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ORIGINAL ARTICLE

Prevalence of musculoskeletal disorders and rheumatic diseases in an Argentinean indigenous Wichi community

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Abstract

Objective To estimate the prevalence of musculoskeletal disorders (MSK) and rheumatic diseases in an indigenous Wichi population in Argentina.

Methods This is a cross-sectional, community-based study using the Community-Oriented Program for the Control of Rheumatic Diseases (COPCORD) methodology in ≥ 18-year-old subjects. Validated surveys were conducted by trained interviewers. Subjects with MSK pain (positive cases) were evaluated by internists and rheumatologists for diagnosis and treatment.

Results A total of 648 interviews were performed (90.4% of the census population). Mean age was 37.5 years (SD 14.8), and 379 (58.5%) were female. The mean years of education was 7.0 (SD 3.7); 552 subjects (85.2%) were covered by the public health care system. A total of 216 (33.3%) subjects had MSK pain in the last 7 days. Rheumatic disease prevalence was as follows: mechanical back pain (19.0%), rheumatic regional pain syndrome (5.2%), osteoarthritis (3.2%), rheumatoid arthritis (RA) (3.2%), inflammatory back pain (1.2%), undifferentiated arthritis (0.3%), Sjögren syndrome (0.15%), and fibromyalgia (0.15%). RA patients included 19 (90.5%) women and 9 (42.9%) with RA family history. One hundred percent were seropositive and 66.7% showed radiologic erosions. The mean of Disease Activity Score [DAS-28 (ESR)] at the time of diagnosis was 5.1 (SD 1.5) and the Health Assessment Questionnaire Disability Index (HAQ-DI) was 0.8 (SD 0.4).

Conclusion RA prevalence was 3.2%, one of the highest reported using the COPCORD methodology in indigenous and non-indigenous peoples in Latin America, with a high percentage of family cases. Pain and functional capacity were the variables allowing patients' early referral to a specialist.

Key Points

- *The RA prevalence was 3.2%, one of the highest reported using COPCORD methodology in indigenous and non-indigenous peoples in Latin America.*
- *The patients with RA had high percentage of familiar history of RA.*
- *The pain and functional capacity were the variables associated with a diagnosis of any rheumatic disease and should be considered for early referral.*
- *The mean of the delay in the diagnosis was 5.8 years. In this community, the lack of the "migration health" phenomenon may be a social determinant that negatively impacts their health.*

Keywords COPCORD methodology · Indigenous peoples · Prevalence · Rheumatic diseases · Wichi

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Introduction

Musculoskeletal disorders (MSK) and rheumatic diseases represent a large, heterogeneous group of pathologies associated with disability, quality of life deterioration, and in some cases, with a higher incidence of mortality [1]. The negative impact produced by this group of diseases is even higher in some minority ethnic groups. Indigenous/original patients with a rheumatic pathology, especially with rheumatoid arthritis (RA), present the following characteristics: higher aggressiveness, worse evolution, and a higher impact in their daily lives [2]. This represents a more serious problem in relation to health accessibility and inequity, which is typical in developing countries, especially in the Latin American (LA) region. In relation to this, Loyola-Sánchez et al. [3] point out that indigenous patients do not use specialized health services. In most cases, subjects have contact with these services through a consultancy at an emergency service.

The World Health Organization (WHO) and the International League of Associations for Rheumatology (ILAR) have developed a program called Community Oriented Program for the Control of Rheumatic Diseases (COPCORD) due to the need of having reliable data on the extent and impact of these pathologies in vulnerable populations [4]. One of the objectives of the COPCORD methodology is to have a good performance as a screening test to detect rheumatic diseases in general and RA in particular [5, 6].

In LA, around 10% of the total population belongs to indigenous/original peoples, with approximately 400 different groups. The countries with the highest indigenous/original population are Bolivia, Guatemala, and Peru, followed by Belice, Mexico, and Honduras [7].

