



Clinical profile of dengue fever presented in tertiary care hospital in north Bengal

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Abstract

In recent years the dengue has spread rapidly to several regions and became a major public health issue globally.

Dengue has become a major public health challenge among vector borne disease in West Bengal but luckily proportionate mortality is less. We designed our study of confirmed Dengue cases with reference to clinical characteristics and various laboratory and other investigations presenting to the Department of Medicine, NBMC, Darjeeling district, West Bengal. Our study is an institution based observational descriptive study with cross sectional design and was conducted in the Department of General Medicine (Indoor patients) of North Bengal Medical College and Hospital, located near Siliguri town of Darjeeling district of West Bengal. Necessary data for the study were collected from May, 2019 to June, 2020.

Headache, myalgia and nausea/vomiting were the most common presented history along with fever. Leucopenia was present among 41.6% of the patients and

thrombocytopenia was observed among more than half of the subjects. Liver enzymes were altered among almost half of the study participants.

Keywords: WHO, DHF, DSS, Dengue,

Introduction

Dengue fever is a viral disease caused by dengue virus. It is transmitted by Aedes mosquitoes. In recent years the dengue has spread rapidly to several regions and became a major public health issue globally. World Health Organization (WHO) in 2012, classified dengue as the ‘most important mosquito-borne viral disease in the world’. Approximate 50 million to 200 million dengue infections, 500,000 episodes of severe dengue (DHF/DSS), and over 20,000 dengue related deaths occurred annually.² In INDIA Dengue is endemic in 35 states/UTs. During 2017, about 157,996 cases were reported with 253 deaths. The case fatality rate was 0.16 per cent. The highest numbers of cases were reported from Tamil Nadu followed by Kerala, Karnataka, Punjab and West Bengal.

Dengue fever is still a recurrent problem in West Bengal.

There was a major outbreak in 2012 involving several districts of West Bengal. That year, West Bengal was second to Tamil Nadu in recording the maximum number of dengue infections and the highest numbers of dengue positive cases (382) were recorded in Kolkata.⁴ An outbreak of dengue fever was reported in Siliguri town, Darjeeling district from October to November 2005 during which most of the cases were dengue fevers without hemorrhagic manifestation. This outbreak in Siliguri occurred during monsoon, which is similar to most of the outbreak occurred in India⁴.

Environmental factors such as temperature and rainfall influences dengue transmission strongly. It is estimated that 52% of the global population at the risk of contracting Dengue fever (DF) or dengue hemorrhagic fever (DHF) lives in the South East Asian Region¹.

As the disease spreads to new geographical areas, the frequency of the outbreaks has increased. Epidemiology of the disease is also changing rapidly. Every year, during the period of July - November, an upsurge in the cases of dengue has been observed in India. The disease has a seasonal pattern and it peaks after monsoon. The risk of dengue has increased recently due to changes in lifestyle, rapid urbanization, and increasing water storage practices in urban, peri-urban, and rural areas lead to proliferation of breeding sites of mosquito. The population growth and high vector to human contact have greater chances of dengue transmission³. Other main reasons for increased transmission risk of dengue include globalization; land use and land cover changes, changes in human behavior and social practices, frequent international travel, lack of adequate medical treatment facilities and climate change⁴. Climatic variables such as rainfall, temperature and humidity play a significant role in dengue “epidemiological triangle” which consists of

virus, vector and host. By 2080, 1.5 to 3.5 billion people worldwide would face the risk of dengue fever due to climate change; infection according to Intergovernmental Panel on Climate Change^{5,6}. Environmental factors influences vector density and distribution strongly. The spatial distribution of vectors also affects the epidemiology of dengue.

Latest reports suggest that the dengue is rapidly spreading to new areas which may be due to introduction of Aedes mosquitoes by shipping, importation of dengue virus through viremic travellers^{7,8}. Other than these, eco-climatic factors are also highly conducive for development of both virus and vector. The effect of temperature on ectotherms including mosquitoes is mainly predictable from fundamental metabolic and ecological processes⁹. The temperature influences the mosquito hatching rate at different life stages, development time, biting rate, mosquito survival and mortality rates. It also fastens the replication of dengue virus in the mosquito thus increases the dengue virus transmission potential to humans¹⁰. Similarly, precipitation increases the vector density by creating new breeding habitats also humidity influences the longevity of mosquitoes^{11,12}.

Dengue viruses have four serotypes and are included in Flaviviridae family¹³. Usually, infection with any of the four serotypes leads to a mild self-limiting febrile illness (Dengue fever).

