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Reemerging arboviruses: clinical-epidemiological profile of hospitalized elderly patients

Arboviroses reemergentes: perfil clínico-epidemiológico de idosos hospitalizados

Arbovirosis reemergentes: perfil clínico epidemiológico de personas mayores hospitalizadas

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ABSTRACT

Objective: Describe the clinical-epidemiological profile of hospitalized elderly patients with arbovirus. **Method:** A documentary retrospective population-based descriptive study that used a quantitative approach with hospitalized elderly patients diagnosed with arbovirus was conducted in a teaching hospital. Data were collected from medical records and investigation forms. **Results:** Thirty-three elderly patients participated in this study. A prevalence of dengue was observed, with fever, myalgia, and arthralgia. Arterial hypertension and diabetes were the comorbidities. Statistically significant correlations were obtained between arbovirus and schooling, employment situation, marital status, test results, and use of analgesics; and between the site of arthralgia and Chikungunya. **Conclusion:** The results support nursing care to hospitalized elderly patients with arbovirus, allowing the development of a proper and humanized care plan.

DESCRIPTORS

Aged; Dengue; Chikungunya Fever; Geriatric Nursing; Health of the Elderly.

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INTRODUCTION

The world population is aging. According to the 2015 United Nations Population Division report[1], the number of people aged over 60 years is expected to reach 2.1 billion by 2050. This change in the social context involves specific needs of this elderly population. In this context, the health field should be prepared not only for the impact of chronic diseases, which are very common among the elderly, but also for reemerging infections, which have become more popular in the last ten years[2].

Recently, reemergence of mosquito-borne diseases, known as arboviruses, has been observed, such as chikungunya fever and zika fever, in several countries of the Americas. The presence of these viruses in Brazil, a country that is endemic for dengue, is a great challenge to public health, since everyone is susceptible to infections, and no specific antiviral or vaccine is available for prevention[3].

According to the Epidemiological Report issued by the Ministry of Health, in 2017, 88 people had died of dengue and 99 of chikungunya fever in Brazil until September – the latter with higher incidence in the Northeast region. Regarding zika fever, 6,679 cases were reported in 2017[4]. These diseases have similar clinical characteristics, but varied intensity of signs and symptoms, such as: arthralgia, high fever, nausea, diarrhea, vomiting, retro-orbital pain, myalgia, thrombocytopenia, exanthema, among others[5-6].

Chikungunya fever is a cause for concern, since severe arthralgia, present in nearly 100% of the cases, is the most debilitating characteristic for the patient and may become a chronic condition[5]. In the elderly population, it causes loss of function, physical deconditioning, reduced mobility, depression, arthritis, consequently reducing the quality of life[7]. In addition, zika virus infection can lead to the development of the Guillain-Barré syndrome, a disease that involves generalized asthenia and paralysis[8]. It is important to focus on elderly patients because the most severe forms of illnesses affect these individuals[9].

When providing care to patients with arboviruses, nurses, as educators, act on the prevention of disease complications and health promotion to encourage the adoption of better habits by the population at various levels of complexity. Regarding infected patients, nurses act based on a humanized care plan, with nursing diagnoses, goals, and interventions, seeking to restore the patient's health[10].

Despite being widely disseminated, the knowledge of health professionals about the particularities and complications of these arboviruses is still scarce and limited. Therefore, the organization of health services is essential to ensure prompt solutions to a rapid increase in the number of new cases[5]. Considering the above, the objective of this study was to describe the clinical-epidemiological profile of hospitalized elderly patients with arboviruses.

METHOD

Study design

This is a documentary retrospective population-based descriptive study that used a quantitative approach.