The group "Grupo Latino Americano de estudio De Enfermedades Reumáticas en Pueblos Originarios" (GLADERPO) has worked in different LA indigenous/original communities since its creation in 2009 [8–10]. The highest prevalence of RA was estimated to be in the Qom community in the city of Rosario, Argentina [11]. Despite the work performed by GLADERPO, there is still no global picture on rheumatic diseases, partly due to prevalence differences, especially in RA. For this reason, it is necessary to continue documenting the epidemiology of these pathologies as well as the impact that they generate.

In Argentina, as per the last 2010 census, it is estimated that almost 1.000.000 inhabitants self-identified as belonging to indigenous peoples [12]. This community is known either as Wichi or Mataco and they represent 5.3% of the total, reaching a population of 50.419 subjects (https://www.indec.gov.ar/ftp/cuadros/poblacion/censo2010_tomo1.pdf). They belong to the linguistic Mataco-Maca family group [13]. They settled 4.000 to 5.000 years ago in the Gran Chaco ("hunting territory" in Quechua) region, which covers the northern region of Argentina, Bolivia, Paraguay, and Brazil, being an area of demographic, linguistic, and cultural diversity [14].

This study aimed to estimate the prevalence of musculoskeletal disorders and rheumatic diseases in a Wichi population from Misión Chaqueña "El Algarrobal", Salta, Argentina.

Materials and methods

A community-based, analytical, cross-sectional, epidemiological study was performed in the Wichi population from Misión Chaqueña "El Algarrobal", in the province of Salta, Argentina, using the COPCORD methodology.

A population census was conducted since there were no official data on the number of inhabitants in the community.

Study population

Self-identified, ≥ 18-year-old, Wichi subjects, residing in the Misión Chaqueña "El Algarrobal" community for more than 6 months, were included in the study. Misión Chaqueña is geographically located in the district of General San Martin, in the province of Salta, Argentina. It lies 5 km from the left bank of the Bermejo River and 45 km from the town of Embarcación [12]. Its access is geographically difficult.

The Wichi community was selected for this study due to an empirical perception related to a higher frequency of rheumatic pathologies in this population.

Survey

The COPCORD questionnaire, which has been previously transculturally adapted and validated in other indigenous communities by the GLADERPO group [15], served as the data collection tool. The questionnaire was administered by previously trained interviewers together with coordinators, physicians, and community representatives who acted as bilingual translators-facilitators. The COPCORD questionnaire consists of the following four sections: an explanatory section, including sociodemographic data, work history, and self-reported comorbidities; a section to identify musculoskeletal pain in the last 7 days or at any time in the subject's lifetime, including features such as pain intensity, physical limitation, and adaptation; a help-seeking behavior and medical and/or traditional treatment section; and finally, a section to assess functional capacity, measured by the abbreviated and validated tool Health Assessment Questionnaire disability index (HAQ-DI) [5].

In addition, a questionnaire with socioeconomic and sanitary markers was designed, including time of residence, formal education degree, health coverage, and living conditions.

Field work

A pilot survey was carried out in the Carboncito community, located 5 km from the study community (Misión Chaqueña "El Algarrobal"), which aimed to validate and culturally adapt the COPCORD questionnaire.

The survey was performed by means of door-to-door home visits. If the subject was not at home, visits were repeated at different times and days of the week, for at least five times. If the subject was still not found, the subject was considered to be absent. Home visits began with the introduction of the translator-facilitator, who explained the purpose of the study, participant confidentiality, and future use of the data collected. The subject was invited to participate and an informed consent form was provided, with enough time for the subject to read and understand it. If the subject was illiterate, the informed consent procedure was verbally explained. Signing of the informed consent, either written or fingerprinted in the case of illiterate subjects, was done in the presence of a witness, a translator-facilitator, and the interviewer. The duration of the study was 8 months.

