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Original Research Article

Dengue Outbreak in Eastern part of the Sri Lanka, Study Conducted in Teaching Hospital Batticaloa, Sri Lanka

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Abstract: Sri Lanka is a south-Asian island of Indian Ocean and situated south-east of the Indian subcontinent. It is in the grip of a severe dengue epidemic. Currently, dengue fever [DF] and dengue hemorrhagic [DHF] fever cases are reported all part of the SriLanka, but we could observe two peaks in absolute number and incidence of DF and DHF occur annually along with monsoon rain and density of two mosquito vector species (*Aedes aegypti* and *Aedes albopictus*).In the eastern part of the SriLanka, there were dengue out break started in January 2017.This study was conducted in the Tertiary care hospital Batticaloa, SriLanka. Objectives of the study were to know the pattern of distribution of DF among male and female and to know the incidence of laboratory confirmed dengue cases among clinically suspected dengue patients. During this last four month period number of suspected dengue fever cases increased steadily, from 1st of January 2017 to 31st of April there were 2562 suspected dengue cases admitted in this hospital. Last four months 1811 dengue-IgM and IgG antibodies tests were carried out, only 760(41.96%) cases were positive for primary infection.

Keywords: Dengue fever, dengue outbreak and SriLanka

INTRODUCTION

Dengue viral fever is the most significant mosquito-borne disease affecting humans, with around 40-50 million cases of dengue fever(DF) and several hundred thousand cases of dengue hemorrhagic fever (DHF) diagnosed globally according to the WHO reports [1]. The disease is spread by the bite of two species of mosquitoes - Aedes aegypti and Aedes albopictus. A study conducted in Srilanka, which revealed that multiple dengue virus serotypes play within the close proximity [2].The virus causing dengue occurs in four different serotypes, DEN-1, DEN- 2, DEN- 3 and DEN- 4. Contracting one form of dengue fever provides lifelong immunity only for that serotype, but not for other serotypes. A person who has already got over an infection from one serotype of the disease contracts another serotype, it is possible that he or she, could go into severe forms of the disease such as DHF or dengue shock syndrome (DSS) [3].

In SriLanka for the first time serologically confirmed dengue case were reported in 1962.In 19th century DF was considered as a sporadic form of disease. It became epidemic in SriLanka after the long travel and its pattern also changed to DHF and DSS[4].The first documented DF outbreak occurred in 1965-1966,with some cases of hemorrhagic disease. Medical institute claimed that there has been a dengue transmission in 1970 and 1980 without significant numbers of DHF/DSS. SriLanka experienced first epidemic of DHF/DSS caused by DEN-3 type in 1989-1990.DF/DHF become a notifiable disease since 1996 in Sri lanka [5].

Prevalence of mosquito-borne dengue is terrifyingly rising in SriLanka. According to the Ministry of Health; over 43,000 cases of dengue have been reported from January to early part of May of 2017.East part of the Sri Lanka is not escaped from the dengue. According to the epidemiology unit report, this revealed that in 2016 only 612 dengue cases were reported in Batticaloa district. But in 2017, more than 2000 dengue cases were reported in the first four month periods [3].

MATERIAL AND METHODS

This was a record-based descriptive study conducted in the Teaching hospital Batticaloa; Sri Lanka from 1st January to 30th April 2017. It is the one of the largest hospital in the east part of the Sri Lanka. With the permission from the hospital director, almost all suspected dengue fever data was retrieved from the hospital records. We collected nearly 2562 suspected dengue fever cases including adult and pediatric

populations. Our analysis mainly concentrated on adult population; out of total dengue suspect 1585 were adult population. We also collected number of details of dengue antibody test which was performed during these periods.

RESULTS

During this last four month period numbers of suspected dengue fever cases were increased steadily. From 1st of January 2017 to 31st of April there were 2562 suspected dengue cases admitted in this hospital (Table-1). But, only 501 cases were reported in 2016.Compared with 2016, in 2017 increased number of dengue cases was reported. This increased number was statistically significant ($p<0.01$) .Out of 2562 suspected DF cases 1585(61.86%) were adult population, only 977(38.13%) cases were pediatric population (Chart-1). In adult population, proportion of male(61%) cases were higher than the females(38.99%).Last four months of 2017,nearly 1811 dengue-IgM and IgG antibodies tests were carried out, only 760(41.96%) cases were positive for primary infection and 1051(58.04%) were negative for primary infection, whereas 855(47.21%) cases had dengue-IgG antibodies positive(secondary dengue infection).

DISCUSSION

Dengue fever has been in SriLanka since 1962.However, it was not a major health threat to the public. But, dengue fever started to become epidemic and dramatically increased since 2010 [5].Dengue fever was also reported in other parts including Africa, America, Eastern Mediterranean, Western pacific and south east Asia. The worldwide incidence of dengue has been raised by 30 fold [6].

