

Post-chikungunya chronic inflammatory rheumatism: Follow-up of cases after 1 year of infection in Tolima, Colombia[☆]

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ABSTRACT

Introduction: Chronic Inflammatory Rheumatism (CIR) is one of the recognized and increasingly reported consequence post-chikungunya infection (pCHIK) in Colombia and Latin America.

Methods: Retrospective cohort study of 128 patients with CHIK that persisted with pCHIK-CIR after 59–68 weeks (1.13–1.31 years). This information was evaluated by means of a telephone survey and according to validated criteria (WHO 2015) previously (patients with > 12 weeks post-CHIK with ≥ 1 manifestations [continuous/recurrent]: chronic polyarthralgia [pCHIK-CPA], stiffness and/or joint edema).

Results: Of the total CHIK-infected subjects finally included (n = 65), 28 (43.1%) reported pCHIK-CPA; and 38 patients (58.5%) at least one persistent rheumatological symptoms over the last year (pCHIK-CIR); 38.5% of them, morning stiffness, 18.5% joint edema, and 3.1% joint redness. No significant sex differences were found; 60% of patients with pCHIK-CPA aged > 40 years (RR = 3.75; 95%CI 1.47–9.53). The 29.2% of patients required medical attention because of symptoms.

Conclusions: Nearly half of patients with CHIK had at least one rheumatologic symptom persistent over a year, and the third of them, pCHIK-CPA. These results are comparable with previous estimates obtained in other cohorts in the country (Risaralda and Sucre) and are consistent with results from other studies in France and India.

1. Introduction

Chikungunya virus disease (CHIKV) has expanded in Latin America since 2013, with a clear increase in the epidemiological and disability burden, by high morbidity attributed to its acute phase, as well as by persistence of symptoms in its chronic phase and consequences [1,2]. There is an association between CHIKV and subsequent development of

unspecified arthritis or rheumatoid arthritis, seronegative spondylitis and other non-inflammatory musculoskeletal manifestations such as persistent arthralgia [3,4]. Post-chikungunya chronic inflammatory rheumatism (pCHIK-CIR) is defined as arthritis, musculoskeletal pain or unspecified arthralgia, which persists for more than 3 months after acute infection, without previous history of rheumatic disease or musculoskeletal discomfort [5,6].

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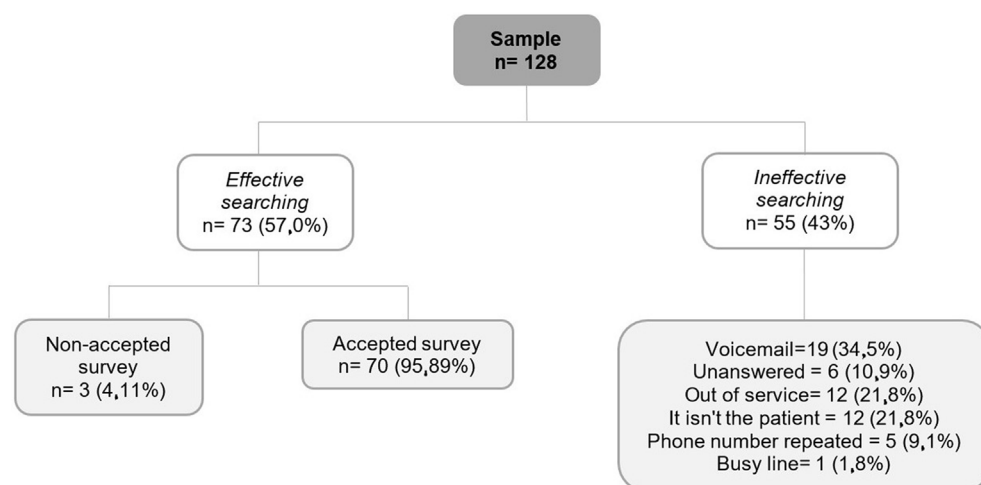


Fig. 1. Searching patients by telephone.

Previous studies, estimate about 47.57% (95%CI 45.08–50.13) of infected patients in endemic areas would develop pCHIK-CIR, with a median follow-up of 20.12 months, during a maximum time of 72 months (6 years); and these sequelae have been reported in tropical and subtropical areas, and also in European countries among imported cases [7,8]. The most recent systematic review and meta-analysis about prevalence of pCHIK-CIR in the literature, describes that in the most conservative scenario, about 25% of CHIK cases could develop this rheumatologic sequel and 14% chronic arthritis [6].