After completing the questionnaire and if the result was positive (presence of musculoskeletal pain in the last 7 days or at any time of the subject's lifetime), a first evaluation was carried out by a field internist, trained previously by a certified rheumatologist in the identification of rheumatic diseases. If any examined subject had a clinical evaluation suggesting a rheumatic disease, they were referred to a rheumatologist for diagnosis and treatment at the health care center in the subject's community. The rheumatologist performed the complete clinical examination and diagnostic tests that he considered appropriate to arrive at the diagnosis based on the accepted classification criteria. In the case of polyarthritis of large and small joints, anti-CCP antibodies were performed in all patients and other determinations that, at the rheumatologist's clinical criteria, were of clinical importance as well as x-rays of hands and feet.

In this way, the rheumatologist provided diagnosis as per standard criteria for RA [16], Sjögren syndrome (SS) [17], spondyloarthritis (SpA) [18], osteoarthritis (OA) [19], fibromyalgia (FM) [20], and rheumatic regional pain syndrome (RRPS) [21]. In the case of back pain and probable RRPS, previously validated questionnaires were used [21–23]. Disorders not included in the previous categories were classified as unspecified musculoskeletal (UMSK) disorders, according to the *International Classification of Diseases, 10th Revision (ICD-10)*, published by the WHO [24].

Ethical aspects

Before being implemented, the study was approved by the ethics committee of Hospital Señor del Milagro and by the Ministry of Public Health from the Province of Salta (file no. 0100134-6738/2017-0). It was also endorsed by the Argentinean Rheumatology Society, Rheumatology Society of Salta-Jujuy, and by the Ministry of Indigenous Affairs and Social Development of the Province of Salta.

Statistical analysis

An exploratory analysis of the variables included in the theoretical model, reporting measures of central tendency and dispersion in continuous variables, as well as absolute and relative frequencies in nominal or categorical ordinal variables, was performed. A comparative analysis of variables, with a significance level of 0.05, was performed.

A bivariate analysis was performed for each study variable, using one-way and two-way analysis of variance (ANOVA) for continuous variables and Chi-squared for nominal and categorical ordinal variables. The HAQ-DI score was categorized according to values, with a cutoff of 0.8 [5]. The statistical analysis was performed with the statistical package SPSS (Statistics Standard Edition 22).

Results

Census population included 717 ≥ 18-year-old-subjects, with 648 participating in the study (90.4%). Forty-one (5.7%) subjects were considered absent and 28 (3.9%) did not agree to participate.

The mean age was 37.5 years (SD 14.8; range 18–85**)** and 379 (58.5%) were female. The most frequently reported place of birth was Misión Chaqueña "El Algarrobal" with 539 (83.2%) subjects still living there. In relation to Wichi ancestors, 605 (93.4%) subjects reported both parents to be descendants of the Wichi ethnicity. The mean of education was 7 years (SD 4.8; range 0–18). At the time of the survey, 498 (76.9%) subjects were occupationally active. However, only seven (1.1%) had formal employment. Load work was reported by 401 (61.9%) subjects while repetitive work was reported by 365 (56.3%). As regards health coverage, 552 (85.2%) subjects were users of the public health system (Table 1).

The most frequently self-reported comorbidities were as follows: 137 (21.1%) subjects were smoking, 93 (14.4%) had gastritis, 79 (12.2%) Chagas disease, 76 (11.7%) arterial hypertension, 26 (4.0%) tuberculosis, and 18 (2.8%) diabetes mellitus (Table 1).

In relation to MSK pain, 216/648 (33.3%) subjects had pain in the last week, and out of the 216, 162 (75.0%) had pain not related to an injury. Pain at any time in the subject's lifetime (historical pain) was reported by 273/648 (42.1%) subjects. Pain in the last 7 days together with historical pain (both) were present in 314/648 (48.5%) subjects.

Within the subgroup of subjects with pain in the last 7 days, 61/216 (28.2%) had severe pain and 121/216 (56.0%)

reported lack of adaptation to the pain. Of the total number of subjects interviewed, 35/596 (5.9%) described difficulties performing daily work and 34/596 (5.7%) subjects presented an HAQ-DI ≥ 0.8.

