

STUDY OF DENGUE OUTBREAK IN NORTHWEST ZONE OF RAJASTHAN

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ABSTRACT

Background: Dengue is one of the most important mosquito-borne viral disease globally. The virus is the member of flavivirus group which typically is a single stranded RNA virus. It is 2nd most common arthropod borne disease in India. Due to its atypical presentation often dengue missed out as a differential diagnosis. High clinical suspicion and proper investigation help in early diagnosis of Dengue and its complications. **Methods:** A total of 200 patients were selected to be a part of study after applying inclusion and exclusion criteria. Only those patients were included in the study who had classical features of dengue- fever with chills, body ache, headache and thrombocytopenia and had a positive serology against dengue virus. Patients who had malaria, enteric fever, and negative serology were excluded from the study. Other causes of pancreatitis, pneumonitis, ascitis, cholangitis, pleural effusion and thrombocytopenia are rolled out. All patients were subjected to a detailed history and a thorough clinical examination. A complete blood count, liver function tests, renal function tests, chest X-ray and USG abdomen were also done. **Result:** Among 200 patient diagnosed as dengue fever, 110 were male and 90 female, majority were from 16-30 year age group. Average duration of stay in hospital is 4.2 days. Along with fever and malaise, nausea and vomiting, headache, pain abdomen, bleeding diathesis, itching, cough were the major complaints in decreasing order. Different findings in the investigations are Mean WBC counts – 4210, mean platelet counts – 28900, mean hematocrit – 44.4, mean MPV- 9.55, no. Of patient with deranged ALT/AST(2 times)- 102(51%). In USG ascitis, pleural effusion and edematous gall bladder were the major findings followed by hepatomegaly and splenomegaly. No. of patient required platelet transfusion were 72. Among these 72 patients average no. of RDP transfused is 2.2 units. **Conclusion:** Our study concludes that clinical vigilance about various type of presentations is important as timely recognition can influence outcome and may prevent compliations.

KEYWORDS: Dengue is one of the most important mosquito-borne viral disease globally.

INTRODUCTION

Dengue is one of the most important mosquito-borne viral disease that has become major health problem worldwide especially in tropical countries like India. The dengue virus, a member of the genus *Flavivirus* of the family *Flaviviridae*, is an arthropode-borne virus that includes four different serotypes (DEN-1, DEN-2, DEN-3, and DEN-4).^[1] Dengue virus is a positive-stranded encapsulated RNA virus and is composed of three structural protein genes, which encode the nucleocapsid or core (C) protein, a membrane-associated (M) protein, an enveloped (E) glycoprotein and seven non-structural (NS) proteins. It is transmitted mainly by *Aedes aegypti* mosquito and also by *Ae. albopictus*. The first reported case of dengue like 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 2years from 4043 in 2015 to 8490 till 1 August 2018.^[2] This trend has become a cause of concern for the country. Every year during the monsoon months and later, many parts of the country witness outbreaks of dengue infection. Dengue virus infection presents with a diverse clinical picture that ranges from asymptomatic illness to DF to the severe illness of dengue hemorrhagic fever/dengue shock syndrome (DHF/DSS).^[3] Patients may presents like pain abdomen bleeding diathisis like rash, hematuria, respiratory symptoms. Four main characteristic manifestations of dengue illness are (i) continuous high fever lasting 2-7 days; (ii) haemorrhagic tendency as shown by a positive tourniquet test, petechiae or epistaxis; (iii) thrombocytopenia (platelet count $<100 \times 10^9/l$); and (iv) evidence of plasma leakage manifested by haemoconcentration (an increase in haematocrit 20% above average for age, sex and

population), pleural effusion and ascites, *etc.* Dengue virus infection exhibit varied clinical presentation, hence, accurate diagnosis is difficult and relies on laboratory confirmation. The condition is usually self-limiting and antiviral therapy is not currently available. Supportive care with analgesics, hydration with fluid replacement, and sufficient bed rest forms the preferred management strategy.

METHODS

Study site

This study was conducted as a hospital based observational study at Sardar Patel Medical College, a tertiary care centre in north-west region of Rajasthan. A total of 200 patients were selected to be a part of study after applying inclusion and exclusion criteria. These were patients who were admitted to Medicine wards at SP Medical College from August 2018 to December 2018.