Context

This study was conducted at the Medical and Statistical Archive Service (SAME – *Serviço de Arquivo Médico e Estatística*) of a teaching hospital located in the city of João Pessoa, Paraiba, Brazil. The study population consisted of 41 elderly patients who were hospitalized at the Clinic of Infectious-Parasitic Diseases (DIP – *Clínica de Doenças Infecto-Parasitárias*) with a diagnosis of arbovirus (chikungunya fever, dengue and/or zika fever). The study was conducted from January 2015 to December 2016.

The study included medical records available in the SAME of patients aged 60 years or older, of both sexes, who were hospitalized in the DIP, in the period above, and diagnosed with dengue, chikungunya fever and/or zika fever. The medical records were found through investigation and medical forms of the Brazilian Information System for Notifiable Diseases (SINAN – *Sistema de Informação de Agravos de Notificação*), under the coordination of the Epidemiological Surveillance Sector. Patients whose records and investigation forms were not found or who had "nothing on record" in their files were excluded. Because it was not possible to retrieve information from eight elderly patients, the final sample consisted of 33 patients.

Data collection

Data were collected between June and August 2017, using the information found in medical records and investigation forms of patients.

Data processing and analysis

A semi-structured instrument was used to collect data, which referred to the sociodemographic, clinical and epidemiological profile of the participants. A descriptive and exploratory analysis of data was performed to assess the frequency of study variables. Pearson's chi-square test, Fisher's exact test, and Mann-Whitney test were used to associate the results obtained regarding patient profile and arbovirus diagnosis.

Ethical aspects

The ethical aspects that regulate studies directly or indirectly involving human beings, as defined in Resolution no. 466/12 of the National Health Council, were observed. The project was approved by the Research Ethics Committee of Hospital Universitário Lauro Wanderley/UFPB, according to protocol no. 2.118.718 of 2017.

RESULTS

Regarding the sociodemographic data of all 33 participants, 57.6% were male, 57.6% were aged 60-69 years, 42.4% were brown, 39.4% were retired, 54.5% were married, and 93.9% lived in the urban area. Regarding schooling, 30.3% of the participants did not share this information and 21.2% had incomplete elementary education. The patients' origin was unknown for 42.4% of the participants and 33.3% came to the teaching hospital referred by an emergency and urgency service.

Regarding clinical data, 54.5% had a dengue diagnosis, 45.5% had chikungunya fever, 30.3% had classical dengue fever, and 15.2% had dengue with warning signs. As baseline diseases, 69.7% presented systemic arterial hypertension (SAH) and 48.5% had diabetes (Table 1).

Table 1 – Baseline diseases in hospitalized elderly patients with arbovirus – João Pessoa, PB, Brazil, 2017.

Baseline diseases	n	%
Systemic arterial hypertension	23	69.7
Diabetes	16	48.5
Cardiopathy	10	30.3
Hepatopathy	3	9.1
Chronic kidney disease	3	9.1
Respiratory disease	3	9.1
Ophthalmologic disease	3	9.1
Neurological disease	2	6.1
Autoimmune disease	1	3.0
Hematologic disease	1	3.0
None	2	6.1
Nothing on record	2	6.1

Table 2 shows the signs and symptoms, of which the main ones were fever (97%), myalgia (78.8%) and severe arthralgia (75.8%).

Table 2 – Signs and symptoms reported by hospitalized elderly patients with arbovirus – João Pessoa, PB, Brazil, 2017.

Variables	n	%
Signs and symptoms		
Fever	32	97.0
Myalgia	26	78.8
Severe arthritis	25	75.8
Headache	21	63.6
Nausea	14	42.4
Vomiting	14	42.4
Exanthema	13	39.4
Asthenia	9	27.3
Weight loss	9	27.3
Diarrhea	8	24.2
Back pain	6	18.2
Pruritus	5	15.2
Retro-orbital pain	3	9.1
Conjunctivitis	2	6.1
Edema	2	6.1
Chills	1	3.0

In 15.2% of the elderly patients, polyarthralgia was asymmetrical, 15.2% in wrists and knees and 12.1% in hands. Arbovirus was clinically diagnosed. Of those who had chikungunya fever, only 18.2% were submitted to IgM serology for chikungunya, and among those diagnosed with dengue, 15.2% were submitted to IgM serology for dengue. The main changes in the blood count of patients were: thrombocytopenia (66.7%), high C-reactive protein (48.5%) and leukopenia (39.4%). Regarding the hospitalization period, the most prevalent period was up to 7 days (60.6%), and one death was reported in the sample.

