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Chikungunya infection in Peruvian patients with acute febrile illness: prevalence and clinical characteristics

Miguel Angel Aguilar-Luis[1,2]; Hugh Watson[3]; Carlos Holguin[4]; Yordi Tarazona-Castro[1,2]; Brenda Tapia[4]; Wilmer Silva-Caso[1]; Juana del Valle-Mendoza[1,2]

[1]Biomedicine laboratory, Research Center of the Faculty of Health Sciences, Universidad Peruana de Ciencias Aplicadas, Lima, Peru [2]Laboratorio de Biología Molecular, Instituto de Investigacion Nutricional, Lima, Peru [3] Antiviral Research Unit, Evotec ID, Lyon, France [4]Laboratorio de Referencia Regional Piura, Direccion Regional de Salud Piura, Piura.

BACKGROUND

Chikungunya fever (CHIKF) is an emerging zoonotic disease that presents as an acute febrile illness (AFI), classically associated with arthralgia. Due to limitations regarding availability of diagnostic tests and health system access, cases may be underreported. Therefore, we performed a study to evaluate in the northern coast of Peru to measure its prevalence and describe their clinical manifestations.

METHODS

We conducted a 2-year cross-sectional study in Piura region, Peru, located in the north coast of Peru, neighboring Ecuador, and Colombia. Patients presenting with AFI to primary care clinics were included. Serum plasma collection was performed in all participants and evaluated for chikungunya virus (CHIKV) serology and molecular diagnosis with RT-PCR. Our study location was also endemic for Dengue virus (DENV); thus, IgM was also analyzed for coinfection evaluation.

RESULTS

A total of 688 samples were collected and 669 were analyzed. CHIKV was detected in 60 (8.89%) samples through serology. Only 5% of the cases were identified with RT-PCR. CHIKV cases were most reported among participants aged 18-29 years old (30.0%) and the most common symptoms reported were headaches (68.0%), myalgias (54.4%) and arthralgias (50.8%). Coinfection with DENV was also reported (5.0%) among CHIKV samples. We report a significant prevalence of CHIKV in a northern coast of Peru and a considerable prevalence of CHIKV-DENV coinfection.

Table 1. Demographic characteristic of the patients with CHIKV infection.

Characteristic	Total N=669 (%)	CHIKV positive by PCR N=5 (%)	CHIKV positive by IgM N=60 (%)	CHIKV positive by IgG N=10 (%)	DENV-CHIKV co-infection*
Age (years)					
< 5	35	0	7	0	1
6 - 11	55	1	3	1	0
12 - 17	91	0	11	2	1
18 - 29	230	0	18	4	1
30 - 39	104	2	10	2	0
40 - 49	62	0	5	1	0
50 - 59	50	2	4	0	0
≥ 60	42	0	2	0	0
Sex					
Male	301	2	21	2	2
Female	368	3	39	8	2
Pregnance	43	0	2	1	0

*Co-infection is defined as DENV IgM positive and CHIKV PCR and/or IgM positive.

Table 2. Clinical signs and symptoms of patients with Chikungunya infection

Clinical symptoms	Total N=669 (%)	CHIKV positive by PCR N=5 (%)	*P-value (Chi-square test)*	CHIKV positive by IgM N=62 (%)	*P-value (Chi-square test)*	CHIKV positive by IgG N=10 (%)	*P-value (Chi-square test)*	DENV-CHIKV co-infection
Headache	455 (68.0)	5	0.124	34	0.048	8	0.413	4
Myalgia	340 (50.8)	4	0.190	30	0.894	4	0.490	2
Arthralgia	364 (54.4)	2	0.516	32	0.861	2	0.028	1
Low back pain	290 (43.3)	2	0.879	28	0.587	6	0.284	2
Ocular and retro-ocular pain	289 (43.2)	3	0.446	23	0.425	2	0.136	3
Nauseas	188 (28.1)	4	0.010	13	0.245	3	0.893	1
Vomiting	162 (24.2)	4	0.003	15	0.882	3	0.667	2
Rash or exantema	85 (12.7)	1	0.623	7	0.800	0	0.224	1
Arthritis	56 (8.4)	2	0.010	3	0.323	0	0.336	0
Non-purulent conjunctivitis	39 (5.8)	1	0.175	7	0.043	1	0.571	0
Lack of apetite	20 (3.0)	1	0.025	3	0.338	0	0.576	0
Sore throat	11 (1.6)	1	0.001	2	0.281	0	0.680	0
Purulent conjunctivitis	6 (0.9)	1	0.000	0	0.440	0	0.762	0
Others symptoms								
Diarrhea	5	1	0.000	0	0.481	1	0.001	0
Diarrhea and abdominal pain	2	0	0.902	0	0.657	0	0.861	0
Diarrhea y backache	1	0	0.931	1	0.001	0	0.902	0
Diarrhea and sweating	85	0	0.392	8	0.878	0	0.224	1
Abdominal pain	5	0	0.846	0	0.481	0	0.782	0
Shivers	13	0	0.752	2	0.414	0	0.654	0
Shivers and diarrhea	2	0	0.902	0	0.657	0	0.861	0

Table 3. CHIKV diagnosis according to day of onset of symptoms

Days after the onset of symptoms	Total N=669 (%)	Total CHIKV	CHIKV positive by PCR N=5 (%)	CHIKV positive by IgM N=60 (%)	CHIKV positive by IgG N=10 (%)
0	30	1	0	1	0
1	97	8	1	6	1
2	132	15	2	12	1
3	141	22	0	17	5
4	81	6	0	4	2
5	64	4	1	3	0
6	43	5	0	5	0
7	30	3	0	2	1
8	15	3	1	2	0
9	9	1	0	1	0
10	7	0	0	0	0
11	3	0	0	0	0
12	2	1	0	1	0
13	9	2	0	2	0
14	4	1	0	1	0
15	4	1	0	1	0
>=16	17	4	0	4	0

CONCLUSION

These results highlight the need for improved surveillance of CHIKV, as it is a continuously transmitted pathogen in various parts of Peru. To accurately detect CHIKV, epidemiological surveillance should be strengthened using reliable diagnostic methods, as clinical symptoms may be unspecific.

CONTACT
Miguel Angel Aguilar Luis, PhD
Universidad Peruana de Ciencias Aplicadas
Email: Ma23aguilar@gmail.com
Email: Miguel.aguilar@upc.pe
Phone: +51 985 032 252
Lima, Peru