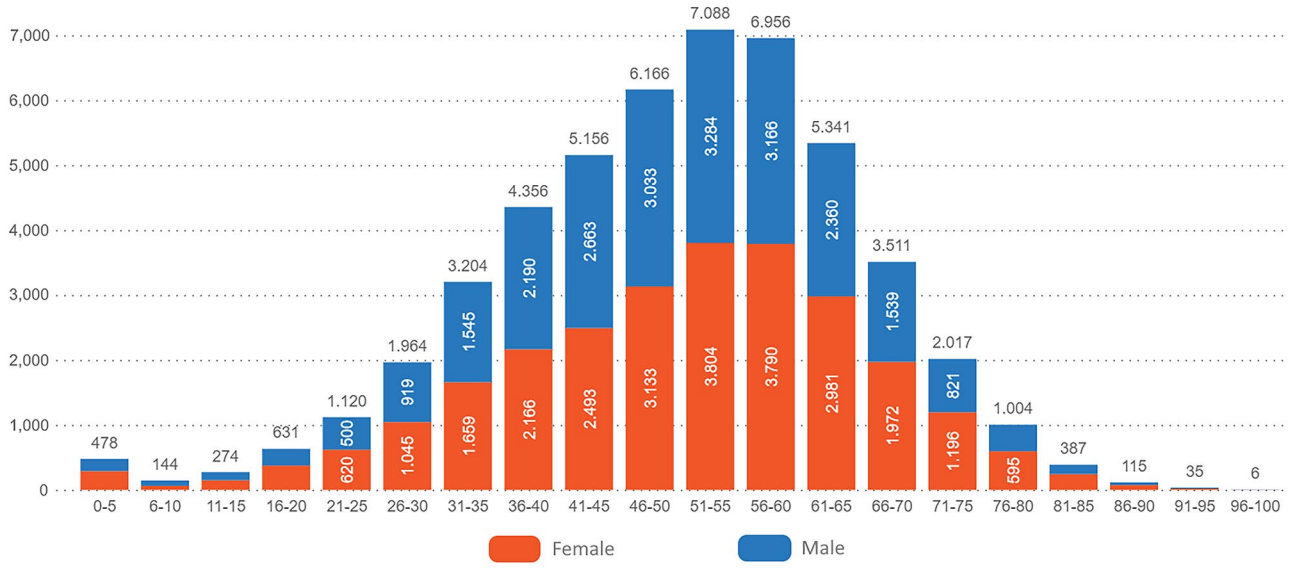

Chart 1 Distribution of patients with psoriatic arthritis in follow-up in SUS from January 2008 to March 2021, in absolute numbers by age and gender

while lower prevalences were found in the federative units of Sergipe (5.32), Bahia (6.43) and Alagoas (8.42). The prevalence of PsA by federative unit in Brazil is shown in Fig. 1.

The incidence of visits due to PsA has increased in recent years, reaching 8,982 new cases in 2020. The cumulative incidence is shown in Chart 2.

Of all the patients, 6,698 (19%) presented at least one comorbidity at the medical consultation, and the most common were osteoarthritis, corresponding to 2,678 (39%) patients, lower back pain corresponding to 2,282 (34%), shoulder injuries corresponding to 1,108 (16.5%), oncological diseases corresponding to 931 (13.89%), crystal arthropathies corresponding to 806 (12%), osteoporosis corresponding to 718 (10.7%), hepatitis C corresponding to 385 (5.7%), carpal tunnel syndrome corresponding to 316 (4.7%), systemic arterial hypertension corresponding to 296 (4.4%), psychiatric illnesses corresponding to 283 (4.2%) and asthma corresponding to 270 (4%) patients.

There were 5,775 hospitalizations of patients with PsA in the study period. The more common reasons were: 2,759 (47.7%) due to clinical emergencies, such as infections, 622 (10.7%) due to cardiovascular diseases, including heart attack and stroke, 535 (9.2%) due to orthopedic surgeries that did not include spine procedures and 219 (3.7%) patients were hospitalized due to arthritis (Chart 3).

