



Clinical and epidemiological aspects of elderly patients with Chikungunya fever

Aspectos clínicos e epidemiológicos dos idosos com febre de Chikungunya

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Objectives: to characterize the clinical and epidemiological aspects of elderly people affected by Chikungunya fever. **Methods:** cross-sectional and retrospective study of confirmed cases of Chikungunya fever in elderly people. Frequencies and percentages were calculated for categorical variables. The chi-square test was used for intragroup comparisons of the proportional distribution of variables. **Results:** three hundred elderly were evaluated. There was a predominance of women (63.0%), with a mean age of 70.49 years, brown and black skin color (92.0%), living in the urban area (95.3%), reporting the disease in the chronic phase (57.3%), requiring hospitalization (74.3%), and with comorbidities (63.0%). The most prevalent symptoms were fever and arthralgia (100.0%), headache (98.0%), and low back pain (96.3%). **Conclusion:** cases of Chikungunya fever tend to be more severe in elderly patients and have greater clinical repercussions, especially with the presence of symptoms of pain.

Descriptors: Chikungunya Fever; Aged; Epidemiology; Public Health Nursing.

Objetivos: caracterizar os aspectos clínicos e epidemiológicos dos idosos acometidos pela febre de Chikungunya. **Métodos:** estudo transversal e retrospectivo de casos confirmados de febre de Chikungunya em idosos. Para as variáveis categóricas foram calculadas as frequências e percentuais. Utilizou-se o teste qui-quadrado para comparação de proporções das distribuições das variáveis intragrupos. **Resultados:** foram avaliados 300 idosos com predominância de mulheres (63,0%), idade média de 70,49 anos, cores parda e preta (92,0%), moradores da zona urbana (95,3%), notificados na fase crônica da doença (57,3%), que necessitaram de hospitalização (74,3%) e com comorbidades (63,0%). Os sintomas mais prevalentes foram febre e artralgia (100,0%), cefaleia (98,0%) e lombalgias (96,3%). **Conclusão:** os casos de febre de Chikungunya tendem a ser mais graves em pacientes idosos e com maiores repercussões clínicas, em especial com a presença de sintomas álgicos.

Descritores: Febre de Chikungunya; Idoso; Epidemiologia; Enfermagem em Saúde Pública.

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Introduction

Chikungunya fever had the first confirmed cases in Brazil in Oiapoque city, in September 2014. Chikungunya was a high-impact public health problem registered in Brazil in 2015. Of the 38,332 suspected cases distributed in 696 municipalities, 13,236 (34.5%) were confirmed and, of these, six deaths occurred in people with a mean age of 75 years⁽¹⁻²⁾.

An important feature of the disease is joint pain even after the period of viremia, in the acute phase of the disease. The viremia is characterized by the presence of the virus in the blood and lasts about 5 to 10 days after the onset of symptoms. The symptoms include fever, back pain, arthralgia, and sudden onset of intense headache⁽¹⁾. Joint and muscular pain can last from months to years, and there is no consensus in the literature about the average duration of these conditions. It is estimated that an average of one third of people affected by the disease evolve to the chronic phase, characterized by physical limitation, interference with work routine and with quality of life⁽²⁻³⁾.

Scientific evidence demonstrates that the chronic phase of Chikungunya may be associated with the evolution of inflammatory rheumatic diseases, with premature onset of rheumatoid arthritis and psoriatic arthritis in people already predisposed to these diseases, including the occurrence of more severe and insidious forms⁽⁴⁾. Infection with Chikungunya virus (CHIKV) acts as a predisposing factor to inflammatory processes, which begin soon after the virus is inoculated, favoring the early release of proinflammatory cytokines in various tissues, including muscles and joints⁽⁴⁻⁶⁾.

The clinical repercussions of Chikungunya fever affect especially the elderly. In this age group, greatest attention is placed on the risk of complications due to previous diseases and the higher propensity to lethality due to the low organic and immunological reserve typical of the age, although the disease has low potential lethality in other age groups⁽⁴⁻⁵⁾.

Furthermore, the increase of the Brazilian el-

derly population in recent years has been accompanied by an increase of non-communicable chronic diseases and consequent physical limitations. Chikungunya fever is also considered a trigger of these limitations. The impact of Chikungunya fever on elderly people causes major functional repercussions, requiring more attention and understanding of the implications of the disease in this population⁽⁶⁻⁷⁾.

Health care for elderly patients who present pre-existing diseases and comorbidities and Chikungunya fever is essential for maintaining health and controlling the clinical repercussions of the disease. In this sense, in view of the vulnerability of these patients and the consequences that Chikungunya fever can bring to them, studies about the impacts of the infection on this group, which is apparently one of the most affected, are very important.