Dengue Hemorrhagic Fever (DHF) and Dengue Shock Syndrome (DSS) are more severe form disease and are responsible for a higher mortality rate¹⁴. At present there is no specific treatment for dengue. There is also no licensed vaccine for dengue in India. So, prevention of the infection by preventing mosquito breeding and man mosquito contact are important measures to control the disease.

Objectives

1. To understand the clinical profile of dengue cases at North Bengal Medical College and Hospital, Darjeeling district, West Bengal
2. To determine the various laboratory and other investigations of the cases.

Methods

An institution based observational descriptive study with cross sectional design was conducted in the Department of General Medicine (admitted patients) of North Bengal Medical College and Hospital, located near Siliguri town of Darjeeling district of West Bengal. It is the largest health care facility in North Bengal region of West Bengal serving as a tertiary referral institute covering more than six districts of the state of West Bengal and three neighbourhood nations Nepal, Bhutan and Bangladesh. Permission was taken from the respective concerned authority before starting our study. Necessary data for the study were collected from May, 2019 to June, 2020. The study population were all the cases of dengue fever confirmed by testing positive with IgM MAC ELISA for Dengue attending the Medicine Department of North Bengal Medical College, Darjeeling district during the study period. The study inclusion criteria were age more than 12 years, fever for less than 2 weeks. Concomitant infection with other agents like malaria, typhoid, Chikunguniya, Japanese B encephalitis, Scrub typhus and Leptospirosis etc. and Co-morbidities likely to contribute to organ system pathology like poorly controlled Diabetes mellitus (DM2), Hypertension (HTN), chronic kidney disease (CKD) and Chronic Liver disease (CLD) etc. were excluded from the study. After applying the inclusion and exclusion criteria 173 patients presented with dengue confirmed by testing positive with IgM MAC ELISA for Dengue attending the Medicine Department, NBMC, Darjeeling district of West Bengal

during the study period were approached and enrolled in this study. The study variables were clinical profile and lab parameters.

Results

A. Clinical profile

- Majority of the patients presented with headache (83.2%). (Table 1)
- 13.3% of the patients had rashes at presentation (Table 2)
- 35.3% of the patients experienced retro-orbital pain and majority of the patients had myalgia (74%).
- More than half of the patients had complained of nausea/vomiting (53.8%) and 15% of the patients had abdominal pain.
- 7.5% of the patients developed bleeding manifestations. (Table 3)
- The mean (SD) and median (IQR) pulse rate among males were 87.75 (12.20) beats/min and 88 (78, 96) beats/min, and among females were 85.53 (12.33) and 88 (76, 96) beats/min. These differences in pulse rate among males and females were not statistically significant on independent t test (p value -0.26).
- The mean (SD) and median (IQR) systolic blood pressure among males were 118.46 (14.70) mmHg and 120 (110, 129) mmHg, and among females were 117.31 (11.87) mmHg and 120 (110, 126) mmHg.
- The mean (SD) and median (IQR) diastolic blood pressure among males were 75.74 (10.40) mmHg and 78 (70, 80) mmHg, and among females were 75.09 (8.70) mmHg and 76 (70, 80) mmHg.
- 10.4% of the patients had pallor and only 2.3% of the patients were having jaundice. (Table 4)
- 2.3% of the patients had purpuric spots and 6.9% of the patients developed sub-conjunctival haemorrhage. (Table 4)

- On clinical examination, 9.2% of the patients were found to be having hepatomegaly and 5.2% of the patients were found to be having splenomegaly. (Table 4)
- Respiratory crackles were heard among 9.2% of the patients.
- None of the patients were found to be having altered sensorium.

B. Laboratory and other investigations (Table.5)

- Total leucocyte count on admission was less than 4000 (cells/ μ L) among 41.6% of the study subjects and platelet count less than 100000 among 56.6% subjects. Urea, creatinine, total bilirubin, SGPT and SGOT were raised among 5.8%, 16.2%, 13.9%, 53.2% and 42.8% among the total patients.
- The mean (SD) urea and creatinine value was 29.10 (12) and 1.36 (2.29) respectively. The serum total bilirubin, SGPT and SGOT value was 1.12(0.54), 67.68 (47.85) and 47.04 (28.18) respectively.
- Pulmonary edema on chest X-ray was observed in 6.4% of the patients.
- On USG of whole abdomen, 6.9% were having splenomegaly and 1.7% were having hepatomegaly, while, 4% were having both hepato-splenomegaly.

