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MICROBIOLOGICAL PROFILE OF DENGUE CASES REPORTED AT GOVERNMENT GENERAL HOSPITAL, SIDDIPET .

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ABSTRACT :

Introduction: Dengue fever, a mosquito-borne disease that occurs in tropical and subtropical areas of the world, is considered to be a significant threat for the mankind in both developing and developed countries.It causes a wide spectrum of illness from mild asymptomatic illness to severe fatal dengue hemorrhagic fever/dengue shock syndrome. Its impact today is thirty times >50 years ago. Global incidence of dengue has drastically upped in the last few years. Materials and Methods: The study was carried out in the department of microbiology at Government general hospital,siddipet fpr a period of one year , that is from January 2019 to December 20219. Blood was collected from each patient suspected to be suffering from dengue, at least 3 days after onset of fever. Serum was tested for the presence of dengue NS1 antigen and antihuman IgM antibodies using Panbio Dengue Early enzyme-linked immunosorbent assay (ELISA) kit and National Institute of Virology. Results: A total of samples

2251 were tested over a period of one years i.e. from January 2019 to December 2019. Out of which 592 (26.29%) were sero-positive for dengue with symptoms of classical dengue fever. IgM in 349(58.9%) NS1- 243 (41.04%). Conclusion: As vaccines or antiviral drugs are not available for dengue viruses, the only effective way to prevent dengue is to control the mosquito vector, Aedes aegypti and prevent its bite.

Keywords: Dengue, IgM Antibody, Dengue Early enzyme-linked immunosorbent assay, Flaviviridae

Introduction :

Dengue is a disease of many tropic and subtropics regions that can occur epidemically; caused by dengue virus, a member of the family Flaviviride. Dengue is transmitted in humans by two species of Aedes mosquitoes namely, Aedes aegypti and Aedes albopictus. There are four

distinct serotypes of dengue virus which can all cause a spectrum of disease, ranging from asymptomatic infection to the most severe form of the disease Dengue Hemorrhagic Fever (DHF). The symptoms of dengue infection are high fever, severe headache, painful joints and muscles, vomiting, nausea, pain behind the eyes and skin rashes. These symptoms almost last for about one week, but weakness and tiredness may last for several weeks. In some patient's dengue fever leads to development of DHF and the patient may reflect problems including blood in the urine or stool, bleeding gums or bloody nose. These symptoms may lead to death if untreated[1]. Dengue fever, also known as break bone fever, is an infectious mosquito-borne disease which is caused by the dengue virus and occurs in tropical and subtropical areas of the world. The dengue virus belongs to the Flaviviridae family of viruses that cause diseases in human. Dengue is a self-limiting disease that clears up by it usually within a couple of weeks. The incubation period for dengue is five to eight days[2] . Researchers are working on dengue fever vaccines, but the best prevention for now is to reduce mosquito habitat in areas where dengue fever is common [3]. Dengue infection in a previously non-immune host produces a primary response of antibodies characterized by a slow and low-titer antibody response. IgM antibody is the first immunoglobulin isotype to appear. In a suspected case of dengue, the presence of anti-dengue IgM antibody suggests recent infection. Antidengue IgM detection using enzyme-linked immunosorbent assay (ELISA) represents one of the most important advances and has become an invaluable tool for routine dengue diagnosis. Specifically, MAC ELISA (IgM antibody capture ELISA) diagnosis is based on detecting dengue-specific IgM [4].

Materials and Methods :

The study was carried out in the department of Microbiology at Government general hospital, Siddipet, for a period of one year , i.e. from January 2019 to December 20219. Fever cases of all age groups and either sex was included as per the following inclusion criteria .

Inclusion criteria:

All age groups with fever and other features suggestive of Dengue fever according to WHO criteria (headache, retro orbital pain, myalgia/arthralgia, rash, haemorrhagic manifestations, thrombocytopenia and leukopenia).

Exclusion criteria :

- Those with other viral fevers with thrombocytopenia
- Those with positive for Malaria parasite (All species).
- Those with acute and chronic liver disease.
- Those with blood dyscrasias.

For the detection of dengue-specific IgM antibodies, blood was collected from each patient suspected to be suffering from dengue, at least 5 days after onset of fever and age and sex of each patient were recorded. An informed consent was obtained from all patients who met the inclusion criteria.

Sample collection: The blood was allowed to clot at room temperature (20°C–25°C) and then centrifuged at 3300 rpm for 10 min. If not tested within 2 days, the separated serum was transferred to a sterile vial and stored frozen at -70 °C.

Enzyme-linked immunosorbent assay:

Serum was tested for the presence of dengue NS1 antigen and antihuman IgM antibodies using Panbio Dengue Early enzyme-linked immunosorbent assay (ELISA) kit (Standard Diagnostics, Inc., Republic Korea) and National Institute of Virology (NIV) DEN IgM capture ELISA kit supplied by NIV, Pune, respectively, by ELISA as per the manufacturer's protocol. The Panbio Dengue Early ELISA is a dengue NS1 antigen capture Elisa. It is for qualitative detection of NS1 Ag in human serum.

