

Original article

The burden of the unspecified febrile syndrome in a community hospital in Cuba

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ABSTRACT

Background: The Cuban health-care system recommends the hospital admissions of patients with unspecified febrile syndrome (UFS) to rule out arboviral diseases and to prevent healthcare associated adverse outcomes. **Aim:** Evaluate the burden of unspecified febrile syndrome in a Cuban hospital. **Methods:** A cross-sectional study was carried out in the Hospital Joaquín Albarrán (La Habana, Cuba) from 1 January 2017 to 31 December 2019. It was collected the admissions and patients days (total and UFS patients) and laboratory test for dengue diagnosis. **Results:** During the three-year period, the epidemic curve starts in April-May and decline in November, with the highest peak in August 2019. It was admitted 16964 patients with UFS representing 43% of the hospital admissions, and 43512 patients' days were documented. In 2019 the 51.9% of the hospital admissions and 22.9% of patients' days were related to UFS, and were performed 7492 IgM test (repeated test in 89 patients) and 46.2% were reactive. **Conclusion:** The hospital admission related to unspecified febrile syndrome constitute a challenge to the organization and the healthcare system to provide the best care for all and minimize its economic impact.

Introduction

In recent decades, the global incidence of dengue has increased dramatically in endemic countries according to the World Health Organization (WHO), from 2.2 cases in 2010 to 96 million cases annually in 2013 [1,2]. Dengue infection is endemic in Cuba with an annual epidemic period mainly during the rainy season

(May – September). In 2017 was reported a co-epidemic of Dengue and Zika with thousands of patients attended over the country [2].

The clinical characteristics of the most frequent arbovirolosis (Dengue, Zika, Chikungunya) are very similar, but they have important differences in the prognosis of the disease and its complications [3,4]. Dengue is characterized by acute fever, severe

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headache, retro-orbital pain, myalgia, arthralgia, a maculopapular rash and minor (e.g. gingival, skin) or mayor hemorrhage (e.g. digestive, hemoptysis) [5,6].

In Cuba the surveillance system for Dengue is focused on patients with acute (less than 7 days) fever of unknown origin, also called unspecified febrile syndrome (UFS). The other clinical findings, already mentioned, could support the diagnosis of dengue that should be confirmed with a laboratory test (IgM detection in serum samples) [5,6].

The Cuban health-care system is public and recommends the admissions of patients with UFS to rule out dengue fever and to prevent any adverse outcomes related to the disease. The system assigns selected secondary care hospitals to the care of adults, children or pregnant with UFS, but these facilities maintain its regular assignment for population care. During the high epidemic period, the healthcare system opens temporary facilities dedicated to the care of patients with UFS.

There are few studies focus on hospital use by patients with UFS. This study aimed to evaluate the burden of unspecified febrile syndrome in a Cuban hospital.

Methods

Study site

The University Hospital "Joaquín Albarrán" is a secondary care 300 beds facility located in La Habana City. It is the main referral center to the adult population of three municipalities (Playa, Lisa, and Mariano) that account for a population of 400000

inhabitants.

Study methods

A cross-sectional study was carried out using the data of hospital admissions from 1 January 2017 to 31 December 2019. It was collected the admissions and patients days (total and UFS patients). The study was conducted according to STROBE guidelines.

The unspecified febrile syndrome is defined as any case referred from a primary care center with acute fever (less than 7 days) of unknown origin that required medical evaluation to rule out an arboviral disease (Dengue and Zika).

The data source was the medical register department (admission, patients' days) of the facility and the 2019 laboratory reports of the serological tests for dengue fever (IgM antibodies determination by UMELISA) performed after the fifth day of the first symptom [7]. The laboratory report is generated by the provincial laboratory of Epidemiology.

