



AN EPIDEMIOLOGICAL STUDY ON DENGUE VIRAL FEVER AND ITS CORRELATE BETWEEN THROMBOCYTOPENIA AND LEUKOCYTOPENIA IN DENGUE MARKERS AT RURAL POPULATION IN JAIPUR, RAJASTHAN.

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ABSTRACT

Background: Dengue or dengue fever is one of the most important mosquito-borne viral disease in worldwide distribution. The virus is the member of flavivirus group which typically is a single stranded RNA virus.

Methods: This study was conducted on September 2019 to December 2019 and specimens which were received blood samples in the Microbiology lab for detection of dengue Through card method, we used the DAY1 kit by J Mitra and DENGUE DUO by SD company which is detected dengue NS1, IgM and IgG antibodies, from patients with clinical suspicion of dengue fever-like illness, who presented to the outpatient's department and indoor patients were admitted NIMS hospital Jaipur, Rajasthan.

Results: Among 1222 patients is dengue suspected and diagnosed as 390 dengue positive patients. Which is dengue Ns1 383 (95.2%), IgM 18 (4.3%) and IgG 2 (0.5%). And according to male and female as well as 294 (75.4%) & 96 (24.6%). Then age group wise more predominant 11-20 years 30.8%. Most predominant thrombocytopenia is according to platelet count less than 50000 / microliter (25.6%) were patients. Among leukocytopenia is 48.7% is dengue fever patients.

Conclusions: Present study concludes that clinical surveillance about dengue haemorrhagic fever is important as timely recognition can influence outcome and may prevent any complications.

KEYWORDS : Dengue, Thrombocytopenia, Leukocytopenia

INTRODUCTION

Dengue is the most important arthropod-borne viral infection of humans. Globally, an estimated 2.5 billion people are at risk of Dengue, and approximately 975 million of these lives in urban areas of the tropical and sub-tropical countries of southeast Asia, the Pacific and the Americas¹. Every year, 50-100 million cases occur, hospitalizations for the infection have reached 5 lacks and the global death toll is >2 lacks persons².

Dengue virus is belonging to the Flaviviridae family and it is maintained in nature primarily through biological transmission between susceptible vertebrate hosts by hematophagous arthropods³.

The dengue virus has antigenically four distinct serotypes which are called DEN-1, DEN-2, DEN-3, and DEN-4. Each serotype of the virus produces a specific, lifelong immunity, but it provides only a short-term cross-immunity⁴.

Dengue fever results in a wide spectrum of clinical manifestations ranging from asymptomatic or mild illness to severe dengue haemorrhagic fever (DHF) dengue shock syndrome (DSS) which is characterized by hemodynamic disturbances, increased vascular permeability, hypovolemia, hypotension, and shock⁵.

Thrombocytopenia and platelet dysfunction are common in both cases and are related to the clinical outcome⁶. Thrombocytopenia is one of the diagnostic criteria of DHF and DSS⁷. Though the dengue virus-induced bone marrow suppression decreased platelet synthesis, an immune mechanism of thrombocytopenia caused by increased platelet destruction appears to be operative in patients with DHF⁸. The study in India, thrombocytopenia was found in 71% of dengue cases⁹.

The first Dengue virus reported case of illness in India was in Madras in 1780, the first virologically proved epidemic of DF in India occurred in Calcutta and Eastern Coast of India in 1963-1964. According to NVBDCP, cases are increasing from 99913 in 2015, 129166 in 2016 to 157220 in 2017. Its distribution varies from state to state. In Rajasthan, dengue cases doubled within 2 years from 4043 in 2015 to 8387 in 2017¹⁰.

The main haematological abnormalities in dengue are thrombocytopenia and leukopenia¹¹.

Thrombocytopenia is often symptomatic demanding platelet transfusion. As there is an inherent risk associated with platelet transfusion, it is imperative to define precise criteria and transfusion trigger for platelets in dengue patients¹².

MATERIAL AND METHODS

This study was conducted on September 2019 to December 2019 and specimens which were received blood samples in the Microbiology lab for detection of dengue Through card method, we used the DAY1 kit by J Mitra and DENGUE DUO by SD company which is detected dengue NS1, IgM and IgG antibodies, from patients with clinical suspicion of dengue fever-like illness, who presented to the outpatient's department and indoor patients were admitted NIMS hospital Jaipur, Rajasthan.

Card Procedure:-

In dengue serology card test dengue NS1 antigen card well drop 1-2 drops of patients serum or plasma and wait for 20 minutes there was a control line pink-red colour produce then the results are negative, if there is control and test produce 2 lines pink-red then results is dengue NS1 is positive means the patients have suffering to dengue NS1, In dengue IgM & IgG antibody test perform 10 microliter serum or plasma and one drop of buffer of dengue IgM & IgG antibody, wait for 20 minutes and produce a control line pink-red then results is negative when produce control and IgM or IgG then positive of the test of patients.

In thrombocytopenia and leukocytopenia is observed of the help of cell counters Horiba and Sysmex k21 and also confirmed by the manual method of white blood cell counts and Platelets counts.

In our study, there was no statistically significant correlation between leukopenia and complications rate in patients with dengue with thrombocytopenia

RESULTS:-

From September 2019 to December 2019, we found suspected patients of dengue are 1222 and dengue positive patients 390 while NS1 positive 383, IgM patients 18 and 02 patients IgG. A total of 832 patients don't have dengue fever. Out of total 31.9% Dengue positive patients and 68.1 % Dengue negative patients respectively (fig 1.)