Statistical analysis:

Based on age, patients were divided into five groups. Normally distributed continuous variables were summarized by mean and standard deviation. Remaining variables were summarized as median (interquartile range). All categorical variables were summarized as percentages. For data analysis, statistical software SPSS Statistics 24.0was used

Result :

A total of 2251 samples were tested over a period of one year i.e. from January 2019 – December 2019. Out of which 592 (26.29%) were seropositive for dengue with symptoms of classical dengue fever. IgM was found in 349 (58.9%) and NS1 – 243 (41.04 %) (Table 2). A male preponderance was observed (359, 60.8%) while females (233, 39.2%) (Table 3). Maximum number of cases were reported in postmonsoon season September (39.9%, 900) and October (610, 27.0 %) (Table 4). The predominant age group affected were children in the age group of 6-12 years. Fever was the most common presenting symptom (70.49%,) followed by body pains and rash.

Table 1

Total samples tested	Positives	Negatives
2251	592	1659

Table 2:

Total IgM Tested samples	IgM Positives	Total NS1 antigen tested	NS1 Positives
1173	349	1078	243

Table 3:

Total Dengue positives	Number of Male positives	Number of female positives
592	359	233

Table 4:

Month	IgM Elisa Tests done	IgM Elisa Positives	IgM Elisa Negatives	NS1 antigen Elisa Tests done	NS1 antigen Positives	NS1 antigen Negative	Total tests done (IgM +NS1)	Total Positives (IgM +NS1)
JANUARY	-	-	-	22	-	22	22	nill
FEBRUARY	-	-	-	17	-	17	17	nill
MARCH	-	-	-	18	-	18	18	nill
APRIL	-	-	-	29	-	29	29	nill
MAY	-	-	-	15	-	15	15	nill
JUNE	-	-	-	26	-	26	26	nill
JULY	18	2	16	12	3	9	30	5
AUGUST	-	-	-	202	58	144	202	58
SEPTEMBER	488	165	323	412	102	310	900	267
OCTOBER	285	76	209	325	80	245	610	156
NOVEMBER	296	80	216	-	-	-	296	80
DECEMBER	86	26	60	-	-	-	86	26
Total	**1173**	**349**	**824**	**1078**	**243**	**835**	**2251**	**592**

Discussion :

Dengue is emerging as a major public health problem in India. India witnessed widespread dengue fever outbreaks. According to published reports, all four serotypes of the dengue virus are cocirculating in India [8]. Among 2251 cases tested 349 (58.9%) were found to be positive for IgM antibodies to dengue by IgM capture. ELISA method. In present study the ratio of positive cases among the males and females was 1.4:1. Similar results were found in studies conducted by Ira shah et al (48.44%), S.L. Hoti et al (50.6%), B. Mustafa MEH et al (36.9%) respectively [9,10,11]. In this study Ns1Ag test was positive 41.04% cases, Similar observation were seen in study by B. Mustafa MEH et al (31.2%) [5]. In the present study there was a strong correlation present between NS1Ag positivity and Dengue hemorrhagic fever and dengue shock syndrome complications. Mean age of presentation reported by different authors are as followsIra Shah et al - 6.1 years [9], Hoti et al 1-15 years [10], Raju BJ and Rajaram G -0-10 age group [6]. In the present study also most of the reported cases were from the age group of 1-15 years. The majority of the cases were reported during the monsoon and post monsoon seasons, in accordance with the reported patterns of dengue transmission[7].

In the present study the most common clinical presentation along with fever were pain abdomen, vomiting, arthralgia, body pains, poor intake facial puffiness and abdominal distention. Similar observations were made in study conducted by Neeraja et al, Gurdeep et al, Manjith Narayana et al, Agarwal et al[(8-11)]. In the present study, the frequency of dengue fever was found to be 50.49% which correlates with the reports of Parida et al and Raja et al. have reported a higher

frequency of dengue fever (64.10% and 46.84%, respectively [12,13]while Bandyopadhyay et al (25.6%), Patankar et al (21%) and Chakravarti et al (31.1%) [14,16].

The complex epidemiology of dengue fever in the Indian subcontinent has substantially changed over the past six decades regarding prevalent strains, affected geographical locations and severity of disease. The upward trend is due to increase in long-distance travel, population growth and urbanisation, lack of sanitation, ineffective mosquito control and increases in the surveillance and official reporting of dengue cases. The limitations of the study were we could not do the serotyping to know the prevalent strain.

Conclusion:

As, during epidemic and non-epidemic years, dengue infections are mostly seen in post monsoon season, hence preventive measures should be in full swing at the very onset of the monsoons. Dengue cases appear mostly in the post-monsoon period.

Hence, the appropriate preventive measure should be initiated during the monsoon season only. In the absence of a licensed vaccine or specific drugs, the containment of spread of the vector and the disease is still important.

What the study adds to the existing knowledge?

The present study aims to highlight the epidemiology of dengue at a tertiary care hospital in Telangana, India.

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