When correlating sociodemographic data with the diagnosis of arbovirus, a statistical significance ($p \leq 0.05$) was observed in the variables of schooling, employment situation and marital status (Table 3).

Table 3 – Socio-demographic data and diagnosis of arbovirus in hospitalized elderly patients – João Pessoa, PB, Brazil, 2017.

Variables	Diagnosis / arbovirus				p value
	Dengue		Chikungunya		
	n	%	n	%	
Sex					
Male	12	66.7	7	46.7	0.247*
Female	6	33.3	8	53.3	
Age group					
60 – 69 years	12	66.7	7	46.7	
70 – 79 years	3	16.7	3	20.0	0.240**
80 – 89 years	2	11.1	4	26.7	
≥ 90 years	1	5.6	1	6.7	
Ethnic group					
White	6	33.3	6	40.0	
Brown/mulatto/*caboclo*	7	38.9	7	46.7	0.432*
Black	3	16.7	-	-	
Nothing on record	2	11.1	2	13.3	
Schooling					
Illiterate	5	27.8	-	-	
Incomplete elementary education	5	27.8	2	13.3	
Complete elementary education	1	5.6	1	6.7	0.002**
Complete high school	3	16.7	2	13.3	
Incomplete high school	1	5.6	-	-	
Complete higher education	1	5.6	2	13.3	
Nothing on record	2	11.1	8	53.3	
Employment situation					
Retired	11	61.1	2	13.3	
Pensioner	-	-	1	6.7	0.008*
Employed	5	27.8	2	13.3	
Housewife	1	5.6	3	20.0	
Nothing on record	1	5.6	7	46.7	
Marital status					
Single	-	-	-	-	
Married	13	72.2	5	33.3	0.022*
Widowed	-	-	2	13.3	
Divorced	2	11.1	-	-	
Nothing on record	3	16.7	8	53.3	
Dwelling area					
Urban	16	88.9	15	100.0	0.412*
Rural	1	5.6	-	-	
Nothing on record	1	5.6	-	-	
Origin					
Urgency and emergency service	7	38.9	4	26.7	
Hospital care	5	27.8	2	13.3	0.370*
Residency	-	-	1	6.7	
Nothing on record	6	33.3	8	53.3	
Total	**18**	**100.0**	**15**	**100.0**	

*Pearson's chi-square test; **Mann-Whitney test.

When the characteristics of polyarthralgia were correlated with the diagnosis of arbovirus, a statistical significance was observed only between the site of the symptom (knees) and chikungunya fever. Also, a significant correlation was observed between blood count (high CRP and thrombocytopenia), use of medication (analgesics), and diagnosis of arbovirus (Table 4).

Table 4 – Blood counts, use of medication and diagnosis of arbovirus in hospitalized elderly patients – João Pessoa, PB, Brazil, 2017.

Variables	Diagnosis / arbovirus				p value
	Dengue		Chikungunya		
	n	%	n	%	
Blood count					
Leukopenia	9	50.0	4	26.7	0.172*
Thrombocytopenia	2	11.1	1	6.7	0.658*
High C-reactive protein	12	66.7	4	26.7	0.037**
Thrombocytopenia	15	83.3	7	46.7	0.026*
Reduced red blood cells	-	-	2	13.3	0.199**
Reduced hemoglobin	1	5.6	4	26.7	0.152**
Nothing on record	1	5.6	6	40.0	0.300**
Medications/treatment					
Analgesic drugs	17	94.4	9	60.0	0.030**
Antipyretic drugs	15	83.3	9	60.0	0.239*
Corticosteroid drugs	-	-	1	6.7	0.455**
Nonsteroidal anti-inflammatory drugs	-	-	1	6.7	0.455**
Oral/intravenous hydration	13	72.2	7	46.7	0.135*
Anti-hypertensive drugs	9	50.0	6	40.0	0.566*
Hypoglycemic drug/insulin	7	38.9	3	20.0	0.283**
Nothing on record	1	5.6	6	40.0	0.300**

