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## CLINICO-EPIDEMIOLOGICAL STUDY OF DENGUE IN A TERTIARY CARE HOSPITAL OF WEST BENGAL, INDIA

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### ABSTRACT

**Background:** Dengue fever is one of the world's important viral hemorrhagic fevers, most geographically widespread of the arthropod-borne virus illnesses, caused by Arbo virus of Flavi-virus genus with 4 serotypes. A large population live in dengue-risk regions with about millions new cases each year worldwide. West Bengal has been experiencing the problem of dengue outbreak since long. Dengue Infection can present as a very diverse presentation. This study was done to study the clinical and epidemiological profile of dengue in a tertiary care hospital of Kolkata.

**Methods:** A retrospective study was conducted at School of Tropical Medicine, Kolkata on consecutive 100 serologically diagnosed dengue cases admitted from 1st August 2016 to 31st October 2016. The serological diagnosis was done using Rapid Immunochromatographic Card Test (RICT) in the Virology laboratory of the hospital. Detection of at least one component (NS1, IgM or IgG) was considered to be positive for sero-diagnosis. A pre-designed Proforma was used to collect information from the hospital records.

**Results:** Majority of cases 52% were of Dengue fever (DF) according to WHO classification. Male (59%) preponderance was noted among the cases. Fever was the presenting symptom in all cases followed by vomiting (61%) and headache (49%). Hepatomegaly seen in 31% cases and hepatitis was seen in 27% cases. The mean platelet count was lower than normal values in all the cases.

**Conclusion:** Detection of large number of cases in a short duration signifies high incidence rate. Dengue should be suspected in all cases presenting with symptoms like fever, vomiting, headache and even in diarrhoea. Rash may not be present, as seen in classical dengue fever. DF is more common than dengue haemorrhagic fever (DHF) and dengue shock syndrome (DSS). The use of Dengue RICT helps in the prompt and early diagnosis and management of the case and prevent complications of the dengue. Altered liver function is very usual for dengue fever and sometimes it is used to prognosticate the course of illness. But precise indicator for complication is not yet available.

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### INTRODUCTION

Dengue fever is the most common of all arthropod diseases and has emerged as a major public health problem in recent years. Dengue should be suspected in all patient presented with fever, headache and vomiting. Dengue fever is more common than Dengue hemorrhagic fever or Dengue shock syndrome. The use of Dengue RICT helps in the prompt and early diagnosis and management of the case and prevent complications of the dengue<sup>1</sup>. Dengue fever is caused by Arbo virus of Flavi-virus genus with 4 serotypes. It is transmitted by *Aedes aegypti* and *Aedes albopictus* mosquitoes. Four spectra of illness are seen; an asymptomatic phase, acute febrile illness, classic Dengue fever (DF) (with or without hemorrhagic manifestation), Dengue Hemorrhagic Fever (DHF) which includes Dengue Shock Syndrome (DSS)

and Expanded Dengue Syndrome<sup>2</sup>. Clinically Dengue fever is suspected when acute febrile illness of 2-7 days presents with two or more than two of the following, headache, retro orbital pain, myalgia, arthralgia, rash, haemorrhagic manifestations<sup>3</sup>. Dengue haemorrhagic fever is diagnosed when a case with clinical criteria of dengue fever presents with haemorrhagic tendencies evidenced by one or more of the following, a) positive tourniquet test b) petechiae, ecchymoses or purpura c) bleeding from mucosa, gastrointestinal tract, injection sites or other sites plus thrombocytopenia (<100 000 cells per cmm) plus Evidence of plasma leakage due to increased vascular permeability, manifested by one or more of the following: 1) A rise in average haematocrit for age and sex > 20%, 2) A more than 20% drop in haematocrit following volume replacement treatment compared to baseline, 3) Signs of plasma leakage (pleural effusion, ascites, hypoproteinemia)<sup>3</sup>. Dengue shock

syndrome is diagnosed when all the above criteria for DHF is met with evidence of circulatory failure manifested by rapid and weak pulse and narrow pulse pressure (<20 mmHg) or hypotension for age, cold and clammy skin and restlessness<sup>3</sup>. Today, about 2.5 billion people live in areas where there is a risk of dengue transmission<sup>1</sup>. In India, the first confirmed case reports of dengue dates back in the year 1940. Since then many cases have been reported from various states. (Ashwinikumar *et al.*, 2010) As of 2012 statistics by NVBDCP, 50,222 cases have been reported out of which 242 cases died. The highest number of cases was reported from Tamil Nadu (25.5%)<sup>4</sup>.

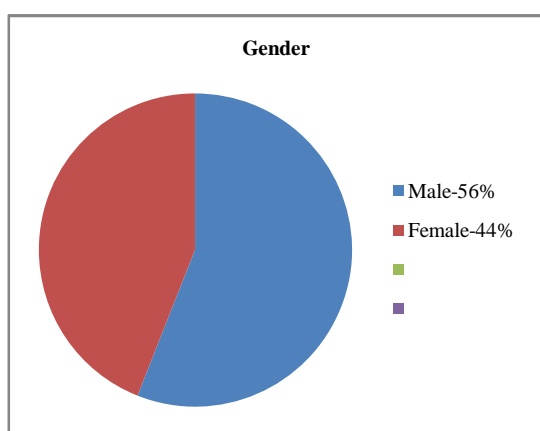
West Bengal has been experiencing the problem of dengue outbreak since long. In this study we will try to diagnose the dengue fever promptly by keeping mind the unusual symptoms and by some rapid diagnostic tests, so that we can prevent complications. As this region is endemic to dengue, this study was conducted to know the profile of dengue cases in this area with respect to socio-demographic and clinical profile of dengue cases admitted in the hospital and also the outcome of these cases.