However, those estimates were obtained from studies carried out in France and India [8] and may not be extrapolated to Latin American countries, because of environmental variations by geographical area, genetic and immunological profile of the hosts and variation of the viral characteristics [9]. Therefore, three cohorts have been published in Colombia and Latin America, reporting a significant proportion of cases that progress to pCHIK-CIR, especially polyarthralgia [9–12]. One of these investigations was carried out during 2015 in the municipality of Venadillo in the department of Tolima [11], which is part of the Colombian endemic areas for dengue virus (DENV) and CHIKV, and they share the same vector, *Aedes aegypti* and *A. albopictus* [12]. The initial study in Tolima [11] evidenced that about half of the patients persisted with post-CHIK arthralgia after 24 weeks of follow-up [11], which is higher than the results reported in other countries [13]. All these findings represent a great challenge for infectious diseases, rheumatology and travel medicine practitioners, but still many aspects need to be clarified [14–20].

After one year the initial diagnosis of patients observed in Venadillo, Tolima, Colombia, a new assessment, with the objective to determine the prevalence of chronic rheumatic sequelae attributable to CHIKV, was necessary and done. This, to providing information regard the progression, knowledge and some risk factors, about pCHIK-CIR as a growing consequence of CHIK in Colombia and Latin America. Furthermore, continuing searching for related factors and relevant information in predicting consequences that increase the prevalence and morbidity of this chronic manifestation of CHIKV infection.

2. Methods

This retrospective cohort study included patients previously diagnosed by CHIK positive serology between January and May 2015, belonging to the Venadillo cohort, Tolima, Colombia [11], after a year of initial infection.

2.1. Inclusion criteria

- Patients who had been confirmed as seropositive (IgM specific for

CHIKV), between January and April 2015, Venadillo, Tolima, Colombia. For the IgM ELISA was used, with samples considered positive when the absorbance value was greater than 10% over the cut-off value (Cut-off control: absorbance value, 0.150–1.300).

- Patients who previously complied with the definition of acute case according to the criteria of the National Institute of Health (INS), Bogotá, Colombia: serology plus fever (temperature > 39 °C) and polyarthralgia or arthritis.
- A period of time at least one-year post-infection, between initial diagnosis and evaluation.

2.2. Exclusion criteria

- Personal history of rheumatic disease such as arthritis, osteoarthritis and/or fibromyalgia.

2.3. Variables

Information was updated on sociodemographic data of the patients such as age, location of house, schooling and occupation, at the time of the survey.

Symptoms manifested by patients during the last year after the initial diagnosis of CHIK, were evaluated according to the criteria of the American College of Rheumatology/European League Against Rheumatism 2010 [5], through a telephone survey based on a questionnaire previously used in other studies [9,11], validated by the World Health Organization (WHO) in 2015 [21]. Main outcome was the development of post-CHIK chronic polyarthralgia (pCHIK-CPA). Other symptoms asked, were: joint redness, joint edema and morning stiffness [21]. Attention was also given to the patients' consulting after the diagnosis of CHIKV to general medicine and/or rheumatology, because of symptoms manifested; and the presence of symptoms or clinical diagnosis by health personal compatible with Dengue or Zika virus disease during the period since the diagnosis of CHIK was evaluated. Patients are diagnosed with dengue using RT-PCR (during the first 5 days) and/or serology (ELISA and/or NS1) beyond day 7°. For Zika, only RT-PCR is used for laboratory confirmation.

Search of patients was made through telephone calls and 73 (57%) were effective (Fig. 1). Calls were made to cell phone or landline, according to the records of each patient. Out of the total calls, 81.2% were made from and to cell phone. Participants were contacted at different times of the day and on different dates. After the first failed call up, contact was attempted until 4 times more. Phones out of service or wrong phone number were the most frequent causes of non-contact with participants (Fig. 1). Call time was 3.2 min, on average.

2.4. Statistical analysis

Sociodemographic and clinical characteristics of the population were described and the relative frequencies of chronic rheumatological manifestations were assessed by sex and age groups, estimating the relative risk (RR) with the corresponding 95% confidence intervals (95%CI). All data were recorded in a predesigned format, tabulated and the results analyzed statistically by SPSS® statistical software (version 22).