Discussion

This is the first Brazilian study using data only from SUS to delineate the population's epidemiological characteristics in follow-up at the public health system care for PsA. We observed in this study an increase in both the prevalence and the incidence of visits that presented the PsA code of the ICD-10 in the last 14 years, showing a great variability between regions, an increased prevalence in women, and a large number of associated comorbidities.

A meta-analysis published in 2018 [6] showed a global prevalence of PsA of 133 per 100,000 people or 0.13% of the global population. In this study, we found a much lower prevalence in Brazil compared to the rest of the world. Although only patients who consulted for PsA in SUS were included, this is likely not the main reason for the difference found since several factors may account for this lower prevalence, such as genetic differences between populations, given that Brazil has a predominantly non-Caucasian population. Moreover, global differences in the PsA prevalence have already been demonstrated, with a higher prevalence in Caucasians [12, 13] and a lower prevalence in Asians [14, 15] and in Indigenous peoples of the Americas [16]. The Brazilian national prevalence in our study was close to that in Argentina [8] in 2011.

Previous studies on the national prevalence of PsA analyzed outpatient data, especially among patients in follow-up for psoriasis at outpatient clinics for the treatment of spondyloarthritis [17–19], and there was no study regarding the epidemiological characteristics of PsA analyzing data from the entire national territory.

Another factor that may have contributed to the lower prevalence was diagnostic error, which is common in PsA

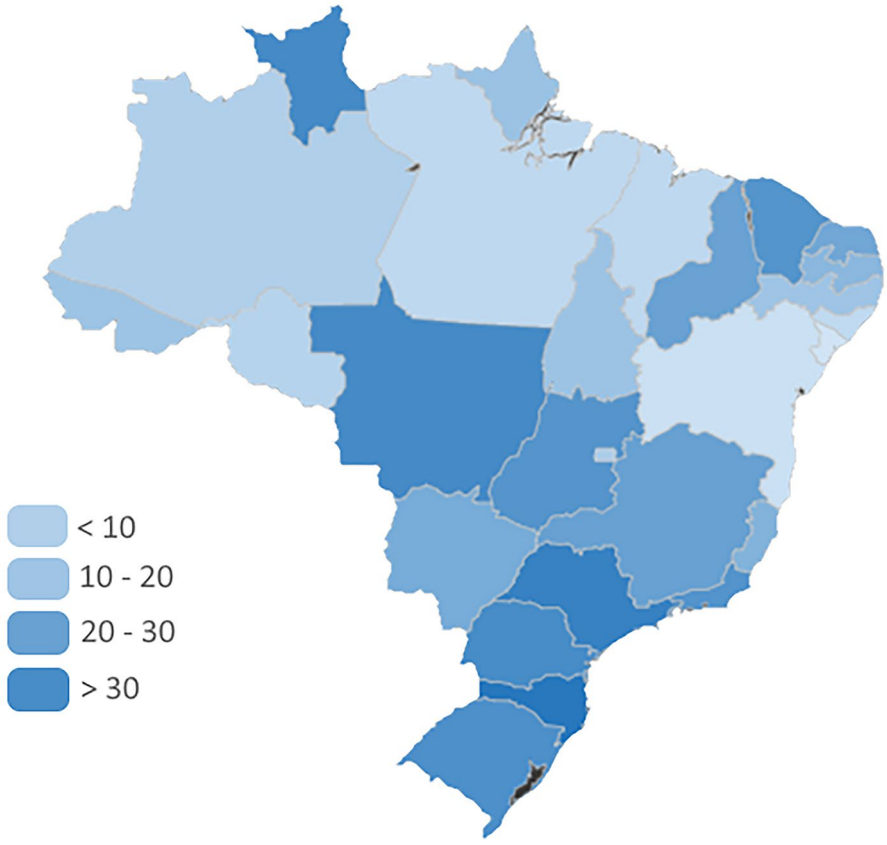

Fig. 1 Prevalence of visits due to PsA in the federative units of Brazil. Rate expressed per 100,000 people