The most frequent MSK pain sites in the last 7 days are shown in Fig. 1, and the most representative sites, by order of frequency, were as follows: lumbar spine in 80 subjects (12.3%; 95%CI 9.8–14.8), knees in 53 (8.2%; 95%CI 6.0–10.2), and hands in 47 (7.3%; 95%CI 5.2–9.2) subjects.

Out of the total of subjects who presented pain, 160/314 (51.0%) reported no request for help, 120/314 (38.2%) were attended to the health care center, and 16/314 (5.1%) visited their traditional physician or "shaman."

In relation to treatments, 137/314 (43.6%) subjects had received some type of treatment, 109/137 (79.6%) received non-steroidal anti-inflammatory drugs (NSAIDs), 11/137 (8.0%) analgesics, and 9/137 (6.6%) disease-modifying anti-rheumatic drugs (DMARDs).

Table 1 Sociodemographic characteristics of the Wichi community

Variables	$N = 648$
Female, *n* (%)	379 (58. 5)
Age, years, mean (SD; range)	37.5 (14.8; 18–85)
Place of birth, *n* (%)[a(61)]	
Living in the place of birth	539 (83.2)
Others	48 (7.4)
Language, *n* (%)	
Spanish	617 (95.2)
Wichi	625 (96.5)
Wichi Ancestor, *n* (%)	
Mother	635 (98.0)
Father	609 (94.0)
Mother and father	605 (93.4)
Years of education, *n* (%)[a(214)]	
Illiterate	44 (6.8)
1 − 6.9	328 (50.6)
> 7–12	62 (9.6)
Years of education, mean (SD; range)	7 (4.8; 0–18)
Current work, *n* (%)	
Load (≥ 4 kg)	401 (61.9)
Repetition	365 (56.3)
Health coverage, *n* (%)[a(73)]	
Public	552 (85.2)
Private	23 (3.5)
Comorbidities, *n* (%)	
Smoking	137 (21.1)
Gastritis	93 (14.4)
Chagas disease	79 (12.2)
Arterial hypertension	76 (11.7)
Tuberculosis	26 (4.0)
Diabetes mellitus	18 (2.8)

SD (standard deviation); [a] (missing data)

The prevalence of rheumatic diseases by frequency in decreasing order was as follows: 123 (19.0%; 95% CI 16.0–22.2) patients had mechanical back pain, 86 (13.3%; 95% CI 10.7–16.1) UMSK, 34 (5.2%; 95% CI 3.7–7.2) RRPS, 21 (3.2%; 95% CI 2.0–4.9) OA, 21 (3.2%; 95% CI 2.0–4.9) RA, 8 (1.2%; 95% CI 0.5–2.4) inflammatory back pain, 2 (0.3%; 95% CI 0.03–1.1) undifferentiated arthritis (UA), 1 (0.15%; 95% CI 0.004–0.8) SS, and 1 (0.15%; 95% CI 0.004–0.8) had FM. A total of nine subjects had other diagnoses that did not meet any of the above-mentioned categories.

As shown in Table 2, pain distribution in the last 7 days was more prevalent in middle age and female gender. The mechanical back pain as well as OA and RRPS were more prevalent in male and in stages of increased labor production.

A comparison was made between groups of subjects with (1) inflammatory arthritis (RA, UA), (2) RRPS, (3) UMSK, (4) specific disease that is not RA or UA (OA, FM, SS), (5) non-inflammatory axial disease, and (6) negative survey controls. The statistically significant variables observed were age ($p = 0.001$), pain in the last 7 days ($p = 0.001$), treatment during last week ($p = 0.001$), and HAQ-DI ≥ 0.8 ($p = 0.001$) (Table 3).

