

# **Molecular diagnosis and clinical characteristics of Chikungunya** Virus infections in the Peruvian jungle, 2020-2023

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### BACKGROUND

Chikungunya virus (CHIKV) infections symptoms that can progress to joint pain and arthritis over time. In 2015, cause acute febrile illness associated with unspecific Peru reported its first autochthonous case, followed by an outbreak nationwide. Peruvian Andean and jungle regions report prevalence rates ranging between 2.4% and 9.4%, sometimes surpassing dengue as the primary cause of AFI. In high-risk areas, it is important to differentiate CHIKV infection from other arboviruses due to its concurrent circulation.



## METHODS

To evaluate the prevalence and clinical manifestations of CHIKV in Peruvian patients, we conducted a study in the Peruvian jungle. AFI patients were enrolled if they had a 38°C axillary temperature and a source of infection that was unknown. Infection signs and symptoms were recorded using a standardized format after they were evaluated. Blood samples were collected for the detection of CHIKV infection by qRT-PCR and/or IgM detection using ELISA assays.





**Figure 1.** Monthly distribution of positive CHIKV cases

**Table 2.** Clinical signs and symptoms of patients with CHIKV infection

	Total	CHIKV qRT-PCR	CHIKV IgM
	N=4204 (%)	N=247 (%)	N=437 (%)
<b>Clinical symptoms</b>			
Headache	3748 (89.15)	217 (87.85)	394 (90.16)
Myalgia	3237 (77.00)	191 (77.33)	324 (74.14)
Arthralgia	3219 (76.57)	185 (74.90)	345 (78.95)
Fever	3105 (73.86)	166 (67.21)	334 (76.43)
Retroocular pain	2218 (52.76)	120 (48.58)	258 (59.04)
Hand polyarthralgia	2138 (50.86)	103 (41.70)	252 (57.67)
Foot polyarthralgia	1972 (46.91)	97 (39.27)	229 (52.40)
Nausea	1669 (39.70)	88 (35.63)	188 (43.02)
Vomiting	1586 (37.73)	86 (34.82)	188 (43.02)
Lumbar pain	1570 (37.35)	89 (36.03)	158 (36.16)
Skin rash	395 (9.40)	29 (11.74)	43 (9.84)
Nonpurulent conjunctivitis	250 (5.95)	11 (4.45)	28 (6.41)
Arthritis	175 (4.16)	13 (5.26)	10 (2.29)
Throat pain	27 (0.64)	2 (0.81)	2 (0.46)
Conjunctival injection	25 (0.59)	2 (0.81)	2 (0.46)
Lack of appetite	20 (0.48)	0 (0.00)	2 (0.46)
Warning sings			
Intense and continuous abdominal pain	127 (3.02)	4 (1.62)	17 (3.89)
Chest pain or Disnea	18 (0.43)	1 (0.40)	1 (0.23)
Hepatomegaly	12 (0.29)	1 (0.40)	1 (0.23)
Persistent vomiting	6 (0.14)	0 (0.00)	0 (0.00)
Diuresis decrease	2 (0.05)	0 (0.00)	0 (0.00)
Ascites or pleural effusion	1 (0.02)	1 (0.4)	0 (0.00)
Hypothermia	1 (0.02)	0 (0.00)	0 (0.00)
Tachycardia	1 (0.02)	0 (0.00)	0 (0.00)
PA differential <20 MMHg	1 (0.02)	0 (0.00)	0 (0.00)
NA	209	9	35

During the study period (2020 through 2023), a total of 4413 patients with AFI were enrolled. 256 (5.80%) CHIKV cases were identified by qRT-PCR, and 472 (10.69%) were identified by IgM detection. Most infected patients were adults aged between 18-39 years (52.73% for qRT-PCR positive and 49.15% for IgM positive), with females being the predominant affected gender (54.69% for qRT-PCR positive and 62.92% for IgM positive). The most common clinical symptoms in CHIKV qRT-PCR and IgM positive patients were headaches (87.85% and 90.16%), myalgias (77.33% and 74.14%), and arthralgias (74.90% and 78.95%). The highest number of positive cases occurred in July 2021 (10.45%).

**Table 1.** Demographical characteristic of the patients with CHIKV infection



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### CONCLUSION

In conclusion, our study underscores the substantial burden of Chikungunya virus (CHIKV) in the Peruvian jungle, revealing notable prevalence rates among patients with acute febrile illness. In regions where CHIKV co-circulates with other arboviruses, robust surveillance and diagnostic efforts are particularly important. It is crucial to understand the epidemiology and clinical presentation of CHIKV infection in order to develop effective disease management and control strategies.

Age (years)

< 5	36 (0.82)	0 (0.00)	17 (3.60)
5 a 11	205 (4.65)	10 (3.91)	28 (5.93)
12 a 17	364 (8.25)	24 (9.38)	50 (10.59)
18 a 39	2189 (49.60)	135 (52.73)	232 (49.15)
40 a 59	1004 (22.75)	49 (19.14)	85 (18.01)
$\geq 60$	406 (9.20)	29 (11.33)	25 (5.30)
NA	209 (4.74)	9 (3.52)	35 (7.42)
Gender			
Masculino	1822 (41.29)	116 (45.31)	159 (33.69)
Femenino	2518 (57.06)	140 (54.69)	297 (62.92)
NA	73 (1.65)	0 (0.00)	16 (3.39)

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