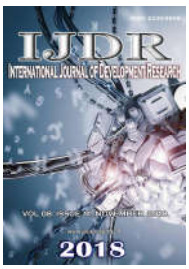
ISSN: 2230-9926

Available online at http://www.journalijdr.com

IJDR

International Journal of Development Research
Vol. 08, Issue, 11, pp. 24089-24091, November, 2018



ORIGINAL RESEARCH ARTICLE OPEN ACCESS

EPIDEMIOLOGICAL PROFILE OF DENGUE IN THE MUNICIPALITY OF AUGUSTINÓPOLIS, STATE OF TOCANTINS, BRAZIL

***Janayna Araújo Viana, Wilian Vaz-Silva and Darlan Tavares Feitosa**

Pontifical Catholic University of Goiás, Goiânia, GO, Brazil

ARTICLE INFO

Article History:
Received 14th August, 2018
Received in revised form
08th September, 2018
Accepted 21st October, 2018
Published online 28th November, 2018

Key Words:
Arbovirus infections, *Aedes aegypti*, Disease Notification, Infectious diseases, Environment.

ABSTRACT

The main objective of this research is to describe the epidemiological characteristics of Dengue in the period from January 2007 to December 2016 and its relationship with environmental aspects in the city of Augustinópolis, State of Tocantins. The research has a descriptive and crosscutting approach of quantitative approach. The sample of this research was composed of all the reported cases of Dengue in the period from January 2007 to December 2016 in the municipality of Augustinópolis, State of Tocantins, provided by the Notification of Injury Information System (SINAN). Regarding the results, 960 cases of Dengue were reported. Therefore, strategies and measures of prevention and control should always be evaluated and (re) modified, since the vector *Aedes aegypti* has high power of adaptation and proliferation according to the environmental and seasonal changes.

Citation: Janayna Araújo Viana, Wilian Vaz-Silva and Darlan Tavares Feitosa, 2018. "Epidemiological profile of dengue in the municipality of augustinópolis, state of tocantins, brazil..", *International Journal of Development Research*, 8, (11), 24089-24091.

INTRODUCTION

Since January 2014, the Ministry of Health has adopted the new classification of cases of Dengue, established by the World Health Organization, and can be presented in the following ways, the first being considered as Dengue; the second defined Dengue with alarm signals and the third characterized form of severe Dengue (World Health Organization, 2017). Currently, Dengue is considered a serious public health problem and has become the arbovirose that affects the population most in the world, especially in tropical countries, where it presents favorable environmental conditions for the development and proliferation of the main mosquito vector, which or Aedes aegypti (Ministry of Health, 2015). The State of Tocantins, being located in the northern region of Brazil and inserted in the areas covered by the Legal Amazon and distribution of the *Aedes aegypti* vector, is now considered an endemic area with imminent risks of outbreaks and/or epidemics. In 2010, 17,294 cases of Dengue were reported. Of these, approximately a little more than half were concentrated in only five of the 139 municipalities of the State (Palmas, Porto Nacional, Paraíso do Tocantins, Araguaína and Colinas do Tocantins). These municipalities constituted a high-risk group of the Dengue epidemic in Tocantins. In addition, it is also known that the disease occurs in the 15 Health Regions of the State and that in almost all the municipalities of Tocantins the Aedes aegypti vector circulates (Valadares, 2013). The municipality of Augustinópolis, for example, is one of the regions of alert in the transmission of these diseases. The objective of this study is to describe the epidemiological characteristics of Dengue in the period from January 2007 to December 2016 and its relationship with environmental aspects in the municipality of Augustinópolis, State of Tocantins. The present research is descriptive and transversal of a quantitative approach. The information concerning Dengue notification data was carried out in the Notification Disease Information System (SINAN Online). The variables collected were all reports of dengue in the period from January 2007 to December 2016. Data were collected in the first half of 2017. Statistical analyzes were performed through the SPSS 23.0 program.

