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CLINICAL-EPIDEMIOLOGICAL PROFILE OF THE CHIKUNGUNYA ARBOVIRUS IN THE MUNICIPALITY OF MARABÁ FROM 2016 TO 2017

Bianca Alves Damasceno
Students of the Biomedicine course at: Universidade do Estado do Pará - UEPA, Campus VIII (Marabá)

Juliana Maciel Conceição
Students of the Biomedicine course at: Universidade do Estado do Pará - UEPA, Campus VIII (Marabá)

Terezinha de Jesus Cabral Martins
Students of the Biomedicine course at: Universidade do Estado do Pará - UEPA, Campus VIII (Marabá)

Maíra Catherine Pereira Turiel Silva
Professor of: Universidade do Estado do Pará - UEPA, Campus VIII (Marabá)

INTRODUCTION

Arboviruses are diseases known to be transmitted to humans and other animals through the bite of hematophagous arthropods. Within the group of arbovoritic infections, Chikungunya, Dengue, Yellow Fever and Zika have stood out for having a great impact on public health, since, in addition to causing serious clinical conditions, they can trigger epidemic outbreaks with major social and economic shocks. The symptoms caused by these diseases are very similar and range from undifferentiated, moderate or severe fever, skin eruptions and arthralgia, hemorrhagic syndrome and other manifestations.

Chikungunya is a pathology that can be avoided, however, there has been a persistence of cases of these diseases in Brazil since they were introduced. This fact points to serious deficiencies in programs, surveillance and control bodies that aim to reduce the occurrence of cases of these diseases in the country. At the regional level, we have the state of Pará identified as one of the states with a high risk of arbovirus epidemics and at the local level, the city of Marabá is included among the cities in the southeast of Pará with the highest incidence of Chikungunya, second only to the capital Belém

Such findings demonstrate the importance and need for a study that outlines the panorama and the clinical-epidemiological profile of this arbovirus in the municipality, in the pursuit of at the same time providing contributions to satisfy the lack of research on these diseases at the local level and to provide that promotion actions and prevention are more effective.

METHODOLOGY

Descriptive, retrospective study with a quantitative and analytical approach, which used secondary data from the Notifiable Diseases Information System (SINAN) provided by the Department of Epidemiological Surveillance of the Municipal Health Secretariat (SEMSA) of Marabá, to identify the clinical profile -epidemiology of the Chikungunya arbovirus in the period from 2012 to 2016.

The data obtained were tabulated using Microsoft Excel 2010 and analyzed using the Bioestat program version 5.3 using ANOVA 1 and 2 criteria (post Tukey test), G Test and Chi Square Test. Significance level was considered when the probability (p) of the occurrence of the event was $p > 0.05$.

RESULTS

Between January 2016 and December 2017, 425 cases of Chikungunya were reported in the Information System for Notifiable Diseases (SINAN) in the municipality of Marabá, with a total of 122 cases ± 3.30 (28.71%) in 2016 and 303 cases ± 11.41 (71.29%) in 2017, therefore, there was an increase between the years from 2016 to 2017 (G test 0.5; 11= 426.5561, $p<0.01$). Epidemiological variables are shown in Table 1.

Among the 425 total cases reported, 304 ± 50 (71.53%) were female, followed by 121 ± 40.5 (28.47%) male cases. The number of female cases was higher than that of males throughout the observed period ($p=0.0005$, x20, 05;1 calc= 12.2561).

Most cases affect the age group of 30 years or older, with 53.18% (226 ± 55) when compared to other age groups ($f_{0,05;6}=39.3968$, $p<0,0005$), while the population aged 1 year or less was the least affected with 0.47% of cases (2 ± 1).

