Clinical features & outcome of dengue cases at a tertiary care centre

MN Islam1, SN Chowdhury2, SM Hossain3, AS Mousi4

Abstract

Background: Dengue is a very common seasonal public health problem causing significant mortality every year. In 2019 an outbreak occurred in Bangladesh. Few new manifestations and multi-organ involvement were found.

Objective: The objective of the study was to see the clinical and laboratory manifestations and outcome of dengue fever in a medical college hospital.

Methods: It was an observational study in a medical college hospital in Bangladesh. Study period was one year. The patients were confirmed cases of dengue. Apart from detailed clinical history, examination of patient, relevant investigations and follow up was done until discharge.

Result: Total number of cases was 98. Out of them 62 (63.2%) were male and 36 (36.73%) were female. Fever was most common (100%) manifestation and duration of fever ranged from 5 to 8 days with a mean duration of 6.3 (± 1.0) days. Among other symptoms, generalized body ache was most common (63, 64.3%). Generalized weakness was present in 60 cases (61.2% cases) and bleeding manifestations were present in 41 cases; abdominal manifestations were found in 11 cases. Blood for NSI was positive in 94 (95.9%) cases; most cases (71, 72.4%) became positive between 2nd to 4th day. Ninety (91.9%) cases developed thrombocytopenia and it started at 5th day in 45 (45.9%) cases. Blood transfusion was given in 12 (12.2%) cases and platelet transfusion was given in 3 (3.1%) cases. Complete recovery was in 96 (98%) cases and Death occurred in 2 (2.0%) cases.

Conclusion: Bleeding was a dominant presentation. Some atypical manifestations like gastrointestinal features were also observed. These findings will help physicians in early diagnosis of dengue.

Keywords: Dengue, Fever, Thrombocytopenia, Hematocrit.

Introduction

Dengue is an acute infection characterized by fever, headache, muscle and joint pains, rash, nausea and vomiting. Dengue infections may also be asymptomatic or may lead to (a) “classical” Dengue fever (DF), or (b) Dengue hemorrhagic fever (DHF) without shock, or (c) Dengue hemorrhagic fever (DHF) with shock. It is caused by an arbovirus and spread by Aedes mosquitoes. Among all flaviviruses, it is the most common. The dengue virus is a RNA virus and is of 4 serotypes (DENV 1-4). The virus serotypes are closely related but antigenically distinct. Infection with one serotype of Dengue Virus (DENV) provides lifelong immunity to that serotype, but results only in partial and transient protection against subsequent infection by the other three serotypes. It is possible for a person to be infected as many as four times, once with each serotype. It is well established that re-infection with different DENV serotypes increases the risk of developing DHF. Since 2000, Bangladesh has experienced dengue fever in every year. All four serotypes have been detected, with DENV-3 predominance until 2002. Approximately half of the world’s population is at risk, especially people residing in tropical and subtropical climates. Dengue infection is a major challenge to public health, especially in South-East Asia for several years. The incidence of dengue has increased dramatically around the world in recent decades. Bangladesh had sporadic transmission of dengue virus from 1964 to 1999, but the first outbreak due to dengue virus type 3 occurred in 2001 with dengue outbreaks occurring at increasing frequency and magnitude since then. Rapid increase in the dengue cases in 2019 became a public health concern in

1. Md Nazrul Islam, FCPS, Assistant Professor, Dept. of Medicine, Khulna Medical College, Khulna. E-mail: drmdnazrul@gmail.com
2. Sabikun Nahar Chowdhury, DCP, Junior Consultant, Dept of Pathology, Khulna Medical College Hospital, Khulna
3. Sk Moazzem Hossain, FCPS, Assistant Professor, Dept of Medicine, Khulna Medical College, Khulna
4. Arina Shorani Mousi, MBBS, Honorary Medical Officer, Khulna Medical College Hospital, Khulna
Bangladesh. Dengue has a wide geographical distribution and can present with a diverse clinical spectrum.2 Maximum patients present with fever and some directly present with bleeding manifestations. In recent years gastrointestinal manifestations and shock is becoming more common. Over 50 million cases of dengue hemorrhagic fever (DHF) occur in Asian countries.3 Reported case fatality rate is about 5%.4 For reduction of morbidity and mortality early diagnosis and prompt treatment is essential. Detailed evaluation of clinical and laboratory parameters will help in better understanding of the disease process and will help in development of treatment and thus will improve outcome of the disease. The objective of this study was to assess the manifestations of the dengue infection and to evaluate the outcome of dengue fever in a tertiary care hospital.