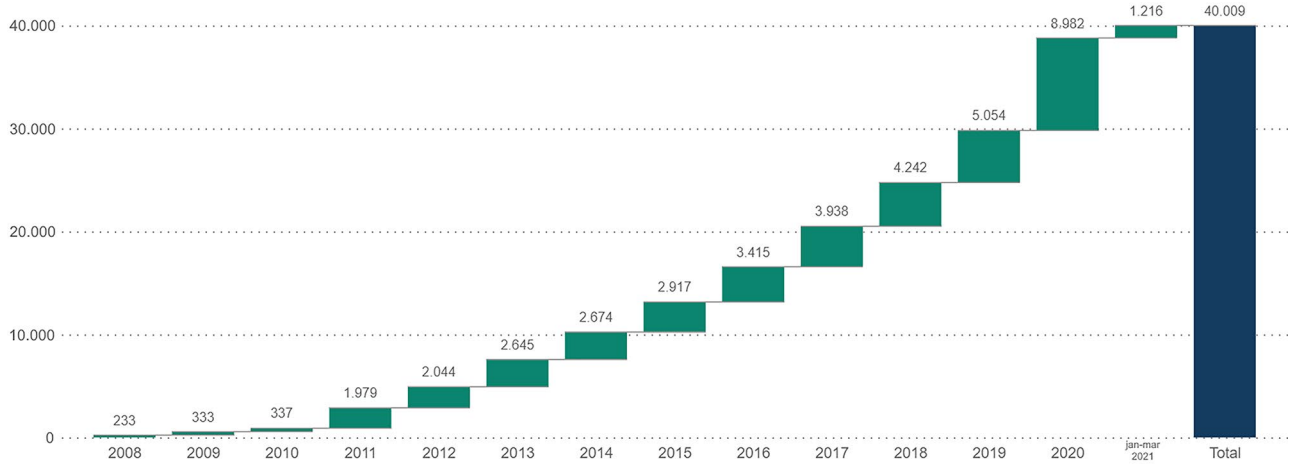

Chart 2 Cumulative incidence of visits due to PsA between January 2008 and March 2021

patients [2]. A meta-analysis published in 2015 [20] demonstrated that diagnostic error in this disease is due not only to confusion with other arthropathies (gout, rheumatoid arthritis, ankylosing spondylitis) but also to the absence of a gold standard test.

The difficult access to health services and specialized care in Brazil, as in other developing countries [21], is certainly the greatest limitation for the diagnosis of PsA, contributing to the difference found between regions. The South and the Southeast regions of Brazil have more