The urban area recorded 84.94% (361 ± 65.5) of cases ($p=0.0029$, $x^2_{calc}= 11.6828$, $df=2$). In all years, a superiority of cases was observed in brown individuals with 78.35% (333 ± 69.5 cases) followed by white individuals

Characteristics	2016		2017		Error	Total	p-value
	N	%	N	%			
GENDER							
Feminine	102	83,61	202	66,67	50,0	304	0,0005*
Masculine	20	16,39	101	33,33	40,5	121	
Total	122	100	303	100	-	425	
AGE GROUP							
<1 year	2	1,63	0	0	1,0	2	
1 - 4 years	3	2,45	10	3,30	3,5	13	
5 - 9 years	4	3,27	16	5,28	6,0	20	
10 - 14 years	5	4,09	15	4,95	5,0	20	
15 - 19 years old	9	7,37	28	9,24	9,5	37	
20 - 29 years old	41	33,60	66	21,78	12,5	107	
30 e+	58	47,54	168	55,44	55,0	226	0,0005**
Total	122	100	303	100	-	425	
ZONE OF RESIDENCE							
urban	115	94,26	246	81,19	65,5	361	0,0029*
Rural	7	5,74	56	18,48	24,5	63	
periurban	0	0	1	0,33	1,41	1	
Total	122	100	303	100	-	425	
RACE/COLOR							
Ign/White	0	0	2	0,66	1,0	2	
Brown	97	79,50	236	77,88	69,5	333	0,0001**
White	18	14,75	47	15,51	14,5	65	
Black	5	4,09	16	5,28	5,5	21	
Yellow	2	1,63	1	0,33	0,5	3	
Indigenous	0	0	1	0,33	0,5	1	
Total	122	100	303	100	-	425	
SCHOLARITY							
Ign/White	66	54,09	137	45,21	35,5	203	
Complete high school	14	11,47	37	12,21	11,5	51	
5th to 8th grade incomplete E.F.	11	9,01	23	7,59	6,0	34	
Incomplete high school	7	5,73	25	8,25	9,0	32	
Not applicable	8	6,55	18	5,94	5,0	26	
4th complete series of the E.F.	6	4,91	15	4,95	4,5	21	
Complete primary education	2	1,63	16	5,28	7,0	18	
1st to 4th incomplete series of the E.F.	1	0,81	14	4,62	6,5	15	
Completed higher education	6	4,91	6	1,98	0	12	
Incomplete higher education	1	0,81	8	2,64	3,5	9	
Illiterate	0	0	4	1,32	2,0	4	
Total	122	100	303	100	-	425	

* Chi Square Test.** Test ANOVA two criteria.

Table 1. Epidemiological variables represented in relative and absolute frequency, standard error and significance value of Chikungunya cases reported in Marabá-PA, between 2016 and 2017.

Source: SINAN/Municipal Health Department of Marabá, 2018.

with 15.29% (65 ± 14.5 cases). Black, Yellow, Indigenous and ignored/white presented the lowest percentages with respectively 4.94% (21 ± 5.5 cases), 0.71% (3 ± 0.5 cases), 0.24% (1 ± 0, 5 cases) and 0.47% (2 ± 1.0 cases) ($f_{0,05;5}$=2788.15, p>0,0001).

Regarding the level of education, it was noted that most reported cases of Chikungunya in the municipality of Marabá had completed high school (12%, 51±11.5 cases), while illiterate individuals had the lowest number, with only 4 notifications. (0.94% ± 2), but without statistical significance. The high number of skipped/blank data invalidates the inferential statistic.

With regard to clinical manifestations (Table 2), it was possible to verify that the most frequently reported symptoms were fever 96.23% (123.74 ± 87.5 cases), myalgia 86.11% (98.99 ± 70 cases), headache 80.94% (100.40 ± 71 cases) and arthralgia 75.05% (101.11 ± 71.5 cases). Other clinical signs such as back pain 59.05% (65.76 ± 46.5 cases), nausea 45.17% (35.35 ± 25 cases), rash 39.05% (26.87 ± 19 cases), vomiting 34.11% (28.99 ± 20.5 cases) and retro-orbital pain 30.11% (62.22 ± 44 cases) were also present in a good number of cases.