From this perspective, the objective of this study was to characterize the clinical and epidemiological aspects of elderly people affected by Chikungunya fever.

Methods

This is a retrospective cross-sectional study with data from the National Notifiable Diseases Surveillance System, of confirmed cases of Chikungunya Fever in the epidemiological surveillance department of the Municipal Health Secretariat of Goiana, Pernambuco, from January 2015 to April 2017. The first cases confirmed by laboratory or clinical epidemiological criteria occurred in the municipality of Goiana in September 2015, and since then there was a growing increase in the number of cases, with the outbreak in 2016.

The study population corresponded to all elderly patients diagnosed with CHIKV infection and whose case was reported in the study municipality. Sample selection was intentional. The inclusion criteria were: reported and confirmed cases of Chikungunya fever in patients aged 60 years and over, with and without associated comorbidities. The exclusion criteria were:

notification forms that presented incomplete records of the variables of interest of the study. There were 3,064 cases confirmed by laboratory criteria in the period selected for the research, of which 522 occurred in elderly people. After checking the abovementioned criteria, the final sample was 300 elderly.

An instrument was created for data collection and served as a script to record the information related to the intended research objectives. The variables considered in this instrument were those that later served to build the database for statistical analysis. The variables corresponded to personal characterization data such as age, gender, race and origin, and clinical characterization data such as presence of associated comorbidities, disease stage at the moment of notification, need for hospitalization and associated signs and symptoms.

Data were double-entered in a spreadsheet (Microsoft Excel®) by the researchers and transferred to the Statistical Package for the Social Sciences, version 25, for analysis. Frequencies and percentages of each variable were calculated in the evaluation of the qualitative variables, and the chi-square (X^2) test was used to compare the proportional distribution of results within each group. Significance was indicated by $p < 0.05$ in all tests.

As a secondary data source was used, Informed Consent Forms were not needed. The research project was approved by the Research Ethics Committee with Certificate of Presentation for Ethical Appraisal n° 66113417,4,0000,5640 and Opinion n° 2,037,142.

Results

The evaluated elderly ($n = 300$) were mostly females, aged 60 to 106 years, with a mean of 70.5 years and a standard deviation of ± 9.36 years. The test for comparison of proportions was significant for all factors evaluated ($p < 0.05$), indicating that the socio-demographic profile of the elderly and the clinical aspects of the disease were the most prevalent in the researched sample. In the characterization of the clinical

profile, most of the elderly reported the disease in the chronic phase, requiring hospitalization, and they had associated comorbidities (Table 1).

Table 1 – Sociodemographic and clinical characterization of elderly people who reported infection with Chikungunya fever

Evaluated factor	n (%)	p*
Age (years)		
60 to 75	220(73.3)	
76 to 90	72(24.0)	< 0.001
≥91	8(2.7)	
Sex		
Male	111(37.0)	< 0.001
Female	189(63.0)	
Origin		
Urban zone	286(95.3)	< 0.001
Rural zone	14(4.7)	
Race		
White	22(7.3)	
Brown	170(56.7)	
Black	106(35.3)	<0.001
Yellow	2(0.7)	
Indigenous	-	
Disease stage		
Acute	128(42.7)	0.011
Chronic	172(57.3)	
Hospitalization		
Yes	224(74.7)	< 0.001
No	76(25.3)	
Comorbidities		
Yes	189(63.0)	< 0.001
No	111(37.0)	

* X^2 test

The most frequently reported comorbidities were hypertension (46.7%), followed by diabetes mellitus (34.0%). P-values were significant for all factors analyzed, indicating a higher proportion for cases with the highest percentage, except for hypertension in relation to the proportion of non-hypertensive patients in which the difference was not significant (Table 2).

Table 2 – Comorbidities presented by elderly people who reported infection with Chikungunya fever

Factor	Yes	No	p*
	n (%)	n (%)	
Diabetes mellitus	102(34.0)	198(66.0)	< 0.001
Hypertension	104(46.7)	160(53.3)	0.248
Hematologic diseases	4(1.3)	296(98.7)	< 0.001
Liver diseases	18(6.0)	282(94.0)	< 0.001
Chronic kidney disease	19(6.3)	281(93.7)	< 0.001
Gastric diseases	38(12.7)	262(87.3)	< 0.001
Autoimmune diseases	2(0.7)	298(99.3)	< 0.001

* X² test

As for signs and symptoms, fever and arthralgia were reported in all cases. There was also a significant number of cases of symptoms of joint pain, such as low back pain 289 (96.3%) and arthralgia 300 (100.0%), despite the considerable percentage of patients reporting absence of joint disease 203 (67.7%). P-values were significant for all factors analyzed, indicating that signs and symptoms occur in a similar way in the elderly (Table 3).