2.5. Ethical considerations

Ethics approval was obtained from the ESE Hospital Santa Bárbara of Venadillo. Informed consent had already been requested from patients at the initial evaluation of this cohort 6 months after the initial diagnosis. This was complemented by additional verbal consent during the survey.

3. Results

A total of 128 (97.7%) of the 131 patients who were diagnosed by CHIKV positive serology between January and May 2015 in Venadillo, Tolima, completed a period of time at least one year since initial infection in April 2016, when the survey was conducted and they were reassessed.

A total of 73 subjects were contacted, 70 (95.9%) consented to participate in a new telephone survey and 5 (7.1%) were excluded because they had previous history of rheumatic disease. Out of the total participants included, 14 (21.5%) reported Zika virus disease (Fig. 2) after CHIKV infection, but only 28.6% of them attended a medical visit to confirm the diagnosis.

The group of participants was comprised of 36 (55.4%) women and 29 (44.6%) men, with a mean age of 44.34 years (SD 14.71). The 89.2% of surveyed subjects, currently live in urban areas, 44.6% have completed secondary education and 43.1% are employed. The median follow-up was 65.4 weeks (15.3 months), with a maximum time of 68.9 weeks (16.1 months) (Table 1).

Out of the total surveyed subjects, 38 (58.5%) reported at least one persistent rheumatological symptom (pCHIK-CIR). Of these patients,

21% reported arthralgia and they were aged > 40 years old (RR = 1.75, 95%CI, 1.03–2.94) (Table 2). In the week they were assessed, 36.9% presented joint pain and 38.5% morning stiffness (RR = 1.12, 95%CI 0.59–2.15 and RR = 1.43, 95%CI 0.74–2.75, respectively). There was statistical significance according to age.

The prevalence of pCHIK-CPA was 43.1% and according to age, it was 16% in those aged < 40 years old, and 60% in those aged > 40 years old (RR = 1.87, 95%CI 0.86–4.07) with up to 68.4 weeks (16 months) of duration (Table 3). Because of symptoms, 29.2% consulted to generalist physician and 1.5% consulted to rheumatologist (Table 2). Morning stiffness (38.5% prevalence for this study) was another chronic symptom significantly associated with the 50% of subjects aged > 40 years old (RR = 2.5, 95%CI, 1.07–5.80) (Table 2).

In those aged > 40 years old who reported post-CHIK persistent chronic joint pain throughout the month of the survey (51.6%), statistical significance was demonstrated (RR = 3.4, 95%CI, 1.14–10.31).

As stated above, 21.5% of the assessed patients reported Zika virus disease after the CHIKV infection diagnosis, consequently a parallel analysis of prevalence of symptoms between subjects with and without Zika was performed (Tables 4 and 5).

Six subjects (9.2%) of the included participants, disagree to go to the hospital for a new medical assessment included in a future follow-up, because they did not were residing in Venadillo for the moment of the study.

4. Discussion

This study represents one of three cohorts of CHIK patients published in Colombia and followed for chronic rheumatologic sequelae [9–11]. Furthermore, in this cohort it is highlighted that over half of assessed patients, reported at least one persistent rheumatological symptom as a sequel of the first infection along one year and one third of the total, reported pCHIK-PCA even during the week in which the survey was conducted.

Our results are comparable to those obtained in other studies in the country such as La Virginia, Risaralda and Sincelejo, Sucre cohorts in Colombia [2,9]. Likewise, the findings are consistent with estimates of other investigations above mentioned in France and India [8]. The development of pCHIK-CIR was associated with age (data suggest a