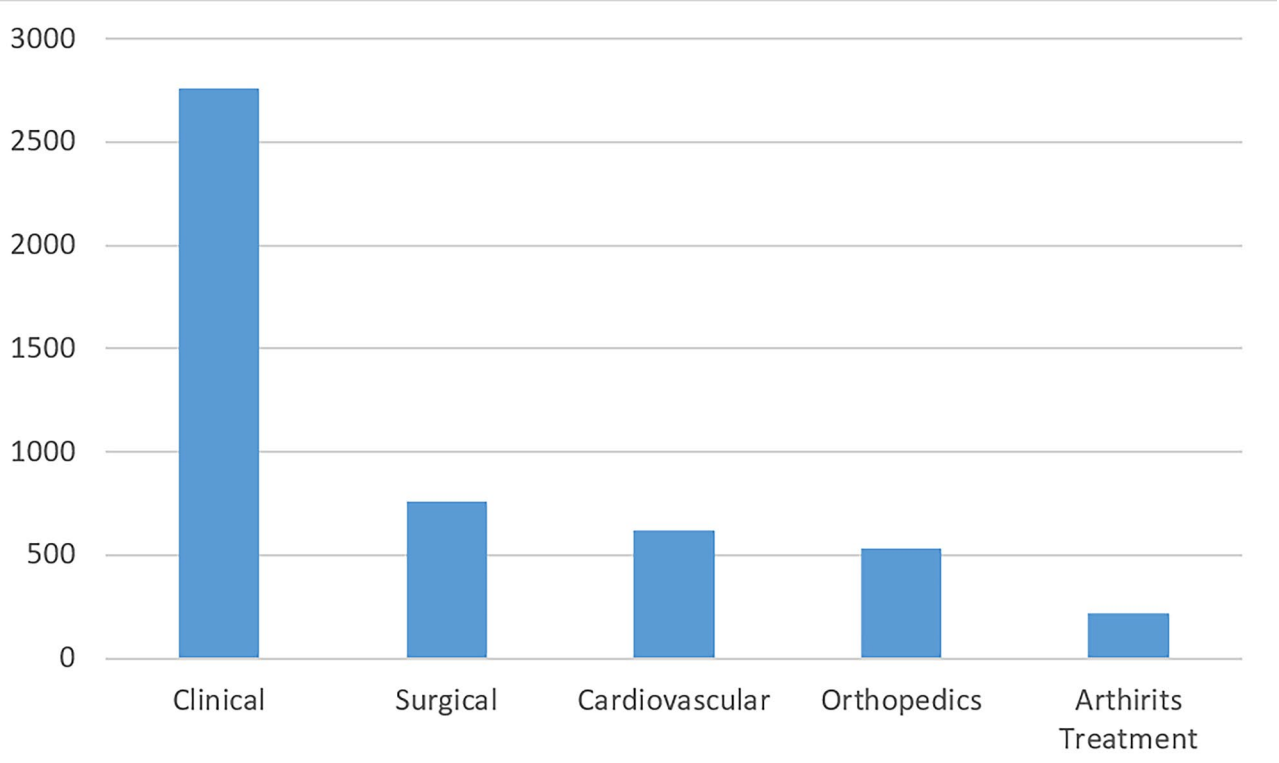

Chart 3 Causes of hospitalizations in patients with PsA grouped by code

physicians per person, more health services, more specialists, and higher Human Development Indexes [22], which may explain the greater offer of healthcare services as well as the greater demand for these services, consequently favoring early and accurate diagnoses.

A higher proportion of patients with PsA was found in the states of the South, Southeast, and Midwest regions (Fig. 1). This finding is consistent with a recent study on the prevalence of Human Leukocyte Antigen-B27 (HLA-B27) in the Brazilian population, which also identified a higher incidence in the South and Midwest regions [23]. This north-south gradient appears to be related to the genetic characteristics resulting from the process of colonization and miscegenation in the country, with a higher concentration of descendants of Caucasians in the southern regions.

There are no major studies on the incidence of PsA in the global population. The aforementioned meta-analysis [6] shows 8.26 new cases per 100,000 people/year. The incidence has been showing an increasing trend, as has the prevalence [15, 24, 25]. In our study, we found a significant increase in incidence in the years 2019 and 2020. We believe this finding is due not only to an increase in cases but also to an increase in diagnoses. In recent years, the global population has seen an increase in diseases that contribute to the development of PsA, such as obesity and metabolic syndrome. In addition, the greater dissemination of scientific knowledge, more accurate clinical criteria, such as CASPAR classification criteria [26], popularization of diagnostic methods, such as imaging tests, and the improvement of data collection methods, with the wide introduction of digital medical records, may have contributed to our finding.

As our data reflect the population's access to SUS, it is possible that better access to this system in recent years has also contributed to an increase in diagnoses.

The slightly higher prevalence of the disease in women is similar to that found in Denmark [24] and Taiwan [15] but different from that found in places with geography and population characteristics similar to Brazil, such as Argentina [8] and the United States [25]. We believe that this discrepancy with other American populations is due to the possibility that Brazilian women are more prompt to seek health care than men.

The comorbidities most commonly reported in the literature are obesity, cardiovascular diseases, and hyperuricemia [27], all of which are associated with a higher chance of developing PsA in patients with psoriasis [28–30]. Although cardiovascular diseases are associated with most immune-mediated rheumatic diseases [31], their contribution to the increase in mortality has not been well established in the literature [32–34]. In this study's population, the prevalence of systemic arterial hypertension was lower (4.4%) than that observed in other studies (19–35% of the population) [35–37]. However, the

prevalence of the code for hypertension in our population was close to that in the general population [38].