Study design

Its a observational study conducted in tertiary care centre during the period August – December 2018, for study of different aspects of Dengue. A total of 200 patients were selected to be a part of study after applying inclusion and exclusion criteria. Only those patients were included in the study who had classical features of dengue- fever with chills, body ache, headache, rash, bleeding manifestations and thrombocytopenia and had a positive serology test i.e. NS1, IgM, IgG antibodies against dengue virus. Patients who had malaria, enteric fever and patient with negative serology were excluded from the study. Other causes of pancreatitis, pleural effusion, cholangitis, ascitis were ruled out. All patients were subjected to a detailed history and a thorough clinical examination. A complete blood count, liver function tests, renal function tests, chest X-ray and USG abdomen were also done.

Serological test

The rapid detection of Dengue infection was performed by commercially available kits. The kit provides two windows, one detection of NS1 antigen and other for dengue specific IgM and IgG antibodies. All tests in this study were carried out in accordance with the manufacturer's instructions and results were examined and interpreted accordingly; the blood sample of individuals containing IgM or/and NS1 were considered as primary/acute dengue infection, i.e. they were infected by DENV for the first time. The tests indicating IgG + IgM/ NS1 were considered as secondary infection, i.e. such patient was already infected by dengue in past. If the individual was detected positive for IgG but negative for other tests (IgM and NS1), were considered as past infection or secondary DENV infection with symptoms. The presence color line (control) in each result window indicates a negative result. NS1 antigen is found from the first day and up to 9 days after onset of fever in sample of primary or secondary dengue infected patients. Usually IgM does not become detectable until 5–10 days

after the onset of illness in cases of primary dengue infection and until 4–5 days after onset of illness in secondary infections. In primary infections, IgG appear the 14th day and persist for life. Secondary infections show that IgG rise within 1–2 days after the onset of symptoms and induce IgM response after 20 days of infection (as per SD Bioline Dengue Kit manual).

Statistical analysis

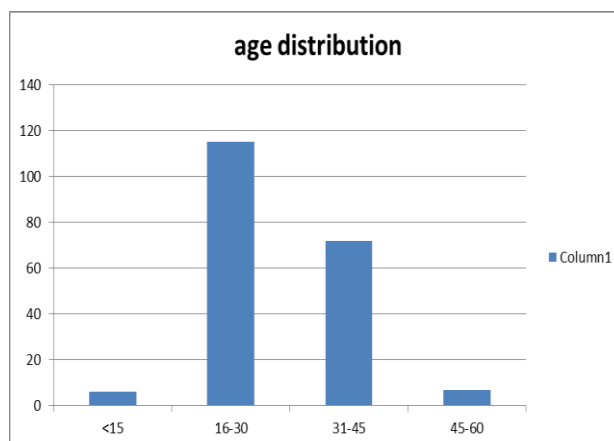
The data was entered in Excel 2007 and SPSS software package (version 20) was used for statistical analysis. Group comparison for prevalence of IgG and IgM and other clinical symptoms was done using ANOVA.

RESULTS

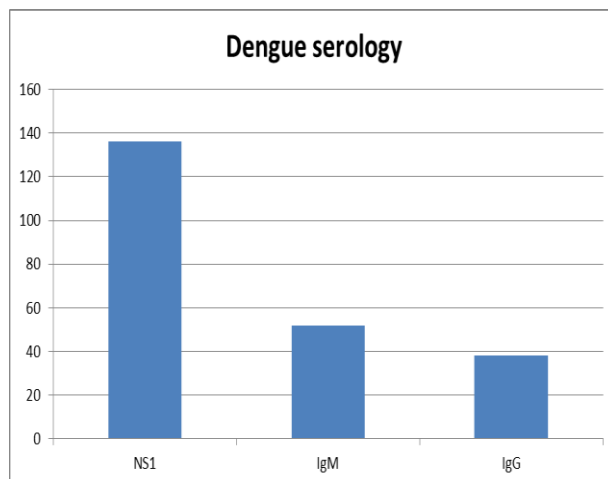
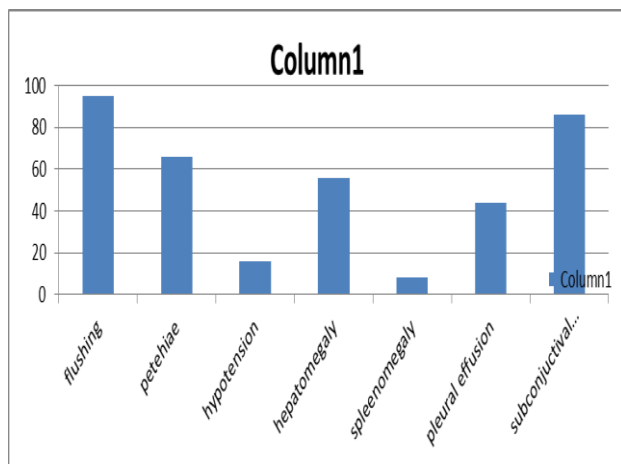
In our study 110 were male and 90 female.