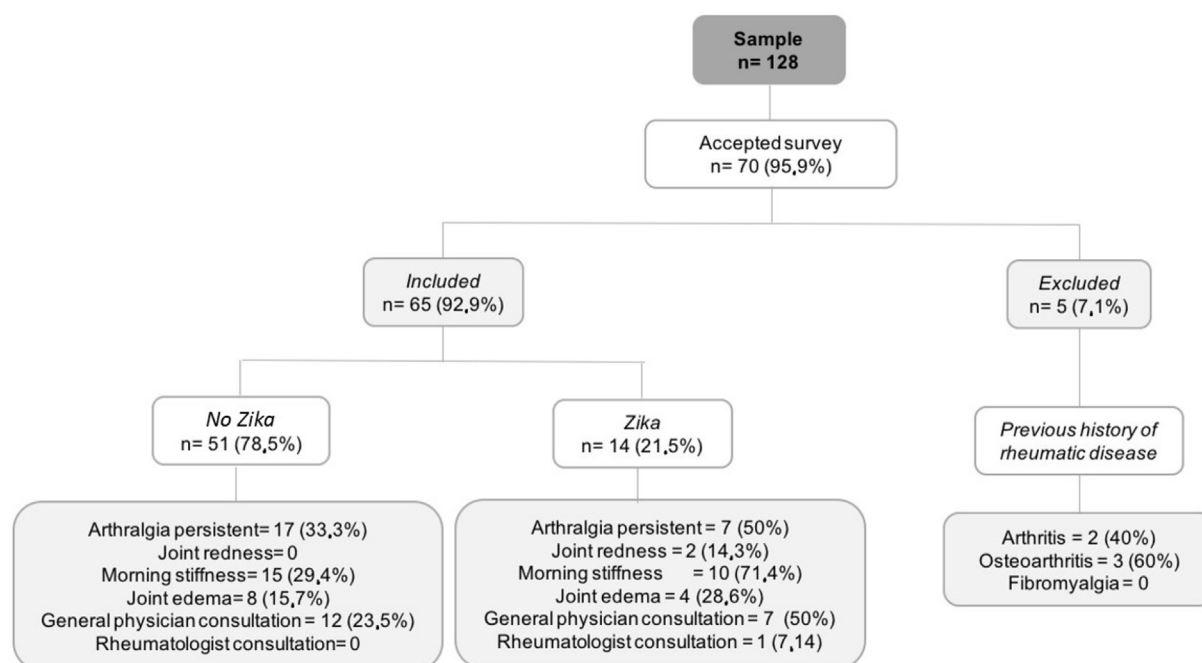


Fig. 2. Subjects included and excluded.

Table 1
Demographic characteristics and time of follow-up of Venadillo, Tolima, Colombia, cohort, by sex.

Demographic characteristics	Sex		Total
	Male	Female	
	n = 29 (44.6%)	n = 36 (55.4%)	n = 65
Age years old (Mean \pm SD)	42.59 (\pm 14.05)	45.75 (\pm 15.28)	44.34 (\pm 14.71)
Location of house			
Urban	27 (41.5%)	31 (47.7%)	58 (89.2%)
Rural	2 (3.1%)	5 (7.7%)	7 (10.8%)
Schooling			
None	0	2 (3.1%)	2 (3.1%)
Primary	9 (13.8%)	12 (18.5%)	21 (32.3%)
Secondary	13 (20%)	16 (24.6%)	29 (44.6%)
Technical	4 (6.2%)	1 (1.5%)	5 (7.7%)
University	3 (4.6%)	5 (7.7%)	8 (12.3%)
Occupation			
Student	0	1 (1.5%)	1 (1.5%)
Employed	19 (29.2%)	9 (13.8%)	28 (43.1%)
Unemployed	3 (4.6%)	2 (3.1%)	5 (7.7%)
Independent	5 (7.7%)	3 (4.6%)	8 (12.3%)
Retired	1 (1.5%)	0	1 (1.5%)
Withdrawn	1 (1.5%)	0	1 (1.5%)
Housewife	0	21 (32.3%)	21 (32.3%)
Time of follow-up			
Weeks (median)	65.7	65.3	65.4
Minimum time	60	59.1	59.1
Maximum time	68.9	68.9	68.9

SD: Standard deviation.

Table 2
Prevalence of post-CHIK rheumatological symptoms in the Venadillo, Tolima, Colombia cohort, by sex and age (older and younger than 40 years).