No comorbidity was often related to PsA in this study [39], such as diabetes, dyslipidemia, or coronary artery disease [40], yet there were hospitalizations for treating coronary artery disease. This may be explained by the fact that, in non-complicated cases of cardiovascular diseases, the treatment is provided by the attending physician in the outpatient setting, not being the main reason for the medical consultation; thus, there is underreporting of comorbidities due to the absence of their code in patients' records.

The most frequent musculoskeletal comorbidities found in our study were osteoarthritis, shoulder injuries, crystal arthropathies, and osteoporosis. We believe this is due to rheumatologists' skills in making these diagnoses during the medical visit. Patients with PsA are twice more likely to develop osteoporosis in comparison to the general population [41, 42], which is consistent with the data found in our study. Other conditions reported as comorbidities, such as lower back pain and shoulder injury, are possibly symptoms and secondary changes due to the disease itself, including both the current disease activity and degenerative lesions caused by the disease. This study did not assess the difference between inflammatory or degenerative conditions.

Studies published in 2008 and 2016 [43, 44] show, respectively, a prevalence of 10% and 12% of malignancy in the studied population with PsA, similar to the 14% rate found in our population.

In addition, we believe that the number of hospitalizations we found does not correspond to the actual rate, especially regarding the main cause of hospitalization. It is likely that there was an error in the use of the codes, with the trivialization of the underlying disease as the cause of hospitalization. However, the percentage of hospitalization for treating clinical and cardiovascular complications is similar to that described above [45].

The main limitation of our study is addressing the code used in the medical consultation for diagnosis, both in outpatient follow-up and in hospitalizations, since it is possible that there are discrepancies between the actual reason for the medical consultation and the reported code. Moreover, this study's data were retrospectively collected and may have been affected by underreported diagnoses. No data regarding mortality in patients with PsA were analyzed.

Despite these limitations, this is the first study using data available in a national system (Outpatient Data System of SUS, SIA/SUS) to analyze PsA care in SUS. More studies, including prospective ones, are needed to evaluate this topic in Brazil since the epidemiology of PsA is extremely important not only for a better understanding of the disease but also for its treatments and the public management of health resources.

Conclusion

We observed that the number of visits for PsA in SUS has been increasing in recent years, mainly due to new diagnoses of this disease. There is a high resource demand for treating this disease, and in view of its diagnosis increase, more studies regarding cost effectiveness, cost minimization, and drug economy are needed.

The number of patients in follow-up for PsA is lower than the global prevalence. This shows that, despite the advances, we still need more attention to this diagnosis.

The large regional differences found to show that public policies are needed in order to improve access to healthcare, diagnosis, and to adequate treatment in some macro-regions, especially in the North and in the Northeast.

Key points

What is already known about this subject?

APS is a rare disease, but its diagnosis has increased recently. In Latin America, its incidence is classically lower than in northern hemisphere countries.

What does this study add?

This is the first Brazilian study using data only from SUS to delineate the population's epidemiological characteristics in follow-up at the public health system care for PsA. This study observed an increase in both the prevalence and the incidence of outpatient consultations that presented the PsA code of the ICD-10 in the last 14 years, showing a great variability between regions, an increased prevalence in women, and many associated comorbidities.

How might this impact on future developments?

The increase in PsA diagnoses in recent years and the large regional differences found show that public policies are needed to improve access to health diagnosis, and adequate treatment in some regions of Brazil.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s42358-023-00327-x.

Supplementary Material 1

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Authors' contributions

The first author collected and evaluated the data and wrote the article. The other authors carried out the data review and scientific review of the article.

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The authors did not receive any financial support for this study. The data from the Brazilian public health system is free, and data analysis was carried out utilizing a techno-scientific partnership with the private company Techtrials.

Data Availability
All data used are freely available on the DATASUS public access platform on the website: https://datasus.saude.gov.br/acesso-a-informacao/producao-ambulatorial-sia-sus/.

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