It was observed that the most used confirmation and discard criterion in this period is the clinical-epidemiological one with 344 ± 100 cases (80.94%), followed by the laboratory criterion, with 81 ± 9.5 cases (19.06%) (p=0.0001, $x^2_{0,05;1calc}$= 53,323).

Regarding hospitalization, among the 425 notified cases, 6.58% of the cases were hospitalized (28 ± 2 cases), however, in 40.70% (30.40 ± 21.5 cases) there were no records of results regarding hospitalization ($f_{0,05;2}$=17.5678, p<0.0002).

Within the period studied with regard to the evolution of the cases, it was verified that almost all patients had a favorable evolution of the disease, that is, they progressed to a cure:

Signals and symptons	YES			NOT			p-value*
	N	%	Error	N	%	Error	
Fever	409	96,23	87,5	16	3,76	3	
Myalgia	366	86,11	70	59	13,88	20,5	0,0138
Headache	344	80,94	71	81	19,05	19,5	
Exanthema	166	39,05	19	259	60,94	71,5	0,0003
Vomit	145	34,11	20,5	280	65,88	70	0,0189
Nausea	192	45,17	25	233	54,82	65,5	0,0006
Back pain	251	59,05	46,5	174	40,94	44	0,1297
Conjunctivitis	43	10,11	7,5	382	89,88	83	
Arthralgia	319	75,05	71,5	106	24,94	19	0,3761
Petechiae	56	13,17	11	369	86,82	79,5	
Leukopenia	6	1,41	0	419	98,58	90,5	0,2456
Retroabdominal pain	128	30,11	44	297	69,88	46,5	0,0001

* p-value: Chi Square Test.

Table 2– Signs and symptoms presented in relative and absolute frequency, arithmetic mean, standard error and significance value of cases of Chikungunya cases reported in Marabá, Pará, in 2016 and 2017.

Source: SINAN/Municipal Health Department of Marabá, 2018.

Caracteristic	2016		2017		Error	Total	p=value
	N	%	N	%			
CONF/DESC. CRITERION							
Laboratory	50	40,98	31	10,23	9,5	81	
Clinical-epidemiological*	72	59,-2	272*	89,77	100	344	0,0001*
Total	122	100	303	100	-	425	
HOSPITALIZATION							
Ing/White	65	53,27	108	35,64	21,5	173	
Yes	12	9,83	16	5,28	2	28	
Not*	45	36,88	179*	59,07	67	224	0,0001*
Total	122	100	303	100	-	425	
EVOLUTION							
Ing/White	0	0	1	0,33	0,5	1	
Cure	122	100	302	99,06	90	424	
Total	122	100	303	100	-	425	

* p-value: Chi square test.

Table 3– Confirmation/discard criteria, hospitalization and evolution represented in relative and absolute frequency, standard error and p value of notified cases of Chikungunya, in Marabá-PA, between the years 2016 and 2017.

Source: SINAN/Municipal Health Department of Marabá, 2018.

425 total cases, 99.76% of the cases (424 ± 90 cases), and only in one of these cases, it was not possible to know the outcome, since there was no record of the evolution, therefore, it was placed as unknown/blank.

DISCUSSION

The most affected sex was female with 71.53% of cases. These data corroborate the studies by Ho et al., (2011), Cunha et al., (2017) and Méndez et al., (2017). Studies with dengue suggest that the prevalence of female cases may be related to the fact that women generally spend more time in the home environment compared to men. Given the presence of vectors in the home and peridomestic environment, longer periods in these places lead to greater exposure to vectors and, thus, greater probability of transmission (VASCONCELOS et al., 1993).

Another explanation for this predominance of involvement in women can be explained through the analysis of studies on demand for health that indicate that women tend, in general, to seek more health services. While the search for outpatient services by men is mostly stimulated by employment or social security (GOMES et al.; 2007; PIMENTEL et al.; 2011).

Regarding the area of residence, most cases belong to the urban area, with 84.94% of cases, similar to the study by Méndez et al., (2017). Given that in the urban cycle man becomes a reservoir of the virus, and the high population density of the urban environment favors the transmission of the virus.