The World Health Organization (WHO) estimates that 50–100 million dengue infections occur each year and that almost half of the world's population lives in countries where dengue is endemic. Compared with other diseases and their respective burdens, dengue can cause as much or greater suffering than other communicable diseases in some of the most affected regions [6].Rapid changes of urbanization and increasing population growth have lead to the current global dengue pandemic [2].

Table-1: Dengue cases reported in 7-years periods in Batticaloa district

Year	January	February	march	April	Total
2017	**306**	**479**	**746**	**1031**	**2562**
2016	124	65	34	31	254
2015	335	347	210	124	1016
2014	43	66	147	92	348
2013	52	74	93	67	286
2012	263	116	91	32	502
2011	31	41	104	185	361

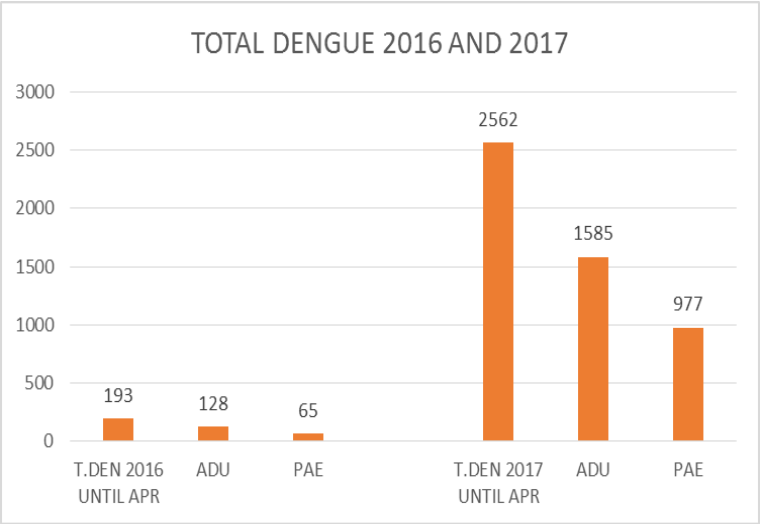

Chart -1 Indicate total dengue fever cases, dengue cases in adult population and pediatric population reported in Teaching hospital Batticaloa, Srilanka in 2016 and first four months of 2017.

During this outbreak from January 1st to April 30th in 2017, 2562 dengue fever suspects were reported, out of that 1585(61.86%) were adult population. In our study, majority of dengue infection occurred in males (61%). A preliminary dengue study conducted in SriLanka, where males (66.1%) were more

affected than females (33.8%) [7]. Similar study conducted among the adult population in India by Jimmy Antony which exposed that males dengue victims (60%) higher than the females (39.29%) [8].This male predominant pattern was seen in our study as well. There were number of seronegative and seropositive dengue fever cases reported in Teaching hospital Batticaloa. In 2017, during the first four months nearly 1791 dengue IgM and IgG antibody test were done in our institution, this amount is five times higher than the test done in first four month of 2016.Interestingly, 760(42.43%) tests were positive for Dengue IgM antibody, it indicates primary dengue viral infection.Seropositivity of IgM antibody test highly positive when we do test after 5th day of fever. A study conducted in Indonesia, which revealed that IgM antibodies were positive in 7.9% of patients who came to the clinics on day two, 20.2% on day three, 36.7% on day four and 48.8% on day five or more[9].We usually sent blood sample for antibody test after 5th day of fever and in our centre positive dengue-IgM antibody test was 42.43% which is more or less near to the Indonesian study. Another study conducted in India, where dengue IgM antibody positive nearly 17% [10].

We also analyzed the prevalence of secondary dengue infection by detecting dengue-IgG antibody test. We have collected 1791 results of dengue-IgG antibody tests from 1st January to 30th April in 2017.Out of that 855(47.73%) cases were evidence of secondary dengue infection [positive for IgG-antibody].Secondary dengue infection is more severe than primary dengue infection [11,12].

The reason for large number of DF cases in the Batticaloa district in 2017 can be related to abnormal climates, in the means of unexpected heavy rain and huge amount of infrastructure development may contribute to mosquito breeding grounds in our area.

CONCLUSION

We reported our experience of the dengue fever outbreak in 2017.Despite the intensive national programs conducted to eliminate dengue mosquito breeding grounds all over the island and the prevailing climate changes, the mosquito-borne disease is reaching epidemic levels. Dengue epidemics continue to be a serious public health problem in many areas of the world. Disease control remains a challenge in the absence of an effective vaccine and specific therapies.

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