Rheumatological symptoms	Sex		Total n = 65	RR	95%CI		Age		Total n = 65	RR	95%CI	
	Male	Female					< 40 years	≥ 40 years				
	n = 29	n = 36					n = 25	n = 40				
Arthralgia (Last month)	11 (37.9%)	17 (47.2%)	28 (43.1%)	1.24	0.69	2.22	4 (16%)	24 (60%)	28 (43.1%)	3.75	1.47	9.53
Arthralgia (Last week)	10 (34.5%)	14 (38.9%)	24 (36.9%)	1.12	0.59	2.15	6 (24%)	18 (45%)	24 (36.9%)	1.87	0.86	4.07
Joint redness	2 (6.89%)	0	2 (3.1%)	N/A			0	2 (5%)	2 (3.1%)	NA		
Morning Stiffness	9 (31%)	19 (52.8%)	25 (38.5%)	1.43	0.74	2.75	5 (20%)	20 (50%)	25 (38.5%)	2.50	1.07	5.80
Joint edema	3 (10.3%)	9 (25%)	12 (18.5%)	2.41	0.71	8.11	3 (12%)	9 (22.5%)	12 (18.5%)	1.87	0.56	6.20
At least one persistent symptom	14 (48.3%)	24 (66.7%)	38 (58.5%)	1.38	0.88	2.14	10 (40%)	8 (20%)	38 (58.5%)	1.75	1.03	2.94
Medical consultations												
General physician	6 (20.7%)	13 (36.2%)	19 (29.2%)	1.74	0.75	4.02	0	19 (47.5%)	19 (29.2%)	N/A		
Rheumatologist	0	1 (2.8%)	1 (1.5%)	N/A			0	1 (2.5%)	1 (1.5%)	N/A		

RR: Relative risk; 95%CI: Confidence interval; pCHIK-CPA = post-Chikungunya chronic polyarthralgia.
In bold those RR statistically significant.

higher persistence of symptoms at older age), but no association was found with sex. Additionally, up to 30% of patients consulted general physician for persistent symptoms, which shows how important these manifestations are in the daily lives of those suffer from them.

The risk of developing chronic rheumatologic manifestations by CHIKV, remains a challenge for researchers and an aspect not yet clear or fully known. Time of joint affectation is still uncertain. However, as set out in European studies pCHIK-CIR can persist even after 6 years since acute infection in 59% of patients evaluated in Réunion, France [15]. This study shows a duration of last longer than one year (16 months) for joint symptoms in CHIKV-infected subjects. More studies

are needed to determine if there is a limited duration of symptoms and its intensity, to have greater perspective of disease chronic phase impact.

This cohort represents the second largest in Colombia, for the follow-up of post-CHIK rheumatologic sequelae (La Virginia, Risaralda, first place) and is the first study in Tolima region of that kind. Tolima belongs the Colombian endemic areas for the DENV and for viruses that share a vector with it, such as CHIKV and Zika [12]. Zika occurred in more than fifth of the patients that had before chikungunya. This is consistent with epidemiological reports of the region [12] and also implies the possible sequence of other arboviral diseases in the future

Table 3
Duration of pCHIK-CPA in Venadillo, Tolima, Colombia cohort, by sex and age groups.

	Sex		Total 65	Age group			Total 65
	Male	Female		20–24	25–29	≥ 30	
	n = 29 (44.6%)	n = 36 (55.4%)		n = 5 (7.7%)	n = 8 (12.3%)	n = 52 (80%)	
Days							
Mean	268.7	322.2	298.4	300.4	230.5	308.6	298.4
Median	331	446	423	370	224.5	439	423
Minimum	5	29	5	57	7	5	5
Maximum	472	479	479	453	458	479	479
Weeks							
Mean	38.4	46.0	42.6	42.9	32.9	44.1	42.6
Median	47.3	63.7	60.4	52.9	32.1	62.7	60.4
Minimum	0.7	4.1	0.7	8.1	1.0	0.7	0.7
Maximum	67.4	68.4	68.4	64.7	65.4	68.4	68.4
Months							
Mean	9.0	10.7	9.9	10.0	7.7	10.3	9.9
Median	11.0	14.9	14.1	12.3	7.5	14.6	14.1
Minimum	0.2	1.0	0.2	1.9	0.2	0.2	0.2
Maximum	15.7	16.0	16.0	15.1	15.3	16.0	16.0

pCHIK-CPA = post-Chikungunya chronic polyarthralgia.

on the same population and at this cohort.

According to the recent data provided by the INS epidemiological bulletin, Tolima ranks fourth in the country with 7205 Zika cases by week 52 of 2016 (883 confirmed by RT-PCR) [16]. For this reason, we considered the existence of symptoms corresponding to acute infection

by DENV and Zika, manifested by the patients. One fifth part of the patients expressed symptoms or clinical diagnosis by health personal, compatible with Zika, for which a parallel analysis of prevalence of symptoms between subjects with and without Zika was performed. The prevalence was higher in the group with Zika (50%) than the group without Zika post-CHIKV infection (33%).