Table 3 – Signs and symptoms presented by elderly people who reported infection with Chikungunya fever

Factor	Yes	No	p*
	n (%)	n (%)	
Fever	300(100.0)	-	< 0.001
Myalgia	34(11.3)	266(88.7)	< 0.001
Headache	294(98.0)	6(2.0)	< 0.001
Rash	199(66.3)	101(33.7)	< 0.001
Vomiting	207(69.0)	93.0(31.0)	< 0.001
Nausea	241(80.3)	59(19.7)	< 0.001
Low back pain	289(96.3)	11(3.7)	< 0.001
Conjunctivitis	3(1.0)	297(99.0)	< 0.001
Arthritis	97(32.3)	203(67.7)	< 0.001
Arthralgia	300.0(100.0)	-	< 0.001
Petechiae	4(1.3)	296(98.7)	< 0.001
Leukopenia	-	300(100.0)	< 0.001
Retro-orbital pain	6(2.0)	294(98.0)	< 0.001
Spontaneous bleeding ("tourniquet test")	-	300(100.0)	< 0.001

* X² test

Discussion

The present study has some limitations, since the cases of Chikungunya fever considered here were only the ones reported, excluding the possible under-reported cases. Reporting of infectious diseases is lower than expected in Brazil. Furthermore, the use of secondary data limits the analysis to the variables available in the notification forms and do not allow exploring other determinant and conditioning factors related to the development of the disease.

However, the study contributed with information that allows health professionals to know the clinical and epidemiological aspects of elderly patients with Chikungunya fever, also in the chronic phase of the disease, and reinforces the need for timely provision of preventive measures, self-care and health services. For nursing professionals, the study can contribute to the planning of care provided to the elderly population, notification of suspected cases, and especially in the assistance provided in primary health care units.

As Chikungunya fever is a disease recently registered in Brazil, with several ongoing studies, the results of this research may contribute to strategic actions to prevent and control exposure to the vector and the occurrence of new cases, and also to alert about the possibility of more severe cases in elderly patients with associated comorbidities, or pre-existing joint disease.

Chikungunya fever is an emerging public health problem, mainly due to the debilitating acute and long-term musculoskeletal manifestations. From this perspective, it is necessary to plan health care according to the unique needs of elderly patients, aiming at their well-being and adopting measures that preserve their autonomy. Independence is an important value for the elderly; becoming dependent on care due to the sequelae of Chikungunya fever can have major physical and emotional consequences in these people⁽⁵⁻⁸⁾.

Promoting healthy coping strategies is a major

challenge. This can be achieved through follow-up at primary health care units and home visits by health teams. Clinical studies show a wide range of clinical manifestations of the disease, and there is no yet a comprehensive consensus on the clinical picture of Chikungunya fever. However, long-term self-perceived sequelae significantly impact quality of life in a considerable proportion of patients. Female gender, advanced age, some comorbidities and severity of the acute phase were associated with persistent arthralgia⁽⁵⁻⁶⁾.

The feminization of old age, characterized by greater participation of females in the elderly population analyzed, was evident in the present study. Older women are the majority in all the world's populations, as they live five to seven years longer than men in the same age group. The frequency of illnesses can still be explained by the fact that women usually stay longer at home, where most infections occur⁽⁹⁾.

Female sex, age above 40 years, joint involvement in the acute phase, previous diagnosis of joint disease and presence of comorbidities such as diabetes mellitus were the factors that were most associated with the disease, both in the acute and in the chronic phase⁽⁵⁻⁶⁾. When planning health care for elderly patients with Chikungunya fever, these aspects should be considered.

The predominance of the variable brown and black race/color leads to a reflection on the social determinants of health. Ethnic/racial factors have been associated with increased health problems in the black/brown population. The permanence of social inequities, such as the maintenance of people in social exclusion, with difficult access to health services, income and work, perpetuates conditions of vulnerability in specific groups, and blacks are often in less favored conditions⁽¹⁰⁾.

Diseases caused by mosquitoes disproportionately affect underprivileged populations in various ways. Living in large urban centers, in places without infrastructure and minimum sanitation conditions, difficulty to access health services, living in conglomerates due to high population density, poor water

supply, and the need to maintain often poorly maintained reservoirs are factors that favor the spread of mosquitoes and diseases in the poorer sections of the population⁽¹¹⁾.

Increased urbanization, migratory movements, and the ability of the virus to adapt to survive, as well as water crises also facilitate egg laying and the development of more vectors, in addition to the fact that the mosquitoes have adapted well to urban reproduction cycles, favoring the increase of cases of the disease⁽¹²⁻¹³⁾. Vector control, health education and mobilization of the population through social movements and health conferences can contribute to the improvement of the conditions that favor the development of vectors. Health professionals need to address these issues in population health care, especially in primary care.