*Pearson's chi-square test; **Fisher's exact test.

DISCUSSION

Most of the elderly patients admitted to the DIP clinic presented mandatory medical records and/or investigation forms. In the hospital, disease complications are reported through forms filled by SINAN and sent to the Epidemiological Surveillance Hospital Center, and data are forwarded to the Municipal Health Department. The importance of data quantity and quality of these data should be highlighted – the more complete the records, the more effective and incisive the actions will be to solve any issue[11].

Concerning the sociodemographic data, the sample presented a small predominance of male participants, in agreement with a previous study[11]. Most of the elderly patients belonged to the age group of 60-69 years, in agreement with the Brazilian profile of this population[12]. Regarding the dwelling area, almost all participants lived in an urban area, in agreement with a previous study[13]. Intense urbanization, lack of basic sanitation and poor infrastructure expose the population to a greater risk of infection, since they help expand the habitat of vectors in densely populated places[14]. Regarding schooling, incomplete elementary education was predominant among the participants. The importance of schooling is related to prevention strategies to fight vectors, requiring the population to extinguish domestic mosquito breeding sites[15].

Most of the elderly patients were referred to the hospital by an urgency and emergency service. In a study conducted in an emergency unit in João Pessoa, dengue accounted for 92.5% of reports[16]. Acute pain is the main reason for seeking this service, including low back pain, myalgia, headache and knee pain[17], all belonging to the clinical signs of dengue and chikungunya fever. Therefore, patients tend to seek care in such service, since it is an easily accessible unit[16].

Regarding the clinical aspects and the final diagnosis, a small prevalence of classical dengue was observed in agreement with Brazilian studies[13,18]. Dengue is the most prevalent arthropod-borne disease in the world and is a serious public health problem, especially in Brazil. In a study conducted in the same hospital as this study, this infection ranked second in the reports analyzed[11]. It is a disease that is increasingly affecting the elderly people, who present a higher risk of complications and mortality. According to the Ministry of Health, deaths are related to lack of knowledge and attention to warning signs, search for more than one service without proper conduct and insufficient volume replacement[6]. However, despite the higher mortality among patients with dengue, only one death was reported in this study – an elderly man diagnosed with chikungunya fever.

Chikungunya fever was diagnosed in 45.5% of the sample. The literature states that although it is similar to dengue in terms of symptomatology, it can trigger more devastating epidemics due to the greater number of symptomatic cases, longer period of viremia and shorter incubation time of the etiological agent[19]. A prospective study in Puerto Rico, when identifying the etiology of febrile illnesses in 8,996 patients, reported the prevalence of chikungunya virus[20].

In this study, SAH and diabetes were the main baseline diseases of the hospitalized elderly participants, in agreement with other studies[18,21]. Such chronic diseases are the most frequent among the elderly population and, therefore, should be considered in the therapeutic approach to increase the arbovirus treatment efficacy[22]. The presence of comorbidities in patients with arbovirus has been mentioned as a determinant of the disease severity[21-22], since it may favor complications, especially in individuals older than 75 years[20]. In elderly people with diabetes, for example, decompensated diabetes is associated with dehydration, aggravating the patient's clinical situation with acute arbovirus infection. Oral hydration should be started in the waiting room of the health service[6]. Dengue patients may present bleeding due to thrombocytopenia, coagulopathy and vascular alterations[6], which may be caused by SAH. Then, the approach to arbovirus treatment for elderly patients should have rigorous clinical supervision in relation to comorbidities and polypharmacy[22].