The distribution of patients admitted with UFS according to year and monthly during the study period was presented. Also the proportion of admissions with UFS (patients with UFS divided by the total hospital admission expressed by 100 admissions) and the proportion of patients' days (patients days on UFS divided by the total patients' days expressed by 100 patients' days). Descriptive statistics were used for age (mean, standard deviation) and sex and its comparison according to the serology was performed using student t-test and chi-square test. The two-sided statistical

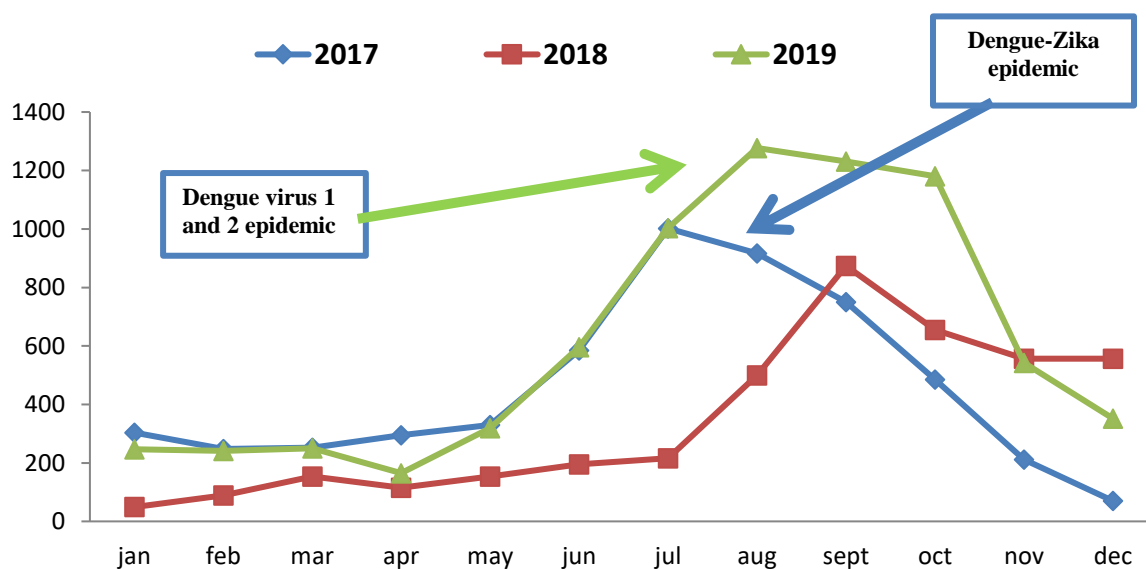
significance level was set at $P < 0.05$.

As the study used administrative data, ethical approval was waived by the institutional review board (IRB).

Results

During 2017 was reported a Dengue-Zika epidemic, during 2018 a Dengue 1 epidemic and in 2019 the simultaneous circulation of Dengue 1 and 2 were reported. During the three-year period, the epidemic curve starts in April-May and decline in November, with the highest peak in August 2019. (Figure 1)