- As shown in table 1, which shows age wise distribution of patients. Most of the patients belong to age group 16-30 year second most 31-45 years. It indicates dengue is more prevalent in adult age group.

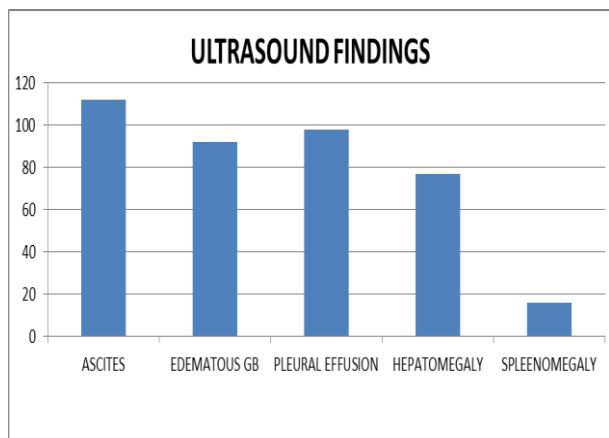
Male	110
Female	90



- Table no 3 shows the symptoms at the time of admission. According to it majority of patients presented with fever and malaise followed by nausea and vomiting, headache, sore throat, pain abdomen, bleeding diathesis. Hematuria and hematemesis were seen in few patients only.



- Mean duration of hospital stay was 4.2 days.
- No. of patient required platelet transfusion – 72
Among these 72 patients mean no of RDP transfused -2.2 unit.
- Different findings in the investigations
 - Mean WBC counts – 4.21 thousand
 - Mean platelet counts – 28.9 thousand
 - Mean hematocret – 44.4
 - Mean MPV- 9.55
 - No. Of patient with deranged ALT/AST- 102
- Table no 4 shows the different USG findings in dengue patients. Majority of patients had ascitis (112), pleural effusion (98), edematous gall bladder (92), hepatomegaly (77) and splenomegaly (16) as USG findings in decreasing order. Very few patients had rare findings like panretitis(5).



- Table no 5 shows serological finding in dengue patients. According to it majority of patients came positive in NS1 (136), followed by IgM (52) and IgG (30).

DISCUSSION

In our study we found 110 males and 90 females were affected, and most of them were in the age group of 16-30. Similar observations made by kumar S et al at Bikaner in 2017.^[4]

We found 80 (40%) cases presented with acute abdomen which was more than observation made by Shabbir et al in 2012 who reported acute abdomen presentation in 32% of the cases.^[5] Acute abdominal pain presentation was found only in 4.15% of the cases in a study done by Weerakoon in Sri Lanka in 2009.^[6] Thus we are observing changing clinical pattern of dengue fever similar to other illness like malaria. High percentage of acute abdomen presentation in our study may also be because our hospital is tertiary care referral hospital therefore serious patients come to our institution or it may also be due to change in virulence of dengue virus.

In the study done by Kumar S et al at Bangalore, Karnataka, India, a total of 100 patients of dengue fever were studied, out of which 70 patients had elevated AST levels and 73 had elevated ALT level while in our study out of 200 patients 102 patients (51%) had elevated AST and ALT. Fever followed by nausea and vomiting was the most common symptoms at presentation followed by headache and pain abdomen which in early stage suggested hepatic dysfunction. 38.5% of the patients had hepatomegaly, 8% of patients had splenomegaly with or without hepatomegaly. In ultrasonographic examination Ascites was most common finding (56%) followed by Pleural effusion (49%) and edematous Gall Bladder (46%). AST and ALT were statistically higher in these patients and in those developing complications like DHF, DSS, hepatic failure, ARDS, ARF and encephalopathy.^[7]

In the study done by Vaibhav Shukla, Ashok Chandra at Era's Lucknow Medical College it was shown that the average platelet count was 35,000.^[8]

In our study we found average platelet count is 28,922.

In the study done by Asim A et al in Lahore, Pakistan in 2014 where he had divided the patient having elevated liver enzymes into three groups i.e. mild (two-fold increase in LFT), moderate (3-4 fold increase in LFT) and severe (greater than 4 fold increase in LFT) based on the degree of elevation of the liver enzymes.^[9]

Kunal G et al showed that 85% of the patients had an elevated AST level. ALT levels were raised in 73% of the patients, 32 of whom mild, 30 had moderate and 11 had severe elevation of the enzyme.^[10]

In our study we found 51% patient had deranged AST/ALT levels out of which 37% had mild 27% had moderate and 36% had severe elevation of liver enzymes.

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