Fever, myalgia and arthralgia were the most frequent clinical symptoms during hospitalization. A similar result was found in a study about dengue in India[21] and in a study about chikungunya[23], both conducted with elderly participants. Fever is present in the arboviruses mentioned

above. In dengue, it is the first symptom, followed by headache, asthenia, myalgia and retro-orbital pain[6]. Besides these symptoms, chikungunya fever is characterized by severe and debilitating arthralgia[20]. About polyarthralgia, it was characterized as asymmetrical, mostly affecting wrists, knees and hands. According to the Ministry of Health[5], polyarthralgia was identified in about 90% of the cases of chikungunya fever in the acute phase. In general, it is bilateral and symmetrical, but it can be asymmetric, affecting large and small joints, often the most distal ones.

All patients of the sample were clinically diagnosed and, for confirmation, only 18.2% were submitted to IgM serology for chikungunya and 15.2% to IgM serology for dengue. This reduced number of serology was also observed in other studies[18,24]. Regarding chikungunya fever, in typical cases, the diagnosis should be based on clinical epidemiological criteria, and serology only when required for differential diagnosis[22]. Atypical cases are those in which the intensity of the symptoms is constant or increased, for which serological diagnosis is mandatory[5]. The same applies to dengue, which should only be confirmed through laboratory exams in severe cases[6].

The most frequent changes in laboratory exams were thrombocytopenia, high CRP and leukopenia, in agreement with a previous study[24]. In chikungunya fever, blood counts of patients commonly present leukopenia with lymphopenia (<1,000 cells/mm^3) and high erythrocyte sedimentation rate and CRP[5]. In dengue, thrombocytopenia is the main laboratory characteristic, and it may also include increased hematocrit[6]. Reduction in the number of platelets causes hemorrhage and death in more severe cases of the disease[25].

When associating sociodemographic data with the diagnosis of arbovirus, a statistical significance ($p \leq 0.05$) was observed in the variables of schooling, employment situation, and marital status. Another study found an association between schooling of fewer than 3 years and the incidence of dengue[26]. The literature reports that lower levels of schooling may lead to difficulties in understanding preventive measures against these arboviruses by the population, favoring an increased number of cases[27]. Regarding the employment situation and marital status, a study found that married individuals presented higher levels of knowledge, avoiding the occurrence of dengue by adopting preventive actions[28]. This finding differs from the results found in this study, since most affected participants were married. The same authors also found an association between employed individuals and higher levels of knowledge.

Statistical significance was found between the site of arthralgia (knees) and chikungunya fever. The literature reports arthralgia as the cause of high morbidity rate among patients with chikungunya, as it reduces the productivity and quality of life of the patients[5], with joint pain restricting movements and potentially causing deformities[25].

Statistical significance ($p \leq 0.05$) was also observed in the association between blood count results (high CRP and thrombocytopenia), use of analgesics and diagnosis of arboviruses. The significance between blood count results and diagnosis can be justified due to the prevalence of high CRP and thrombocytopenia in the sample studied. The significant presence of thrombocytopenia in laboratory exams of these elderly patients increases the probability of a catastrophic event: cerebral vascular accident[21].

Concerning the association between analgesic drugs and arbovirus, patients with dengue often use analgesics because of the symptomatology. In chikungunya fever, arthritis and severe pain also involve the use of these drugs; however, it requires attention, especially in the elderly population, who are more susceptible to polypharmacy and complications due to drug interactions[22]. In dengue, bleeding may occur caused by medications like acetylsalicylic acid, anticoagulants, and nonsteroidal anti-inflammatory drugs, among other precipitating factors[6].