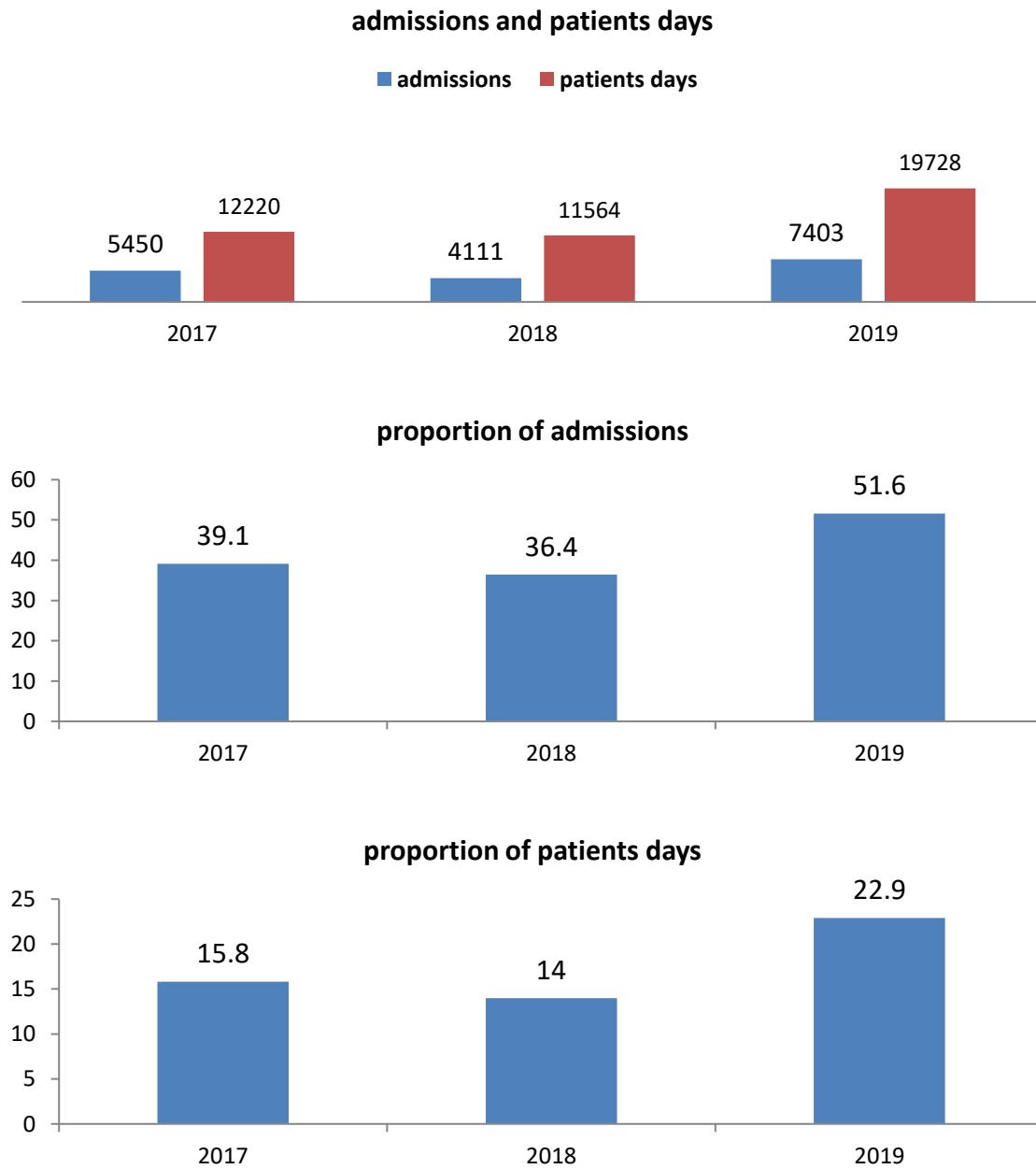
Figure 1. Admission of patients with unspecified febrile syndrome according months (2017-2019)



The admissions and patients days are presented in figure 2. During 2017-2019 were admitted 16964 patients with UFS representing 43% of the hospital admissions. During the study period were admitted

16964 patients and 43512 patients' days were documented with the highest figures in 2019. In 2019 the 51.9% of the hospital admissions and 22.9% of patients' days were related to UFS.

Figure 2. Annual admissions, proportion of hospital admissions (by 100 hospital admissions) and proportion of patients' days (by 100 hospital patients' days) of unspecified febrile syndrome. (2017-2019)



In 2019, were performed 7492 IgM test (repeated test in 89 patients) and 46.2% were reactive. Patients with reactive IgM were older than patients with a non-reactive test (44.9 years vs. 42.4 years) (p =

0.00) and no differences were observed among sex.

(Table 1) The 46% of the IgM were reactive in patients in the 18-29 years old year's group, the 54% in patients among 30-49 years old group and the 58.6% in patients older than 50 years old.

Table 1. Demographic profiles of unspecified febrile syndrome according to serologic results for dengue, 2019

Variables	No	IgM positive		P-value
		No (n=4030)	Yes (n =3462)	
Age (years) *	7492	42.4 (17.0)	44.9 (16.0)	0.00
Sex *				
Female	4123	2187 (53,0%)	1936 (47,0%)	0.15
Male	3369	1843 (54,7%)	1526 (45,3%)	

* Age presented as mean & standard deviation, Sex presented as No. (Percentage)

Discussion

The care of patients with UFS generates a high volume of healthcare for the facility during the period, which is added to the regular care provided to the population. The organization of care is severely stressed because of the need to allocate additional beds and the limited availability of professionals with clinical skills for arboviral care, which constituted critical points to overcome.