Out of the total number of patients with RA, 14 (66.7%) subjects were diagnosed during the study and 7 (33.3%) had been previously diagnosed and were under treatment and medical follow-up. A total of 19 (90.5%) were female and 9 (42.9%) had RA family history. Mean age was 43.0 (SD 7.1; range 32–61) years. The mean time between symptom onset to diagnose was 5.8 years (SD 7.2; range 0–13). A total of 16 (76.2%) patients presented positive rheumatoid factor (RF), 21 (100%) were positive for the anti-cyclic citrullinated peptide (anti-CCP) antibody, and 14 (66.7%) showed radiologic bone erosions in their hands and feet. The patients had a mean DAS 28-erythrocyte sedimentation rate (ESR) of 5.1 (SD 1.5; 95% CI 4.4–5.7) and a mean HAQ-DI of 0.8 (SD 0.4; range 0–1.7). A total of eight patients were receiving DMARDs (seven methotrexate and one hydroxychloroquine), 10 (47.6%) NSAIDs, and 6 (28.6%) glucocorticoids (Table 4).

Discussion

It should be noted that this is the second work performed by GLADERPO in indigenous communities in Argentina. One of the most relevant findings in this study was the high prevalence of RA (3.2%), which was even higher than the prevalence reported for the Qom community in the city of Rosario (2.4%) [25]. Out of the reported cases, 67% were incident cases, diagnosed by means of this field study.