Discussion

The endemicity of dengue is rapidly increasing and has witnessed a significant increase with rapid expansion to more than 100 countries in Africa, America, Eastern Mediterranean, South-East Asia and Western Pacific areas from urban to rural settings and worst affected regions are South-East Asia and Western Pacific regions¹⁵. The identification is by clinical features but they can present with varied manifestations. This present study was conducted to evaluate associated clinical manifestations as well as laboratory findings which

would be beneficial in early recognition and proper management of dengue infected patients.

Sreenivasulu T et al. in their study “A study of clinical profile of patients with Dengue fever at a tertiary care hospital” observed that among the patients 90% presented with headache, 53% with retro-orbital pain, 63% with myalgia, 52% with nausea/vomiting and among bleeding manifestations, epistaxis, gum bleeding and haematuria (15%) were the common symptoms¹⁶. The present study found 83.2% presented with headache, higher cases with retro-orbital pain, little higher cases of myalgia, similar prevalence of nausea/vomiting among the total subjects.

Sreenivasulu T et al. in their study observed that among the patients 13% had pallor, 15% had icterus, 33% had conjunctival congestions, 41% had rashes and 34% had purpura. In our study, we found less case with pallor and only 2.3% of the patients were having jaundice, 2.3% of the patients had purpuric spots and 6.9% of the patients developed sub-conjunctival haemorrhage¹⁶.

Sreenivasulu T et al. observed more cases with hepatomegaly, splenomegaly and hepato-splenomegaly than our study finding, which may be explained by different study setting or different sample composition¹⁶.

Turbadkar T et al in their study “Laboratory and clinical profile of dengue: A study from Mumbai” reported higher cases (25.8%) had icterus, 25% with myalgia and only 13.9% with headache¹⁷.

A study by Dr. Nitin Jain on “Study of Clinical Profile of Dengue Fever: An Institutional Based Prospective Study” reported that 67% had headache, 58% presented with myalgia, 27% with abdominal pain and 46% with vomiting¹⁸. The present study found that urea, creatinine, total bilirubin, SGPT and SGOT were raised among 5.8%, 16.2%, 13.9%, 53.2% and 42.8% among the total patients.

Chitkara S et al in their study "Epidemiology of Dengue Fever among clinically Suspected Febrile Patients at A Tertiary Care Center in Punjab" reported that urea, creatinine, total bilirubin, SGPT and SGOT were raised among 12%, 14.6%, 20% and 84.1% patients respectively¹⁹. Total leucocyte count on admission was less than 4000 (cells/ μ L) among 41.6% of the study subjects and platelet count less than 100000 (cells/ μ L) among 56.6% subjects.

Chitkara S et al found 43% of patients had total leucocyte count on admission was less than 4000 (cells/ μ L) and higher cases (93.1%) with platelet count less than 100000 (cells/ μ L)¹⁹.

Conclusion

We conclude from this study that:

- Headache, myalgia and nausea/vomiting were the most common presented history along with fever.
- Leucopenia was present among 41.6% of the patients and thrombocytopenia was observed among more than half of the subjects.
- Liver enzymes were altered among almost half of the study participants.

Limitation

1. Small sample size
2. Single centre study
3. Confined to a single calendar year
4. Platelet counts on automated counters might not reflect the actual number
5. Referral teaching hospital based study has a selection bias
6. Patients received treatment before presenting to the study centre

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suspected febrile patients at a tertiary care center in Punjab. Journal of Microbiology and Infectious Diseases. 2018 Feb;8(02):43-8.

Tables and figures

Table 1: Headache as a clinical presentation.

	Frequency	Percentage
Absent	29	16.8
Present	144	83.2
Total	173	100

Table 2: Rash as a clinical presentation

	Frequency	Percentage
Absent	150	86.7
Present	23	13.3
Total	173	100

Table 3: Bleeding manifestation at presentation

	Frequency	Percentage
Absent	160	92.5
Present	13	7.5
Total	173	100

Table 4: Clinical signs at presentation

	Pall or	Jau ndi ce	Sub conj hge	Perp uric spot	Hepato megaly	Splenom egaly
No of Patie nt	18	4	4	12	16	9
Prese nt	10.4	2.3	2.3	6.9	9.2	5.2

Table 5: Distribution of study subject according to Haematological parameters

Blood counts	Mean (SD)
Hemoglobin	12.66 (1.96)
PCV-day1	38.35 (5.78)

PCV-day2	40.91 (31.30)
PCV-day3	39.88 (20.47)
TLC- day1	4926.59 (2662)
TLC- day2	5018.32 (2458.81)
TLC- day3	5132.12 (2003.56)
TLC- day4	5261.62 (1898.60)
Platelet-day 1	106381.51 (57798.58)
Platelet-day2	122557.80 (187805.78)
Platelet-day3	119945.09 (52668.48)
Platelet-day4	132309.25 (53141.85)
ESR	13.18 (8.30)
PT/INR	1.03 (0.10)