****Corresponding author:*** **Janayna Araújo Viana,**
Pontifical Catholic University of Goiás, Goiânia, GO, Brazil.

RESULTS

Among the 960 reported cases of Dengue in the period from 2007 to 2016, the occurrence of cases was higher in the age

Table 1. The number of Dengue cases according to the reporting health units compared to the demographic and environmental variables considering the total in the periods 2007 to 2016

	Notifying Health Unit n (%)						*p*
	HRAug	USF I	USF II	USF III	USF IV	USF V	
Sex							
Female	147 (47,1)$_a$	87 (57,2)$_{a, b}$	121 (59,3)$_{a, b}$	95 (61,7)$_b$	61 (52,1)$_{a, b}$	10 (47,6)$_{a, b}$	0,023
Male	165 (52,9)$_a$	65 (42,8)$_{a, b}$	83 (40,7)$_{a, b}$	59 (38,3)$_b$	56 (47,9)$_{a, b}$	11 (52,4)$_{a, b}$	
Age group							
< 18 anos	83 (26,6)$_a$	44 (28,9)$_{a, b}$	51 (25,0)$_a$	55 (35,7)$_{a, b}$	44 (37,6)$_{a, b}$	12 (57,1)$_b$	0,004
≥ 18 anos	229 (73,4)$_a$	108 (71,1)$_{a, b}$	153 (75,0)$_a$	99 (64,3)$_{a, b}$	73 (62,4)$_{a, b}$	9 (42,9)$_b$	
Station							
Rainy	252 (80,8)$_a$	131 (86,2)$_a$	180 (88,2)$_a$	125 (81,2)$_a$	97 (82,9)$_a$	15 (71,4)$_a$	0,127
Dry	60 (19,2)$_a$	21 (13,8)$_a$	24 (11,8)$_a$	29 (18,8)$_a$	20 (17,1)$_a$	6 (28,6)$_a$	
Sewer							
Absent	0 (0,0)$_a$	0 (0,0)$_a$	0 (0,0)$_a$	154 (100,0)$_b$	117 (100,0)$_b$	21 (100,0)$_b$	<0,001
Parcial	312 (100,0)$_a$	152 (100,0)$_a$	204 (100,0)$_a$	0 (0,0)$_b$	0 (0,0)$_b$	0 (0,0)$_b$	
Near to reproductive site							
Not	0 (0,0)$_a$	0 (0,0)$_a$	0 (0,0)$_a$	0 (0,0)$_a$	117 (100,0)$_b$	0 (0,0)$_a$	<0,001
Yes	312 (100,0)$_a$	152 (100,0)$_a$	204 (100,0)$_a$	154 (100,0)$_a$	0 (0,0)$_b$	21 (100,0)$_a$	
Proximity of the dump							
Not	0 (0,0)$_a$	0 (0,0)$_a$	0 (0,0)$_a$	154 (100,0)$_b$	117 (100,0)$_b$	21 (100,0)$_b$	<0,001
Yes	312 (100,0)$_a$	152 (100,0)$_a$	204 (100,0)$_a$	0 (0,0)$_b$	0 (0,0)$_b$	0 (0,0)$_b$	
Zone							
Rural	0 (0,0)$_a$	0 (0,0)$_a$	0 (0,0)$_a$	0 (0,0)$_a$	0 (0,0)$_a$	21 (100,0)$_b$	<0,001
Urban	152 (100,0)$_a$	152 (100,0)$_a$	204 (100,0)$_a$	154 (100,0)$_a$	117 (100,0)$_a$	0 (0,0)$_b$	

*Qui-square Post Hoc; Different letters indicate significant differences in the proportions between the columns

range ≥ 18 years in the years 2008, 2009 and 2011. Over the years USF I, USF II, USF III, USF IV and USF V presented statistically significant differences. Thus, to identify the significance between the different health units, the Kruskal-Wallis test was performed, showing a significant difference ($p < 0.001$). The a posteriori test (Qui-square PostHoc) showed that the number of cases of USF II and USF IV was significantly higher than the USF V (Table 1). The average incidence rate of Dengue between the period 2007 to 2016 showed that there were no statistically significant differences over the period. The comparison values of the average incidence rate between the rainy season and the dry season, in this case was significant, indicating that during the rainy season in 2007 and 2011 there was a mean incidence rate significantly higher than in the dry season.