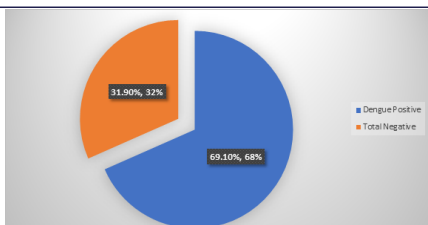


Fig no.: -1. Distribution of Dengue positive and negative.

A total of 390 dengue positive patients which is dengue Ns 1, IgM& IgG positive i.e. 383(95.2%), 18(4.3%) and 02(0.5%) respectively (fig2).



Fig no.: -2. Distribution of NS1, IgM and IgG antibody in patient's serum sample.

In dengue patients 296 Male and 94 Female, we distribute age wise patients like <10 age, <20, <30, <40, <50 and >51. We found 237 patients > 18 old age, and percent of 61.8 % patients Men, 70 Female (18.2%), children 76 (20%) (Table no.1).

Table no 1. Age wise distribution and number of total positive patients and percentages.

Age in Years	Number of patients	Male	Female
1-10	21 (5.4 %)	12(3.1%)	9 (2.3%)
11-20	150 (38.5 %)	120 (30.8%)	30 (7.7%)
21-30	126 (32.3 %)	108 (27.7%)	18 (4.6%)
31-40	44 (11.3 %)	27 (6.9%)	17 (4.4%)
41-50	24 (6.2 %)	14(3.6%)	10 (2.5%)
>51	25 (6.3 %)	13(3.3%)	12 (3.1%)
Total	390 (100%)	294(75.4%)	96(24.6%)

Describe Thrombocytopenia less than 20000 / microliter platelets count, number of patients in our study 40 (10.2 %), like distribution, less than 50000/ microliter, number of patients 100 (25.6 %), <100000/ microliter, number of patients 80 (20.5 %), < 150000/ microliter, number of patients 59 (15.2 %) and normal platelet count were 111 patients (28.5%)(fig 3).

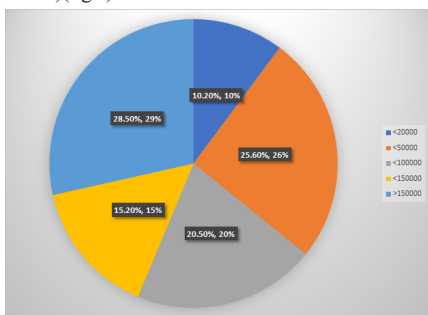


Fig no.: -3. Distribution of Thrombocytopenia in various platelet counts.

Describe Leukocytopenia we found <4000/ml, patients 190 and percentages 48.7%, >4000/ml, 200 patients and percentages 51.3%(fig 4).

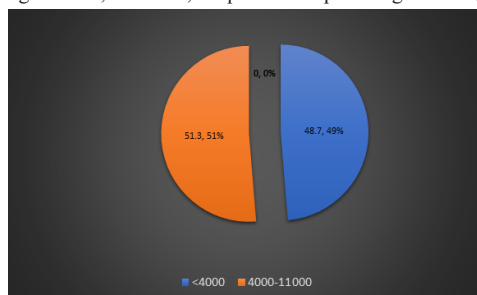


Fig no.4. Distribution of Leukocytopenia.

DISCUSSION

Dengue is the most important, an emerging disease of the tropical and subtropical regions today. It has been known to be endemic in India for over two centuries, as a benign and a self-limited disease. To analyze the seroprevalence of dengue specific antibodies from patients with clinically suspected dengue fever or dengue hemorrhagic fever¹³.

In our study, 71.5 % have Thrombocytopenia less than 150000 / microliter in Dengue cases. Our study is compared to Khan DM KK *et.al.* (2014), thrombocytopenia was found in 71% of dengue cases⁹.

In our study dengue patients have Leukocytopenia 190 (48.7%) and normal white blood cells 200 (51.3%). Our observation similar to Prathyusha *et al* (2013) in her study at Eluru showed that with increasing severity of leukopenia there is increased the incidence of hemorrhagic manifestation¹⁴.

A total dengue suspected patient 1222 which is dengue positive patients 390 (31.9%) and dengue Negative patients 832 (69.1%). Our study compared to Ukey PM *et. al.* 2010, central India reported 31.3% of patients to be serologically positive for dengue infection¹⁵.

In our study total positive male patients 294 (75.4%), while 96 (24.6%) female patients. This result is compared to M, Chatterjee *et.al.* (2008) in this study males' patients (61%) were more commonly affected like a report from 2006 in New Delhi¹⁶.

In our study Out of 1222 suspected patients of dengue and 390 patients of dengue positive which is dengue NS1 383 (95.20%), IgM antibody 18 (4.30%) and IgG antibodies 02 (0.5%). Similar observations find out Kumar S *et al.*, at Bikaner¹⁷.

CONCLUSION

This study shows a significant prevalence of dengue infection between dengue suspected patients and it hence reflects that dengue is fast emerging as a major health problem in rural Rajasthan. I coupled with general awareness among the public and constant observation by healthcare officials is needed in combating dengue. Further studies are required to map out the prevalence of different sero types and genotypes of dengue viruses in Rajasthan, so as to forecast any future outbreak of DHF in the state.

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