Figure 1: shows distribution of study subjects according to clinical findings

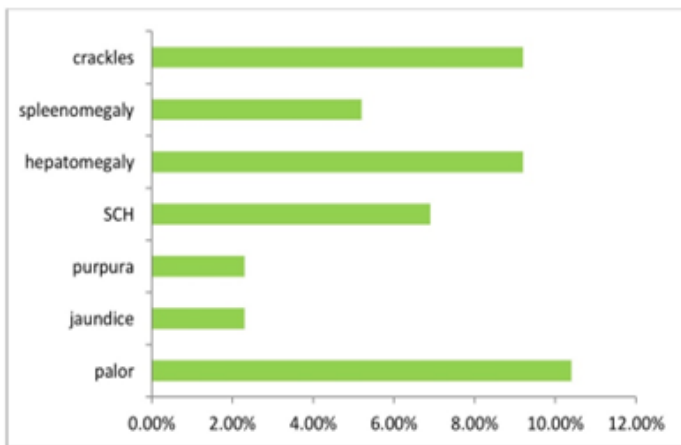


Figure 2: distribution of study subjects based on daily TLC count

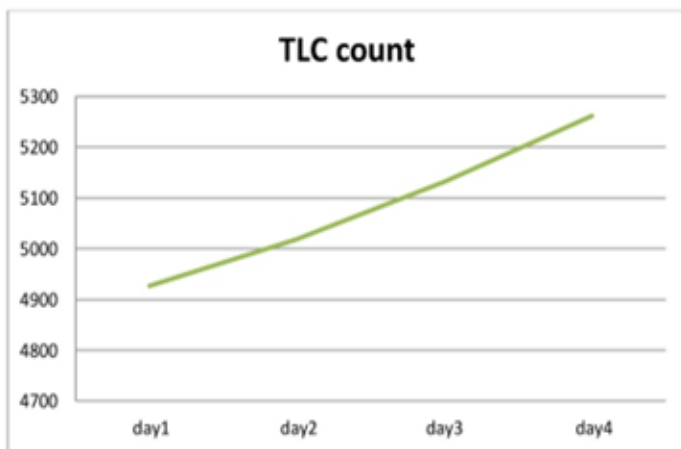


Figure 3: Distribution of study subjects based on PCV

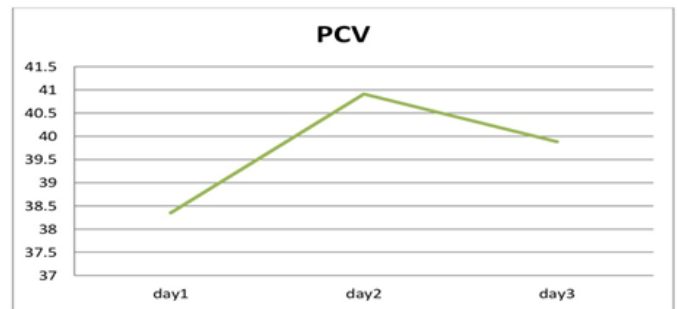


Figure 4: distribution of the study subjects based on daily platelet count

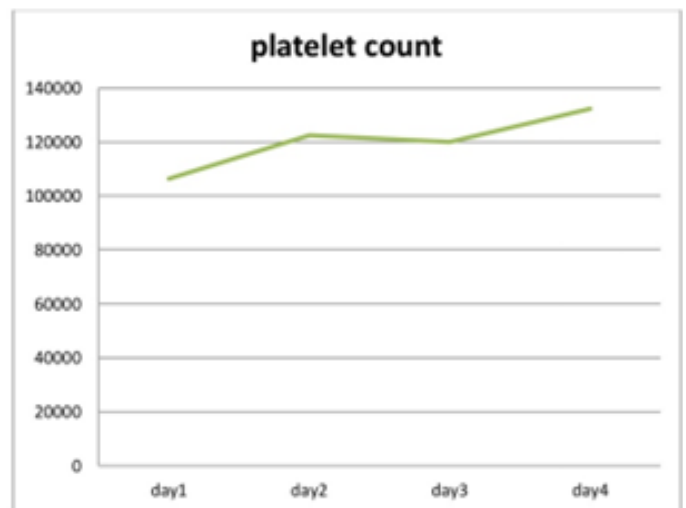


Figure 5: Distribution of the study subjects according to ultrasonography of whole abdomen findings (n=173)