In general, over the years, it can be said that the average incidence in the rainy season was significantly higher ($p = 0.003$) than in the rainy season (2007 to 2016) in relation to the dry season. However, it was found that the standard deviation in the rainy season was very high, indicating that there was a great variation in the incidence rates during this season, indicating that these incidence rates during the rainy season varied considerably, removing the significance when doing the test of Kruskal-Wallis. Thus, in 2016 even in the dry season there were a high number of cases, being specifically in the month of May 2016 an incidence rate of 207, 16 occurred in the dry season. Considering the notifications of the different sexes, there was a statistically significant difference between the reporting health units ($p = 0.023$). The female sex had a higher frequency in the number of cases of Dengue in USF III. The number of cases reported considering the age groups <18 years and ≥ 18 years was also different between the reporting health units ($p = 0.004$), and only USF V presented a lower frequency of notifications for the age group of <18 years and ≥ 18 years. In the areas of the Regional Hospital of Augustinópolis, USF I and USF II, where the sewage was partially present, there were occurrences of all reported cases of Dengue ($p < 0.001$). There was a statistically significant difference also between the reported cases in areas close to reproductive sites ($p < 0.001$), in the vicinity of the dump ($p < 0.001$) and in the area (rural / urban) coverage ($p < 0.001$) notifying party. Regions near the landfill, such as HRAug, USF I and USF II, reported all cases reported for Dengue during the survey period. Proximity to the reproductive site was a factor that was present in most of the reporting unit, except in USF IV. The location in urban areas was predominant in the notifications, except for USF V.

DISCUSSION

Considering the epidemiological data on Dengue in the municipality of Augustinópolis between 2007 and 2016, it is relevant to state that the highest prevalence of this disease was registered in the years 2008, 2012 and 2016. The higher the rates of the number of patients ill and reported by the Unified Health System. Annually, the national campaign to combat Aedes aegypti, known as "D", on December 2, is held by the Ministry of Health, with mobilization in all Brazilian states, in order to raise awareness and mobilize the population to eliminate the sources of mosquito infection in the residences (Ministry of Health, 2017). The research showed that Dengue was a predominant disease in the Urban Zone, from 2007 to 2016, except in 2012, where case reports were significantly higher in the Family Health Unit V, that is, a reference point in health of the rural area of the municipality. Factors such as globalization, increased traffic of people, exodus from the population to the urban area, precipitous and unplanned urbanization, with consequent population increase, concomitant with poor sanitation, inefficient selective waste collection and disposal, and inadequate housing lead to Dengue propagation due to breeding favors and vector dissemination (Fantinati *et al*., 2008; Silva, 2014). The average incidence rate of Dengue in the period from 2007 to 2016, in the Municipality of Augustinópolis did not present statistically significant differences. On the other hand, the mean incidence rate between dry and rainy seasons, revealed that the rainy season was significant over the years, the disease once showed marked fluctuation in the last ten years throughout the months, that is, increased peaks of Dengue fever in the months of January, February and March. However, the standard deviation shows that in the year 2016 in May in the dry season there were high numbers of cases. The Aedes aegypti is considered a highly synanthropic vector, easily

adapted to domestic environments and its surroundings, where they also make blood meals (Pinto Junior, 2016). As a result, many individuals are being infected with the various forms of these arboviruses and suffering serious clinical consequences (Valle, 2016). Dengue in Brazil appears more frequently in the first five months of the year, a hotter and wetter season characteristic of the tropical climate. On the other hand, in the Cerrado the climate differs from the other regions of the country, surveys showed that December and the first three months of the year are more frequent in this region (Coastal, 2016). The rainy season was characterized by the occurrence of a greater number of cases of Dengue. However, in addition to the rains and humidity from the rainy season, there are also other important factors for mosquito proliferation, such as during high temperature and dry season, it is worth noting that Dengue in Brazil also has a typical incidence in the hottest months of the year (Fantinati, 2017). The increasing number of Aedes aegypti during the rainy season is justified due to the high humidity, making the survival of the mosquito longer. However, mosquitoes become more numerous in the dry season, due to the presence of fast and sparse rains, with elevation of temperature. These factors cause alteration in mosquito maturation, causing females to produce smaller mosquitoes, causing them to feed more frequently in blood, in order to obtain a protein source necessary for the maturation of eggs, causing the highest number of people infected by the same female Aedes aegypti (Silva, 2014).