Materials and methods
It was a prospective observational study in a medical college hospital in Bangladesh. Study period was from January 2019 to December 2019. The whole number of patients included in our study was 98 (n=98). Confirmed cases of dengue fever admitted in Dengue isolation ward of Khulna medical college hospital were taken into account by purposive sampling method. All patients were with positive dengue tests, either NS1 antigen or IgM. Patients who were positive for malaria, meningitis, and enteric fever were excluded from the study. This was an observational study and no interruption of investigations and management was done.

History included age and sex, fever, headache, myalgia, arthralgia, retro-orbital pain, nausea, vomiting, jaundice, breathlessness, sore throat, bleeding from nose, bleeding from gum, blood in vomiting, blood in stools, blood in urine and blood in sputum. The patient was examined in detail for various clinical signs like pallor, icterus, cyanosis, lymphadenopathy, edema of feet, facial edema, and signs of dehydration like weak and thready pulse, sunken eyes etc, conjunctival congestion and presence of rashes over the body. Detailed examination was also done for the signs of bleeding manifestations like Purpura, Petechiae, ecchymoses, low blood pressure i.e. hypotension, cold and clammy peripherals, etc.

Cases were followed up daily for the clinical and laboratory parameters. Blood parameters were monitored every day till remarkable improvement seen clinically and haematologically. TC of WBC, Total Platelet Count, Hb%, haematocrit for each patient were recorded. Daily vitals were monitored. Chest X ray, ultrasonography, and liver function tests were done on selected cases. The patients were treated with oral paracetamol intravenous fluids, blood and platelet transfusion and inotropes, when necessary. The frequency of various signs and symptoms and the laboratory tests were calculated. The results were tabulated and correlated. The outcomes were recorded.

Results
Total number of cases was 98. Of them 62 (63.3%) was male and 36 (36.7%) was female. The male female ratio was 1.7: 1. Most of the patients 27 (27.6%) was in the age group of 21-30 years followed by age group of 13-20 years (26.5%). (Table I). Sixty two (63.3%) patients were attacked at the month from June to October. Average Hospital stay was 7.4 (± 1.3) days. Duration of fever ranges from 5 to 8 days with a mean duration of 6.3 (± 1.0) days.

| Table 1 |
| --- |
| Distribution of cases on age and gender |
| Demographic variables | No | Percentage |
| Sex | | |
| Male | 62 | 63.2 |
| Female | 36 | 36.7 |
| Age group (Years) | | |
| 13-20 | 26 | 26.5 |
| 21-30 | 27 | 27.6 |
| 31-40 | 20 | 20.4 |
| 41-50 | 16 | 16.3 |
| 51-60 | 7 | 7.1 |
| >60 | 2 | 2.1 |

Fever was present in all 98 (100%) cases. Among other symptoms generalized body ache was present in 63 (64.3%) cases, generalized weakness in 60 cases (61.2%) cases, headache in 49 (50%) cases (Table II).

| Table II |
| --- |
| Clinical Features of dengue cases |
| Symptoms | No | Percentage |
| Fever | 98 | 100 |
| Generalized bodyache | 63 | 64.3 |
| Generalized weakness | 60 | 61.2 |
| Headache | 49 | 50 |
| Bleeding | 41 | 41.8 |
| Ascites | 4 | 4.1 |
| Vomiting | 4 | 4.1 |
| Pleural effusion | 2 | 2.0 |
| Diarrhoea | 2 | 2.0 |
| Abdominal pain | 1 | 1.0 |
Bleeding manifestations was present in 48 (48.9%) cases-out of them melaena in 20 (20.4%) and rash in 7 (7.1%) cases (Table III).