With further studies, it may be possible to prove if initial CHIKV infection is a risk factor for Zika virus disease, or if infection by other viruses after CHIKV increases likelihood of prolonging and/or intensifying the symptoms of the chronic phase. It cannot be ruled out that there are other cases of double or even triple co-infection (dengue, chikungunya and Zika), as has been reported in Colombia in 2015 [17] and it is also a key point to continue researching.

The existence of information bias within limitations of this study is likely, since data were collected through a telephone interview. However, the data found are consistent and proportional to those found in other studies, especially the association of age with chronic polyarthralgia and rheumatologic symptoms in general, persistent over time. Although on this occasion, personal history of rheumatic disease was questioned and even the existence of it was exclusion criteria for the analysis, the absence of clinical confirmation of the symptoms reported, a clear treatment received later, as well as the lack of immunological and serological confirmation, are very important limitations to take into account when continuing with similar investigations.

Another possible limitation is the power of the study, which is conditioned by the number of patients that could be surveyed, because of there was not up-to-date contact information for many of them. However, there are other small and recent studies with similar results to

Table 4
Prevalence of pCHIK-CPA and other rheumatological symptoms in Venadillo, Tolima, Colombia cohort, by sex, age groups and subsequent diagnosis of Zika.

No Zika										
Arthralgia	Male	Female	Total	RR	95%CI		Age group			Total
	n = 25	n = 26	n = 51				20-24 (n = 40)	25-29 (n = 4)	≥ 30 (n = 7)	n = 51
Last month	9 (36%)	10 (38.5%)	19 (37.3%)	1.060	0.52	2.18	1 (25%)	1(14.3%)	17 (42.5%)	19 (37.3%)
Last week	8 (32%)	9 (34.6%)	17 (33.3%)	1.082	0.49	2.35	1 (25%)	3 (42.9%)	13 (32.5%)	17 (33.3%)
Zika Arthralgia	Male n = 4	Female n = 10	Total n = 14	RR	95%CI		Age group			Total
							20-24 (n = 12)	25-29 (n = 1)	≥ 30 (n = 1)	n = 14
Last month	2 (50%)	7 (70%)	9 (64.3%)	1.400	0.48	4.04	1 (100%)	0	8 (66.7%)	9 (64.3%)
Last week	2 (50%)	5 (50%)	7 (50%)	1.000	0.31	3.18	0	0	7 (58.3%)	7 (50%)
No Zika Rheumatological symptoms	Male n = 25	Female n = 26	Total n = 51	RR	95%CI		Age group			Total
							20-24 (n = 4)	25-29 (n = 7)	≥ 30 (n = 40)	n = 51
Joint redness	0	0	0	N/A			0	0	0	0
Morning Stiffness	7 (28%)	8 (30.8%)	15 (29.4%)	1.09	0.46	2.57	1 (25%)	2 (28.6%)	12 (30%)	15 (29.4%)
Joint edema	1 (4%)	7 (26.9%)	8 (15.7%)	6.70	0.89	50.84	2 (50%)	0	6 (15%)	8 (15.7%)
Al least one persistent symptom	12 (48%)	15 (78.7%)	27 (52.9%)	1.20	0.71	2.03	3 (75%)	3 (42.9%)	21 (52.5%)	27 (52.9%)
Zika Rheumatological symptoms	Male n = 4	Female n = 10	Total n = 14	RR	95%CI		Age group			Total
							20-24 (n = 1)	25-29 (n = 1)	≥ 30 (n = 12)	n = 14
Joint redness	2 (50%)	0	2 (14.3%)	N/A			0	0	2 (16.7%)	2 (14.3%)
Morning Stiffness	2 (50%)	8 (80%)	10 (71.4%)	1.6	0.57	4.47	0	0	10 (83.3%)	10 (71.4%)
Joint edema	2 (50%)	2 (20%)	4 (28.6%)	0.4	0.08	1.94	0	0	4 (33.3%)	4 (28.6%)
Al least one persistent symptom	2 (50%)	9 (90%)	11 (78.6%)	1.8	0.6	4.9	1 (100%)	0	10 (83.3%)	11 (78.6%)

RR: Relative risk; 95%CI: 95% Confidence interval; pCHIK-CPA = post-Chikungunya chronic polyarthralgia.

Table 5

Prevalence of pCHIK-CPA and other rheumatological symptoms in Venadillo, Tolima, Colombia cohort by age (older and younger than 40 years) and subsequent diagnosis of Zika.