The association of the Health Unit with the environmental variables showed that the Regional Hospital of Augustinópolis, the Family Health Unit I and the Family Health Unit II had 100.0% of the reported cases in areas where the sewage was partially present and also areas near the open dump. However, the Family Health Unit III, IV and V had 100.0% of their cases in areas of absence of sewage and distant from the dump. In addition, all Notifying Health Units except the Family Health Unit IV had their cases reported close to the regions of the reproductive site. The association between age and environmental variables revealed that the high rate of notifications in the age group ≥ 18 years was recorded in areas where sewage was partially present and also in areas near the dump. However, 38.4% of the individuals aged <18 years were reported in regions where sewage was absent in the areas covered by the urban area of the Municipality. However, in rural areas this becomes more pronounced, since the Family Health Unit V was responsible for 57.1% of notifications of <18 years. In addition to these sanitizing characteristics, there is also inadequate accumulation and disposal of garbage or "open dumps", vector resistance to insecticides and lack of a vaccine in the Unified Health System (Fantinati *et al*., 2017; Silva, 2016; Pinto Junior, 2016; Valle, 2016; Coastal, 2016; Cavichioli *et al*., 2016). These factors are not only difficult to control Dengue, but also corroborate other emergent and reemerging diseases, not restricted to environmental and geographic conditions, leading to the emergence of other arboviruses still not well known in the literature, such as Zika and Chikungunya.

Conclusion

The research contributed to know the epidemiological profile of dengue in the city, where it is perceived that over the years the circulation of the virus remains present in the environment of the community under study. It is hoped that this study contributes to better guide the health teams about the behavior of Aedes aegypti in the Municipality, and from that, to awaken in the academic community the interest to carry out other studies about the virus and vector. In addition, it is believed that as of the dissemination of data, managers will begin to plan strategies and adopt more efficient preventive measures in the municipality, in order to reduce the incidence of the pathologies in question, as well as, to provide greater safety and quality of life the population.

REFERENCES

World Health Organization (WHO). Subject: New classification of dengue case - WHO [Internet]. 2014 [quoted 2017 set. 01]. Available at: https://www.policiamilitar.mg.gov.br/conteudoportal/uploadFCK/saude/07022014111200953.pdf

Ministry of Health (BR). Department of Surveillance of Communicable Diseases, Secretariat of Health Surveillance. Chikungunya fever: clinical management. Brasília: Ministry of Health; 2015.

Valadares AF., Carmo-Filho JR., Peluzio JM. 2013. Impact of dengue in two major cities in the state of Tocantins: infestation and environmental factor (2000 to 2010). Epidemiol Serv Health. 22 (1): 59-66. Doi: http://dx.doi.org/10.5123/S1679-49742013000100006

Ministry of Health (BR). Prevention and combat Dengue, Chikungunya and Zika. Brasília: Ministry of Health; 2017.

Fantinati AMM, Santos ACA, Inumaru SS, Valério VTD, Fantinati MS. Epidemiological and demographic profile of dengue cases in the central region of Goiânia - Goiás: from 2008 to March 2013. Tempus [Internet]. 2013 [quoted 2017 Aug. 14]; 7 (2): 107-19 Available at: http://www.tempusactas.unb.br/index.php/tempus/article/view/1347/1150

Silva GM., Andrade AMSS. 2016. Evaluation of the epidemiological profile of dengue in the city of Paripiranga, Bahia, Brazil. Scientia Plena [Internet]. 2014 [quoted nov. 19]; 10 (9), 67-79. Available at: https://www.scientiaplena.org.br/sp/article/view/1894/1036

Pinto Junior VL., Luz K., Parreira R., Ferrinho P. 2016. Zika virus: review for clinicians. Acta Med Port [Internet]. 2015; 28 (6): 760-65. Available at: https://www.minsaude.gov.cv/index.php/documentosite/zika-1/311-virus-zika-revisao-para-clinicos/file

Valle D., Pimenta DN., Aguiar R. 2016. Zika, dengue and chikungunya: challenges and issues. Epidemiol Serv Health.; 25 (2): 419-22. doi: http://dx.doi.org/10.5123/S1679-49742016000200020

Coastal, IMP., Draft DC. Incidence of dengue cases 2007-2013 and seasonal distribution of mosquitoes (Diptera: Culicidae) (2012-2013) in Barreiras, Bahia, Brazil. Epidemiol Serv Health. 2016; 25 (4): 735-44. Doi: http://dx.doi.org/10.5123/s1679-49742016000400007

Cavichioli AAB., Pessoa AM., Almeida RJ., Tavares DF., Reis PRM., Silva-Junior NJ. 2016. Morbimortality of dengue in the area of direct influence of SHP mosquito. EVSPUC-GO, Goiânia. 43 (1): 9-16. Doi: http://dx.doi.org/10.18224/est.v43i1.5195

****