| Types of bleeding       | No | Percentage |
|-------------------------|----|------------|
| Melaena                 | 20 | 20.4       |
| Rash                    | 7  | 7.1        |
| Per vaginal bleeding    | 5  | 5.1        |
| Gum bleeding            | 4  | 4.1        |
| Haematochezia           | 3  | 3.1        |
| Haemoptysis             | 3  | 3.1        |
| Sub conjunctival haemorrhage | 2  | 2.0        |
| Haematemesis            | 2  | 2.0        |
| Haematuria              | 1  | 1.0        |
| Epistaxis               | 1  | 1.0        |

Abdominal manifestations were found in 11 (11.2%) cases - ascites in 4(4.1%) cases; vomiting in 3(3.1%) cases, diarrhea in 3 (3.1%) cases, abdominal pain in 1(1.1%) case. Pleural effusion was present in 2 (2.0%) cases. Pulse volume was decreased in 30 (30.6%) cases. Mean Pulse pressure was 36.2 (±7.7) mm Hg. Nine (9.2%) patients were presented with Shock. Of them 2 (2.1%) died.

Blood for NSI was positive in 94 (95.9%) cases, most cases (72.4%) become positive between 2nd to 4th day. Among them 31 (31.6%) become positive at 3rd day of fever followed by 20 (20.4%) cases at 2nd day; 20 (20.4%) cases at 4th day (Table IV). Anti IgM was positive in 4 (4.1%) cases; 2 (2.0%) at 4th day and 2 (2.0%) at 5th day of illness.

| Day of onset of thrombocytopenia |
|----------------------------------|
| Day | No | Percentage |
|-----|----|------------|
| 3   | 10 | 10.2       |
| 4   | 20 | 20.4       |
| 5   | 45 | 45.9       |
| 6   | 15 | 15.3       |

Lowest platelet count was at 6th day in 41(41.8%) cases, at 7th day in 31(31.6%) cases & at 5th day in 18 (18.4%) cases. Mean Hct value is 40.13 (± 5.0). Hct value decreased in 48.0% of male and 30.6% cases of female patients. [Table VI].

| Hct value of study cases |
|--------------------------|
| Sex | Hct (%) | No | Percentage |
|-----|---------|----|------------|
| Male| <42     | 47 | 48.0       |
|     | 42-54   | 15 | 15.3       |
|     | >54     | 0  | 0          |
| Female| <38   | 30 | 30.6       |
|       | 38-46   | 3  | 3.1        |
|       | >46     | 3  | 3.1        |

SGPT was increased in 53 (54.1%) cases. In 40 (40.8%) cases values were between 41-80 IU/L and in 13 (13.2%) cases value were above 80 IU/L. S creatinine was increased in 20 (20.4%) cases. Transfusion was given in 15 (15.3%) cases. Among them Blood transfusion was given in 12 (12.2%) cases & Platelet transfusion was given in 3 (3.1%) cases. Complete recovery was in 96 (98.0%) cases and Death occurred in 2 (2.0%) cases.