In the current scenario of these epidemics, nurses provide care at all levels of health care. In primary care, nurses stand out for their role as educators, emphasizing prevention and promoting health. In specialized care, in the emergency department, for example, they act on risk classification, identifying the degree of impairment. In hospitals, care is provided after the development and implementation of a humanized care plan[10].

In view of the reemergence of these arboviruses, more severe cases occur in vulnerable groups, such as elderly patients. As a priority, administrators and the population should be mobilized in favor of a health system organization, seeking to ensure prompt solutions. In this context, the role of epidemiological surveillance is to recognize the trends of these diseases in order to direct immediate and specific control actions[29-30].

CONCLUSION

Dengue and chikungunya fever were the predominant arboviruses in the sample studied. The patients presented SAH and diabetes as comorbidities. The most frequent symptoms were fever, myalgia, and arthralgia. Thrombocytopenia, high CRP and leukopenia were the most frequent changes in the exams. Statistically significant associations were found between schooling, employment situation, marital status, results of exams, use of analgesics and diagnosis of arboviruses; and between the site of arthralgia and chikungunya.

The future outcomes of these epidemics in the elderly population and their impacts are still an issue to be resolved by scholars over time. However, the field of health should be prepared to provide proper care to these patients. The results of this study support nursing care to elderly people affected by arboviruses, since the knowledge of the clinical profile of this population supports the development of a care plan to meet their needs. This study is expected to encourage further research regarding the topic in question involving the Brazilian elderly population, given the importance of this theme.

Underreported infectious diseases represent a recurrent reality in Brazil. Therefore, the lack of information in medical records and investigation forms was the main limitation of this study.

RESUMO

Objetivo: Descrever o perfil clínico-epidemiológico de idosos hospitalizados com arboviroses. **Método:** Estudo documental, retrospectivo, de base populacional e descritivo, com abordagem quantitativa, realizado com idosos hospitalizados com diagnóstico de arbovirose em um hospital universitário. Os dados foram coletados por meio de consulta aos prontuários e fichas de notificação. **Resultados:** Participaram 33 idosos. Houve prevalência da Dengue, destacando-se a febre, a mialgia e a artralgia. Verificaram-se a Hipertensão Arterial e a Diabetes como comorbidades. Foram evidenciadas associações estatisticamente significativas da arbovirose com a escolaridade, a situação profissional, o estado civil, os resultados de exames e o uso de analgésicos; e entre o local da artralgia e a Chikungunya. **Conclusão:** Os resultados fornecem subsídios para a assistência do enfermeiro aos idosos hospitalizados com arboviroses, permitindo a elaboração de um plano de cuidados adequado e humanizado.

DESCRITORES

Idoso; Dengue; Febre de Chikungunya; Enfermagem Geriátrica; Saúde do Idoso.

RESUMEN

Objetivo: Describir el perfil clínico epidemiológico de personas mayores hospitalizadas con arbovirosis. **Método:** Estudio documental, retrospectivo, de base poblacional y descriptivo, con abordaje cuantitativo, realizado con personas mayores hospitalizadas con diagnóstico de arbovirosis en un hospital universitario. Los datos fueron recogidos mediante consulta a las fichas médicas y de notificación. **Resultados:** Participaron 33 personas mayores. Hubo prevalencia del Dengue, destacándose la fiebre, la mialgia y la artralgia. Se verificaron la Hipertensión Arterial y la Diabetes como comorbilidades. Fueron evidenciadas asociaciones estadísticamente significativas de la arbovirosis con la escolaridad, la situación profesional, el estado civil, los resultados de exámenes y el empleo de analgésicos; y entre el sitio de la artralgia y la Chikungunya. **Conclusión:** Los resultados brindan subsidios para la asistencia del enfermero a las personas mayores hospitalizadas con arbovirosis, permitiendo la elaboración de un plan de cuidados adecuado y humanizado.

DESCRIPTORES

Anciano; Dengue; Fiebre Chikungunya; Enfermería Geriátrica; Salud del Anciano.

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