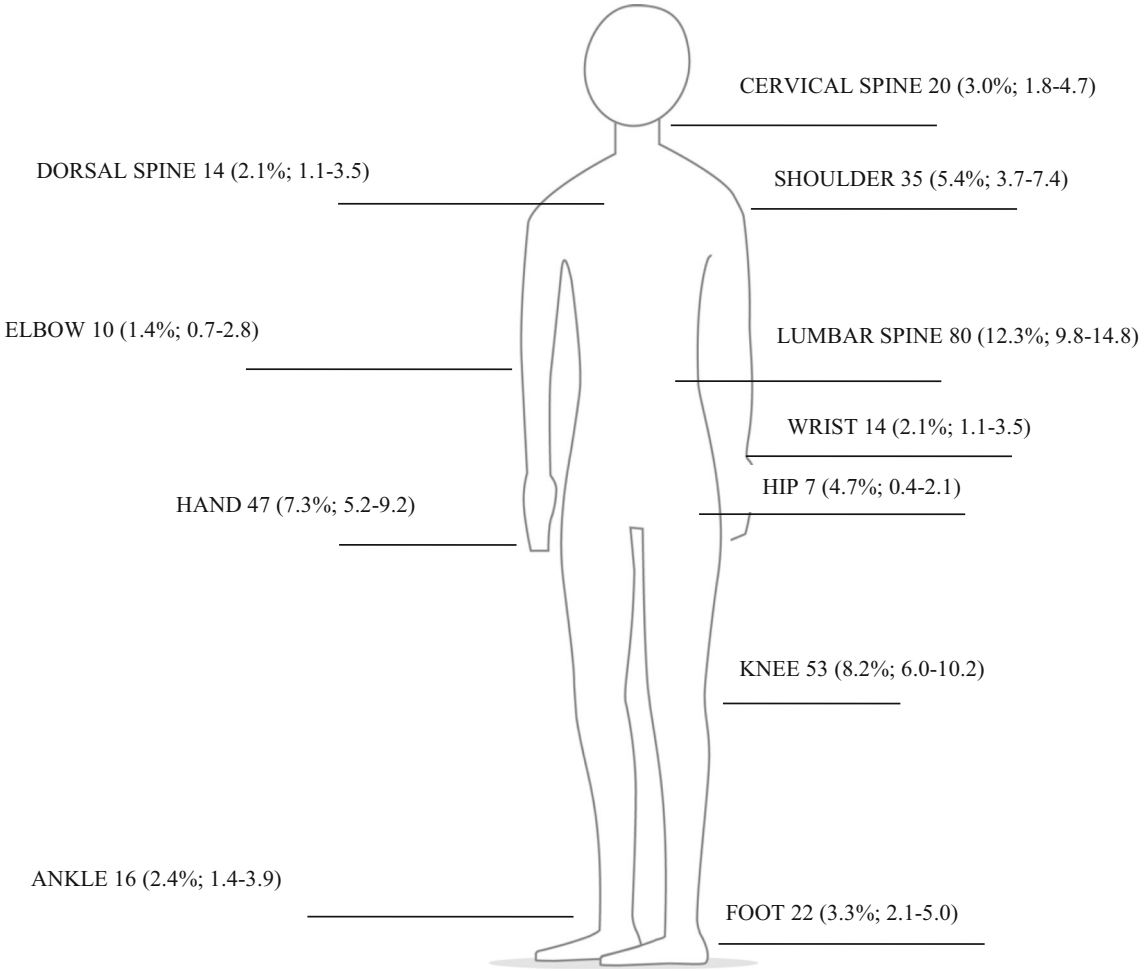

Fig. 1 Sites of musculoskeletal pain in the last 7 days

As mentioned before, RA prevalence in the Wichi community is the highest reported by our group, using the same methodology [9, 26]. Similarly, higher prevalence has been reported in some native peoples from North America, reaching up to 5–7%, with Chippewa (6.8–7.1%), Pima (5.3%), Yakima (3.4% in women), and Tingit (2.4%) being the most representative communities [27].

As in the Qom study [25], patients showed a high percentage on seropositive RF and anti-CCP, and a delay in the diagnosis, with a mean of 5.8 years. In addition, they showed a high disease activity, measured by DAS 28 (ESR), and a high percentage on radiologic erosions. Similarly, to the different North American indigenous communities [27], presentation of the disease is more aggressive and seropositive, with a higher percentage of erosions, higher frequency of the disease

Table 2 Distribution of musculoskeletal pain in the last 7 days and more prevalent rheumatic diseases by age and gender

		Musculoskeletal pain in the last 7 days *n* (%; 95% CI)	Mechanical back pain *n* (%; 95% CI)	OA *n* (%; 95% CI)	RA *n* (%; 95% CI)	RRPS *n* (%;95% CI)
Gender	Female	132 (34.8; 30–40)	65 (17.2; 13–20)	65 (17.2; 13–20	16 (4.2; 2–6)*	19 (5; 2–7)
	Male	83 (30.9; 25–36)	58 (21.6; 16–25)	58 (21.6; 16–26)	5 (1.9; 1–30)*	15 (5.6; 2–8)
Age by group	Young (< = 45)	147 (31.5; 27–43)	87 (18.6; 15–22)	87 (18.6; 15–22)	5 (1.1; 1–20)**	21 (4.5; 2–6)
	Middle (46–64)	58 (38.9; 13–26)	30 (20.1; 13–26)	30 (20.1; 13–26)	12 (8.1; 3–12)**	10 (6.7; 2–10)
	Elderly (> = 65)	9 (31; 13–49)	6 (20.7; 5–36)	6 (20.7; 5–36)	4 (13.8; 4–27)**	3 (10.3; − 1–22)

OA (osteoarthritis); RA (rheumatoid arthritis); RRPS (rheumatic regional pain syndrome); 95% CI (confidence interval of 95%)

*$p = 0.09$

**$p < 0.001$

Table 3 Comparison of variables between different diagnostic groups

Variables	Controls $n = 327$	Arthritis (RA + UA) $n = 23$	RRPS $n = 34$	UMSK $n = 86$	Non-RA/UA specific disease $n = 23$	Non-inflammatory axial disease $n = 146$	p
Age, mean (SD)	35.8 (14.7)	43.6 (8.9)	40.9 (15.9)	34.5 (13.0)	54.9 (13.8)	38.6 (14.6)	0.001
HAQ, mean (SD)	0.009 (0.05)	0.76 (0.5)	0.18 (0.4)	0.26 (0.4)	0.4 (0.4)	0.16 (0.30)	0.001
Current work, *n* (%)	250 (76.5)	16 (69.6)	25 (73.5)	69 (80.2)	16 (69.6)	116 (79.5)	0.700
Load ≥ 4 kg, *n* (%)	194 (59.3)	12 (52.2)	20 (58.8)	56 (65.1)	13 (56.5)	99 (67.8)	0.650
Repetition, *n* (%)	178 (54.4)	12 (52.2)	21 (61.8)	56 (65.1)	10 (43.5)	83 (56.8)	0.360
Pain in the last 7 days, *n* (%)	0 (0)	21 (91.3)	29 (85.3)	56 (65.1)	16 (69.6)	93 (63.7)	0.001
Treatment, *n* (%)	0 (0)	15 (65.2)	10 (29.4)	29 (33.7)	7 (30.4)	49 (33.5)	0.001
HAQ-DI ≥ 0.8, *n* (%)	0 (0)	12 (52.2)	3 (8.8)	11 (12.8)	3 (13.0)	5 (3.4)	0.001