## MATERIALS AND METHODS

This is a retrospective study was conducted at School of Tropical Medicine, Kolkata on consecutive 100 serologically diagnosed dengue cases admitted from 1<sup>st</sup> August 2016 to 31<sup>st</sup> October 2016. The serological diagnosis was done using Rapid Immunochromatographic Card Test (RICT) in the Virology laboratory of the hospital. Detection of at least one component (NS1, IgM or IgG) was considered to be positive for serodiagnosis. A pre-designed Proforma was used to collect information from the hospital records. By using the proforma which included sociodemographic and clinical manifestations at the time of admission, general physical and systemic examination and biochemical profile data were collected from hospital records of total of 100 serologically diagnosed cases. Standard statistical methods was used for data analysis.

## RESULTS

In the present study age of the patient range from 10- 80 years with mean 30.71. Most of the patients were in 2<sup>nd</sup> and 3<sup>rd</sup> decade of life. Most of the patient were male with male: female (1.27:1).



Majority of cases 52% were of Dengue fever (DF), 37% were of DHF and 11% were of DSS according to WHO classification.

**Table 1.** Distribution of Dengue cases according to WHO classification

Diagnosis	Number	Percentage
Dengue fever	52	52%
DHF	37	37%
DSS	11	11%
Total	100	100%

All the patients were from 6 districts (Kolkata, North 24 Parganas, South 24 Parganas, Howrah, Hoogly and Burdwan) but majority (60%) of patients were from Kolkata. Fever was the presenting symptom in all cases followed by vomiting (61%) and headache (49%). 48% of the cases presented with bleeding manifestations like gum bleeding, petechiae, subconjunctival hemorrhage, menorrhagia, hematuria and melaena. Hepatomegaly was seen in 31% cases and hepatitis was seen in 27% cases.

**Table 2** Distribution of clinical manifestations

Clinical manifestations	Number	Percentage
Fever	100	100%
Vomiting	61	61%
Headache	49	49%
Abdominal pain	23	23%
Hepatomegaly	31	31%
Hepatitis	27	27%
Myalgia	46	46%
Bleeding manifestations	48	48%
Generalised weakness	44	44%
Cough	22	22%
Rashes	38	38%
Diarrhea	5	5%

The mean platelet count was lower than normal values in all the cases. Lowest mean platelet count was found to be in DSS cases (10000/cu.mm). 99% cases were treated successfully and discharged. Only one patient died who had comorbidities DM and HTN and had intracerebral hemorrhage.

## DISCUSSION

In India, the first epidemic of clinical dengue-like illness was recorded in Chennai in 1780 and the first virologically proved epidemic of dengue fever (DF) occurred in Kolkata and Eastern Coast of India in 1963- 1964<sup>5</sup>. The number of dengue cases is on the rise every year. The trend of epidemic and case fatality in India as well as in West Bengal started declining since 2010 outbreak with a total affected of 879 with the advent of vector control strategy by NVPDCP, early diagnosis and prompt treatment<sup>6</sup>. All the 100 serologically diagnosed cases were classified according to WHO criteria into DF, DHF or DSS. The diagnosis was done by using a Dengue RICT. The RICT detects NS1 antigen and IgM and IgG antibodies against dengue. Detection of any one is concerned to be positive test and the patient can be diagnosed as serologically positive case of dengue. (Pramiladeviet *et al.*, 2013; Selvaraj Stephen *et al.*, 2014) Here we included all the 100 serologically positive cases of dengue. Among these 52 cases were of DF, 37 were of DHF and 11 were of DSS. These findings are slightly different from the study conducted in Karnataka in 2015<sup>1</sup>. In their study DHF and DSS were seen in 32% and 2% cases respectively, which were quite high in our study. National Vector Borne Disease Control Program statistics showed a total of 21 dengue related deaths in Karnataka in 2012 (<http://nvbdcp.gov.in/den-cd.html>). But in our study only one death occurred, which was probably due to the other comorbid conditions. Early diagnosis of dengue and prompt management of the cases play the key role in the good outcome of the patients and also in preventing

the complications. This study highlights the burden of dengue in and around Kolkata. It gives an impact on the epidemiology, clinical manifestations and outcome of the disease. The limitations of our study were that it was of short duration and we used Dengue RICT for confirmation. But easy and quick results provided by RICTs helps in the early diagnosis and management of the cases which was the most important.

## CONCLUSION

Detection of large number of cases in a short duration signifies high incidence rate. Dengue should be suspected in all cases presenting with symptoms like fever, vomiting, headache and even in diarrhoea. Rash may not be present, as seen in classical dengue fever. DF is more common than dengue haemorrhagic fever (DHF) and dengue shock syndrome (DSS). The use of Dengue RICT helps in the prompt and early diagnosis and management of the case and prevent complications of the dengue. Altered liver function is very usual for dengue fever and sometimes it is used to prognosticate the course of illness. But precise indicator for complication is not yet available.

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