The two kinds of urban transmission vectors,*Ae. aegypti* e *Ae. albopictus*, find in cities favorable environments for replication. The presence of artificial breeding grounds -

open-air containers capable of accumulating rainwater, places to store water for domestic use, and the presence of humans as a food source make the urban environment favorable to the replication and survival of species of *Aedes*. (ALENCAN et al., 2008; ZARA et al., 2016).

The large number of vectors, environmental variables such as temperature and socioeconomic factors can increase the risk of transmission in CHIKV, although the influence of these factors is poorly understood in Brazil, as highlighted by Nunes et al., (2015).

Considering the distribution of CHIKV cases according to age group, there was a predominance of people aged 30 years or older, followed by the 20-29 age group, while the earlier age groups had the lowest number of cases. registered cases. The higher incidence of cases in adults when compared to children corroborates with studies carried out in South India by Lakshmi et al., (2008), in Western India by Barve et al, (2013), in Singapore by Ho et al., (2011) and in a multicenter study in India by Ray et al., (2012).

The concentration of cases in the population over 20 years old suggests a greater involvement of the adult and economically active population, in which, in the performance of their daily functions, they are in contact with other environments and people and, therefore, increase the risk of CHIKV transmission. According to research by Ritz et al., (2015), cases of asymptomatic infections are more common in children (35-40%) than in adults (16-27%), another fact that favors the pattern found in this study. study.

With regard to the race/color variable, the one that had the highest frequency in the municipality of Marabá was brown (79.50%), an explanation for this high rate found in the municipality can be given due to the state of Pará, as well as the region North of the country, having a mostly brown population (SILVA, 2017). Furthermore, it was not possible to find studies that demonstrate a correlation/ pattern between color and Chikungunya, and/or how a certain race can influence, have some association or increase the risk for this pathology.

As for the evaluation of the level of education, it was noted that there was a certain pairing in the levels of education, that is, there was not, in general, a pattern that stood out in relation to this criterion.

Completed secondary education stood out as being more frequent in cases (11.47%), however, what drew attention was the high proportion of ignored/white in this variable (54.03%), which makes a more consistent analysis impossible. of this issue. This corroborates what some authors show about the problems related to the disease notification process, especially in sociodemographic variables (BOVENDORP et al., 2014; GALVÃO et al., 2009).

Confirmed cases of Chikungunya reported in Marabá from 2016 to 2017 were based on clinical-epidemiological and laboratory criteria. It must be noted, however, that most 80.94% of the cases were classified using the clinical-epidemiological criteria. This predominance, however, was not surprising, since the clinical-epidemiological is the primary parameter adopted by the Ministry of Health for the confirmation of Chikungunya cases in localities where there are autochthonous cases, making the confirmation faster and more effective. Laboratory confirmation, in turn, is usually performed in atypical cases or deaths (FIOCRUZ, 2015; CANELLA, 2017).

Of the CHIKV cases reported in Marabá from 2016 to 2017, it was observed that the pathology did not trigger more serious complications, since only 6.58% of the study

population were hospitalized and 99.76% of the total cases were undergoing treatment. for healing. This issue of the low lethality of Chikungunya is well verified in the literature, although studies such as those by Schuffenecker et al. (2006) agree that, despite being a low mortality disease, it presents a high degree of morbidity, due to persistent arthralgia, verified in many cases, which can cause great damage to the quality of life of the affected individual.

This analysis of the compromised quality of life of patients who had Chikungunya is frequently mentioned in the literature. Proof of this is that observational studies have shown that more than half of the individuals persisted with arthralgia and joint edema three years after the acute infection. Furthermore, it was verified that joint manifestations in the chronic phase of the infection can assume a profile very similar to the characteristics of rheumatological diseases. Studies such as those by Javelle et al. (2015), guide this question, showing that of the total chronic cases admitted in their study, 70% of these had characteristic patterns of rheumatic chronic inflammatory disease, and none of these had a history of rheumatological disease before the infection (BORGHERINI et al, 2008; MORO et al, 2012; SCHILTE et al, 2013).