The clinical signs of arboviral infections are varied in humans. They cause flu-like symptoms, with the appearance of high fever (39° to 40°C) and headache, while rash and arthralgia are evidenced by polyarthritides/polyarthralgia and maculopapular rash. Individuals affected by the infection may still present symptoms such as back pain (96.4%), myalgia (11.2%), nausea (80.7%) and vomiting (69.7%)⁽¹⁴⁾.

Joint pain can be severe and accompanied by abrupt fever, and occurs in 100.0% of patients. Arthritis develops progressively in a few days, and occurs in 100.0% of patients⁽¹⁴⁾. This trait was confirmed in the present research, considering that low back pain and arthralgia were relevant compared to other clinical manifestations.

The presence of rash occurs two to five days after the onset of fever in almost half of the patients. The rash is of the maculopapular type, often present in the trunk and extremities, but can also be seen in the facial, palmar and plantar areas⁽⁵⁾. The presence of maculopapular rash was not significant in the group of elderly studied, considering that the literature reports that more than half of the affected individuals present this clinical manifestation⁽¹⁴⁻¹⁵⁾.

The characterization of cases of Chikungunya

fever may contribute to the early identification of suspected cases of the disease for health care actions and vector control procedures, facilitated through educational actions and individual and collective vector control measures. Individuals of any age are susceptible to CHIKV infection; however, it is observed that when elderly people are infected, the disease causes greater damage. This condition is probably due to the depressed immune state and the association with pre-existing diseases⁽¹⁵⁾.

The results of the study showed a larger contingent of elderly in the chronic phase of the disease, but with an equal incidence of the acute and chronic forms. The infection progresses to three phases, namely, the acute, subacute and chronic. The acute phase presents symptoms such as high fever, headache and polyarthralgia, which may progress to the subacute phase, with exacerbation of joint pain⁽¹²⁾. The disease may also evolve to a chronic phase, with the presence of persistent or relapsing polyarthralgia lasting from weeks to years, compromising the life activities of the patients, reducing their productivity and causing important economic impacts on their quality of life⁽¹³⁾.

Some clinical manifestations of the chronic phase may vary according to gender and age. Women are more susceptible to rash, vomiting and oral bleeding. In older patients, joint pain, edema and prolonged fever are more prevalent⁽⁵⁾. These facts were also observed in the results of the studied population. Lethality is higher in Brazil than in the Americas, with severe cases and deaths being present in people with comorbidities and at extreme ages. These factors, added to those presented in this study, highlight the relevance of preventive and health promotion interventions aimed at this population⁽¹⁵⁻¹⁷⁾.

Joint pain without edema or stiffness was associated with a higher likelihood of recovery. Some cases that evolve to atypical forms of the disease, with less frequent or more severe clinical manifestations, appear in around 0.3% of the affected population and are linked to advanced age (> 65 years) and associated comorbidities. The most severe cases are also associa-

ted with previous reports of febrile seizure, diabetes mellitus, bronchial asthma, heart and rheumatologic diseases, and systemic arterial hypertension^(2,15). The population studied meets the above criteria. These elderly people may be vulnerable to the most severe forms of CHIKV infection.

Studies characterizing the clinical and epidemiological aspects of diseases, especially emerging diseases, are essential for the planning of health care actions. In Primary Health Care services, nurses are recognized as professionals capable of promoting comprehensive and humanized care, promoting health education and establishing bonds⁽¹⁶⁾. From this perspective, the results of this study may contribute to epidemiological-based individual and collective care.

Like other chronic diseases, persistent symptoms associated with Chikungunya fever are disabling in terms of activities of daily living and impair the quality of life of older people. Although the literature shows that long-term symptoms associated with Chikungunya are present at all ages and in both sexes, some groups as elderly female patients with underlying comorbidities appear to be at higher risk than others⁽¹⁷⁻¹⁹⁾.

Because Chikungunya fever is a recent circulatory disease that tends to spread to new areas, this disease may become a major cause of chronic discomfort, musculoskeletal pain, arthralgia, chronic fatigue and depression, especially in the elderly population. Health professionals should be prepared to treat people with symptoms of the acute and chronic phase of the disease, adequately addressing their physical, psychological and social needs^(5,17-19).

Conclusion

Cases of CHIKV infection tend to have greater clinical repercussions in the elderly, since most of them had to be hospitalized. The most frequently identified symptoms in this study were fever and arthralgia, followed by headache and low back pain.

Colaborations

Dourado CARO and Souza SRG contributed to the preparation of the project, data analysis, writing, critical review, and approval of the final version of the article. Quirino EMB, Pinho CM and Silva MAS collaborated with the writing, critical review, and approval of the final version. Andrade MS contributed to data analysis, writing, critical review, and approval of the final version of the article.

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