SD (standard deviation); HAQ-DI (health assessment questionnaire-disability index); RA (rheumatoid arthritis), UA (undifferentiated arthritis); RRPS (rheumatic regional pain syndrome); UMSK (unspecified musculoskeletal disorders): myalgia, paresthesia, cramps, arthralgia

in family history and onset at an early age. Clinical and serological characteristics shared by the studied indigenous communities may be partially justified by a strong genetic contribution to the development of RA. In both communities (Qom and Wichi) it is hypothesized that the result of genetics, environmental, and sociocultural factors plays a fundamental role in the occurrence of RA as an aggressive disease. Future research is needed.

As mentioned before, the delay in diagnosis is a point to be noted. Several studies ran in LA countries show a diagnosis delay that ranges from a minimum of 1 year in Argentina to a maximum of almost 6 years in Venezuela [28–31]. In all cases, associated variables were low socioeconomic level, low educational level, rural residence, and belonging to a minority ethnic group. In both communities, the "migration heath" phenomenon (health care search) may be a social determinant of their health [32]. In Wichi community, the lack of this phenomenon may be a negative impact on their health. In opposition, the Qom population had a migration pattern of moving from their hometown to urban areas, which may also negatively affect their health through residential instability, stress, and loss of social and support networks. Despite this, both indigenous populations have striking delays in diagnosis.

Table 4 General characteristics of Wichi community patients diagnosed with rheumatoid arthritis

Variables	$n = 21$
Female, *n* (%)	19 (90.4)
Age, years, mean (SD; range)	43.0 (7.1; 32–61)
Previous diagnosis, *n* (%)	7 (33.3)
Age, years at time of diagnosis, mean (SD; range)	36.9 (8.1; 24.6–51.0)
Delay in diagnosis*, years, mean (SD; range)	5.8 (7.2; 0–13)
RA family history, *n* (%)	9 (42.8)
Positive RF, *n* (%)	16 (76.1)
Positive anti-CCP, *n* (%)	21 (100)
Erosions, *n* (%)	14 (66.6)
DAS 28 ESR, mean (SD; 95%CI)	5.1 (1.5; 4.4–5.7)
HAQ, mean (SD; range)	0.8 (0.4; 0–1.7)
Treatment with NSAIDs, *n* (%)	10 (47.6)
Treatment with DMARDs, *n* (%)	8 (38.1)
Treatment with glucocorticoids, *n* (%)	6 (28.6)

SD (standard deviation); 95% CI (Confidence Interval of 95%); *time from symptom onset to RA diagnosis; RF (rheumatoid factor); anti-CCP (anti-cyclic citrullinated peptide antibody); DAS 28 ESR (Disease Activity Score); HAQ (Health Assessment Questionnaire); NSAIDs (non-steroidal anti-inflammatory drugs); DMARDs (disease-modifying anti-rheumatic drugs)

Other relevant findings in the study were high prevalence of MSK pain (314 subjects; 48.5%) and pain in the last week (216 subjects; 33.3%) associated with a significant functional capacity measured by HAQ-DI. These findings have lower percentages than those in the study carried out in the Qom community in Rosario, 53.7% and 52.9%, respectively [25]. In the COPCORD studies performed in indigenous peoples in Guatemala and Australia, the prevalence of musculoskeletal pain was lower, 4.5% and 33%, respectively [33, 34]. The difference found between different communities may be related to the kind of work they perform, which requires high physical demand and, especially, load and repetitive work.