The frequency of admission by UFS during 2019 was overwhelming for the hospital's capacity and functioning, especially in beds required, laboratory resources and the medical staff. The internal medicine department has experienced staff in clinical diseases and in the care of arboviral infections. Nevertheless, during the more critical period of the epidemic, the coverage of internal medicine could reach a maximum of 1 specialist by 15 beds with limited support of medical students or physicians from other medical specialties including primary care physicians. Also, it is important to

consider that patients with suspected dengue will require a more frequent evaluation of the early identification of warning signs and the transfer of patients to a proper level of care. Due to this, during night hours doctors are assigned to make rounds to patients, adding this time to their workday.

A key activities related to patient care is the training of medical staff in arboviral disease [3,8]. Thaver et al. evaluate the knowledge, attitudes, and practices of family medicine practitioners about dengue and malaria and identified the needs of training clinical diagnosis and management of endemic vector-borne diseases.⁸ In our setting, the training achieve the highest importance and priority taking into consideration that many physicians related to patients care are non-clinical staff

The hospital has across the year a 36 bed unit for the care of UFS and during the dengue fever epidemic period this capacity is increased, on a step by step basis, to 120 beds. The additional bed capacity came from unused beds and limiting surgical and internal medicine beds. This issue could worsen the beds

available for the care of the other health care problems of the population assigned to the hospital care. The generated bed crisis is related with the care of a population with a heavy burden of chronic conditions (e.g. vascular, cancer) and predominantly elderly. Among the strategies to protect the population the facility gives priority to surgical procedures related to cancer and promotes ambulatory management of selected conditions minimizing the risk of adverse outcomes.

The nursing care for patients with dengue required proper staffing with especial reference for patients with warning signs (bleeding, vomiting, intense abdominal pain, painful hepatomegaly, breathing discomfort, lethargy, others) and regularly the staffing is limited. Also, the nursing staff, in general, is young and has limited experience in the care of UFS patients.

In addition, these epidemics have a definitive impact on healthcare costs [9,10]. Stahl et al describe the cost of dengue outbreaks according to Cuban studies [9]. The average cost per hospitalized dengue case was 296.60 US\$ (2011 data) and the total cost of dengue illness ranged from 10.3 million US\$ in 1997 to 103.2 million US\$ in 1981 [9]. In addition to the medical costs, we consider the impact of non-medical cost [9-11]. Special reference for the detailed cost-related activities, as described by Castro et al [11], including the "transportation, food, lodging, and other costs related to seeking and

obtaining medical care (sick individual and caregiver) and to visiting patients at the hospital (caregiver); travel time; days of school and of work lost (sick individual and caregiver) because of the immediate and long-term consequences of an infection (absenteeism), and others. A recently published paper describes the economic burden from the perspectives of the patients and its family in Cuba, where the average direct non-medical cost related to dengue was 7,95 USD mainly related to transportation and foods. This cost could be high in the capital city (La Habana) by the differences in this issue among the cities.

It is expected that the annual epidemic has a definitive impact on the economic growth of the country. Previous studies had shown a reduction of 0.26% in the average income per capita and a negative linear economic impact on Southern Taiwan's economic growth [12]. The effect of dengue epidemics could be considered more important in low-income countries where the resources are very limited, including the technology for infection prevention (in-hospitals and in primary-care settings) [13].

Our study has several limitations. First, the data was collected in a single-center which could limit data comparison. In La Habana City (Cuba) adult patients with UFS are admitted into six facilities with different bed capacity and source population. Second, the study does not provide information

about patients admitted in critical care units (CCU), although the majority of patients are admitted in wards dedicated to UFS and transfer to the critical unit according to selected criteria. Also, the use of beds in CCU is not presented.

In conclusion, the hospital admission related to unspecified febrile syndrome constitute a challenge to the organization and the healthcare system to provide the best care for all and minimize its economic impact. Research needs that must be addressed include the identification of diseases related to Dengue IgM seronegative patients, the accuracy of the diagnosis of UFS, and the quality improvement actions focus on the rational use of the hospital's facility.

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Competing interests

Non declared

Ethical approval

Waived by the institutional review board

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