No Zika						
Arthralgia	Age		Total n = 51	RR	95%CI	
	< 40 years	≥ 40 years				
	n = 20	n = 31				
Last month	3 (15%)	16 (51.6%)	19 (37.3%)	3.400	1.140	10.310
Last week	5 (25%)	12 (38.7%)	17 (33.3%)	1.540	0.640	3.720
Zika						
Arthralgia	Age		Total n = 14	RR	95%CI	
	< 40 years	≥ 40 years				
	n = 5	n = 9				
Last month	1 (20%)	8 (88.9%)	9 (64.3%)	4.400	0.75	26.04
Last week	1 (20%)	6 (66.7%)	7 (50%)	3.330	0.54	20.42
No Zika						
Rheumatological symptoms	Age		Total n = 51	RR	95%CI	
	< 40 years	≥ 40 years				
	n = 20	n = 31				
Joint redness	0	0	0	N/A		
Morning Stiffness	4 (20%)	11 (35.5%)	15 (29.4%)	1.770	0.650	4.800
Joint edema	3 (15%)	5 (16.1%)	8 (15.7%)	1.075	0.280	4.010
At least one persistent symptom	8 (40%)	19 (61.3%)	27 (52.9%)	1.530	0.830	2.280
Zika						
Rheumatological symptoms	Age		Total n = 14	RR	95%CI	
	< 40 years	≥ 40 years				
	n = 5	n = 9				
Joint redness	0	2 (22.2%)	2 (14.3%)	N/A		
Morning Stiffness	1 (20%)	9 (100%)	10 (71.4%)	5.000	0.860	28.860
Joint edema	0	4 (44.4%)	4 (28.6%)	N/A		
At least one persistent symptom	2 (40%)	9 (100%)	11 (78.6%)	2.500	0.850	7.310

RR: Relative risk; 95%CI: 95% Confidence interval; pCHIK-CPA = post-Chikungunya chronic polyarthralgia.

those obtained in this research. One of these was the telephone follow-up of patients registered at the Bronx-Lebanon Hospital in New York, where one third (37%) of the participants reported symptoms 9 months after the diagnosis of CHIK, which included joint pain (32%), muscle pain (32%) and joint inflammation (26%). A presumptive diagnosis of post-CHIK chronic inflammatory arthritis in 4 participants and post-CHIK musculoskeletal disorder in 3 people, could be established [18].

It is important to continue looking for the missing patients, in order to expand the analysis. It's also necessary to develop prospective studies to clarify and confirm risk factors, and to determine the degree of disability resulting from the rheumatological sequelae and their impact not only on quality of life, but also potential years of life lost.

The burden of CHIK in Latin America is an emerging concern. Recent estimates indicate that between 385,835 and 429,058 patients in Latin America will develop pCHIK-CIR [7]. Based on these data and in connection with the CHIK epidemic in 2014, disability-adjusted life-years for RIC-pCHIK in Latin America by country were estimated. As no disability weight is available for pCHIK-CIR, the disability weight reported for rheumatoid arthritis (RA) (0.233) was used. Expected incident cases progressing to pCHIK-CIR and its duration were assumed on the basis of previous studies. According to the estimates generated on that study, the expected lower limit burden of pCHIK-CIR in Colombia is 14 793 disability-adjusted life-years [19] and, although it does not surpass the figure reported in the epidemic in India 2006

(25,888) [20], it represents a troubling amount and a high level of disability. Recently, in Risaralda, has been studied and highlighted, the significant level of impairment in the quality of life of patients with pCHIK-CIR is evident [22], as also has been reported in a recent systematic review [23].

Hence, CHIK is not only a new disease with many aspects not yet clear, but also a problem of great interest in public health in the country as well as in Latin America [14]. Its chronic phase proves to be much more important than is known, by morbidity burden, disability and limiting conditions for the daily activities of people infected at some point in their lives, even beyond the rheumatological consequences, as has been recently highlighted, at mental health too [23,24]. This research, once again demonstrates that the risk of persistent articular symptoms and polyarthralgia in a chronic condition post-CHIKV increases directly proportional to the age of the sufferer and probably the subsequent infections by other arboviruses will potentiate chronic affections, both in duration and intensity. More studies in Colombia and Latin America are needed, particularly prospective studies in order to demonstrate and analyze mainly this last aspect as well other associated.

Conflicts of interest

The authors have no conflicts of interest to disclose.

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