Mechanical back pain was the disease with the highest prevalence in this study, identified in 123 (19.0%) subjects. In comparison with other studies, using COPCORD methodology, the prevalence was similar to the one in the Qom community in Argentina (20.1%) [25] and communities in Australia (14.0%) [34], and higher than the prevalence reported in Guatemala (5.0%) [33], Mexico (8.0%) [23], and Ecuador (9.3%) [9]. These differences may be related to the work performed in each community. As previously mentioned, forced labor was present in almost 70% of the subjects in our study, with a diagnosis of mechanical back pain. Only

1.2% of the evaluated subjects showed features of inflammatory back pain.

In our study, RRPS prevalence was 5.2%, with a higher frequency in rotator cuff tendinopathy, with similar data to those in other communities studied by GLADERPO [21].

OA prevalence was 3.2% in comparison with other studies performed by COPCORD in Guatemala (3.9%) [33] and in the Qom community in Rosario (4.0%) [11]. The low OA prevalence identified in the Wichi population may be related to a lower mean age (37.5 years, SD 14.8).

Comparing the Wichi community with other indigenous communities where the COPCORD methodology has been carried out, we observed that the overall prevalence of pain was higher in female as it was observed in Guatemala [33], but in opposition to the Qom [11] and Ecuador communities [9], the prevalence of mechanical back pain as well as RRPS was more prevalent in male. This difference in the distribution by gender could be due to either the difference in the work assigned in each community or to the different perceptions of pain by female in the Wichi community, or by both factors.

In relation to other autoimmune diseases, two UA and one SS were identified; no other cases of inflammatory rheumatic or systemic autoimmune diseases were diagnosed.

A low prevalence of FM (0.15%) was identified, which was similar to the one reported in the Qom community (0.06%) [11], in comparison with other communities studied by GLADERPO, where the FM prevalence was higher as in the Maya-Yucateco (2.2%) community [35] and in Ecuador (2.0%) [9]. We believe that these differences may be partially related to the personal and social stress that these communities experience. In relation to the absence of gout, as described in the Qom community [11] and similar to what was reported in Guatemala (one case reported) [33], this fact may be related to the eating habits of the community. In contrast, in the Australian indigenous communities, the prevalence of this disease was 9.7% in men and 2.9% in women [34].

The variables strongly associated with a diagnosis of any rheumatic disease were pain in the last 7 days and functional impairment measured by HAQ-DI. These findings have been similar in other studies performed by GLADERPO [11, 26, 35–37]. General physicians should take all these data into account in order to rule out a rheumatic pathology and give patients an early and immediate referral to a rheumatologist, prioritizing the appropriate therapeutic opportunity window.

Another point to highlight is that despite the differences found between the two communities studied by GLADERPO in Argentina, the reality is similar regarding the delay in reaching a diagnosis, which shows health inequity [38]. Social determinants condition this inequity as do the combination of other comorbidities and the genetic and cultural aspects [39]. From a different point of view, Colmenares Roa and Peláez Ballestas [40] investigated how health professionals identified indigenous patients within a hospital setting, noting that the socially constructed indigenous identification promotes the naturalization of the inequity. Therefore, it is necessary to insist on another type of multidimensional approach for the management of these pathologies in indigenous/original people [10].

The main limitations of this study were the small size of the study population and the scattered distribution of houses; however, the strength was the fact that it was based on a community census. Another strength was the fact that it was the first study carried out in an indigenous/original community in their original ancestral place.

In conclusion, this study shows a high prevalence of MSK disorders and rheumatic diseases in the Wichi population, especially in mechanical back pain and RA.

The use of COPCORD methodology to detect MSK disorders and rheumatic diseases in an easy and rapid fashion must be highlighted. It is important to note that clinical data provided by the patients on pain characteristics and functional limitations should be the most relevant aspects for general physician to take into account for quick referral to a specialist when MSK disorders and rheumatic diseases are suspected.

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