It is important to emphasize that in this study there were high percentages of ignored/ blanks in several variables, such as the case of Hospitalization, which in 40.70% of the total cases there was no record, which is even a determining variable to evaluate the behavior of the disease and evolution of the cases. In view of this high proportion of ignored cases, we can assume that many cases were not concluded, thus preventing a more accurate assessment and more forceful refinement of the disease profile (BRASIL, 2016).

The vast majority of cases notified in Marabá during the analyzed period had symptoms in line with the literature given through the analysis of the profile of cases and clinical signs of CHIKV. Works such as those by Donalisio et al. (2017) and Gérardin et al. (2008) indicate that the most common symptoms of Chikungunya include fever, headache, myalgia and arthralgia, in agreement with our data, since such clinical manifestations were frequently mentioned in our study. Furthermore, it was also verified in this work that there was a high frequency of reports of fever and arthralgia in the cases studied, which was of great value for the analysis carried out, given that such clinical parameters are used as predictors for the confirmation of Chikungunya (SERGON et al., 2008; FIOCRUZ, 2015).

In general, most of the clinical signs reported in the analyzed cases are related to the acute phase of the disease, which include clinical manifestations such as fever, headache, back pain, leukopenia and arthralgia. In studies by Moya et al. (2014) such mentioned symptoms fit in the initial phase of the disease, supporting the findings of this work. There was no case in this study that showed atypical signs of infection, such as neurological manifestations, for example. The appearance of petechiae, in turn, was the only hemorrhagic clinical sign that occurred in the reported cases, being present in 13.7% of the cases (MINISTÉRIO DA SAÚDE, 2015).

Furthermore, the symptomatology reported by the cases in the present study had a profile very similar to that of other arboviruses. A fact that reinforces this issue was that initially Chikungunya was included in the "dengue-like" spectrum, due to its great similarity with the symptomatology of dengue (DONALISIO et al., 2017; WEAVER, 2014). Studies such as those by Rezza (2014) point to the similarity between the clinical signs of other pathologies, such as Zika, dengue, malaria, especially in the early stages of the

diseases. Given this, we can presume that cases confirmed by clinical-epidemiological parameters lose strength as determinants in the accurate differentiation between pathologies. For this reason, laboratory diagnosis is essential to perform an accurate diagnosis of the infection, especially in areas where there is co-circulation of arbovirus infection (DONALISIO et al., 2017; CANELLA, 2017).

Judging by what has been exposed, we cannot rule out the possibility of bias in the results obtained, for the reason that during the analysis of the data provided for the study, a large number of ignored or unregistered information was verified in several variables, which unfortunately can compromising the reliability of the actual behavior of the disease in the city.

CONCLUSION

This study allowed, in an unprecedented way, to draw an overview of the behavior of the arboviral disease Chikungunya in the municipality of Marabá from 2012 to 2016. It was possible to verify, through this work, a relevant persistence of these diseases in the municipality. Within this analysis, Chikungunya more frequently affects female individuals, of brown color and with an age range ranging from 20 years old to 30 years old or older who lived in the urban area. With regard to clinical aspects, most of the reported symptoms include: fever, myalgia and headache. In addition, most of the notified cases of the diseases analyzed had a satisfactory evolution, with no complications or atypical manifestations admitted.

It is worth highlighting the limitations imposed mainly with regard to data analysis, such as the issue of the high percentage of ignored/blank information in several essential variables. We can infer, therefore, that this issue unfortunately can lead to a possible information bias, which may compromise and not reflect the real conduct of diseases in the municipality.

This way, the study of the subject highlighted the importance of deepening more and more in research on arboviral diseases such as Chikungunya, mainly at the local and regional level, in addition to the question of the evident growth of these diseases in our country and their characteristics that constitute them. as a serious public health problem. Furthermore, it is expected that the information provided by this research will contribute to future studies on these pathologies, but, above all, will serve to encourage monitoring, intervention and prevention actions in Marabá.

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