Discussion
In our study male was more common than female. The male to female ratio was 1.7:1. In a study by Raut A male was 75% and female 25%. According to Jalily QA dengue fever occurs more in male patients than their female counterparts.6 Most of the patients (53%) was between age 13-30 years. This finding is similar to a study by Hasan SR where 58.9% cases were within 13-30 years of...
Similar Results are found in different studies.\textsuperscript{11,12} Fever was most common (100%) presentation. Kasikunti M suggests that fever was the most common presenting symptom (100%) in and around India.\textsuperscript{9} In another study by Shultana K fever was present in 100% cases.\textsuperscript{10} In our study duration of fever ranges from 5 to 8 days with a mean duration of 6.3 (± 1.0) days. In this study we found that generalized body ache was second most common (63, 64.3%) presentation. Generalized weakness was present in 60 cases (61.2% cases), headache in 49 (50%) cases. Generalized weakness was present in 60 cases (61.2% cases), headache in 49 (50%) cases. Similar Results are found in different studies.\textsuperscript{11,12} Bleeding manifestations were present in 48 (45.0%) cases. Among them melaena in 20, rash in 7, per vaginal bleeding in 5, gum bleeding in 4, haematochizia in 3, haemoptysis occurred in 3 cases. In a study by Jain De et al found 31.6% of patients had bleeding episodes in the form of petechiae (12.8%) and malena (7.9%). Epistaxis was most common bleeding manifestation (70%) in another study in Bangladesh.\textsuperscript{10} Pulse volume was decreased in 30 (30.6%) cases and normal in 68 (69.4%) cases. But more cases of low pulse volumes were found (65% cases) in a study by Choudhury J where Mean Pulse pressure was 36.2 (±7.7) mm Hg. Abdominal manifestations were found in 11 (11.2%) cases. Among them Ascites was found in 4 (4.1%) cases; vomiting in 3 (3.1%) cases, diarrhoea in 3 (3.0) cases, abdominal pain in 1 (1.0) case. In a study by Padyana abdominal manifestations were more prevalent like vomiting in 58.3%, abdominal pain 41.7%, diarrhea in 20.8% cases.\textsuperscript{11} Pleural effusion was present in 2 (2.0%) cases. It was present in 9% cases in a study by Sreenivasulu T.\textsuperscript{2} Blood for NSI was positive in 94 (95.9%) cases & Anti IgM was positive in 4 (4.1%) cases; most cases 71 (72.4%) of NSI became positive between 2nd to 4th day. Among them majority cases 31 (31.6%) of NSI become positive at 3rd day of fever. In the study done by metha, 52% cases were positive for NSIAg while 41% and 26% were positive for IgG and IgM respectively.\textsuperscript{14} Total count of WBC was normal in 73 (74.5%) cases but among them in 50 (51.0%) cases were at the lower end of normal limit. (4000-5000 /cc). Leucopenia was found in 21 (21.4%) cases and leukocytosis in 4 (4.1%) cases. Leucopenia was present in 9.3% cases in a study by Alam S.\textsuperscript{15} Thrombocytopenia was very common (91.8%) in our study and also in other studies.\textsuperscript{5} Platelet count started declining in most cases (46.0%) at 5th day. Lowest platelet count was at 6th day in 30 cases, 7th day in 21 cases; 5th day in 18 cases. In a study by Thai KT platelets began to drop below 100 000/mm\textsuperscript{3} from day 4 of the disease and both tended to recover on day 9.16 Mean Hct value is 40.1 (±5.0). In our study Hct value was decreased in most of the cases (78.6%). This finding is contradictory to most of the studies.\textsuperscript{17,18} SGPT was increased in 53 (54.1%) cases. In 40 (40.8%) cases values were between 41-80 IU/L and in 13 (13.2%) cases above 80 IU/L. In a study by Nayak et al liver involvement was noted among 97.3% cases.\textsuperscript{19} S creatinine was increased in 20% cases in our study. Blood transfusion was needed in 12 (12.2%) cases and Platelet transfusion was needed in 3 (3.1%) cases. These findings were similar to a study by Tewari KN et al.\textsuperscript{20} In our study complete recovery occurred in 96 (97.95%) cases and death in 2 (2.0%) cases. In a study by Ghazala the mortality rate was found about 10%. Another study in Bangladesh reported 6% mortality rate.\textsuperscript{15} Regarding limitation, dengue cases with atypical presentation and multi organ dysfunction couldn’t be evaluated in detail. Large scale study involving multiple centre might have given a better picture.

\textbf{Conclusion}

Dengue has wide spectrum clinical presentation starting from flu like illness to life threatening hemorrhage and shock with many new and atypical manifestations. Thus, a high index of suspicion for early diagnosis, monitoring and prompt fluid management and supportive treatment can significantly decrease case fatality rate.

\textbf{References}

1. Sharmin S, Viennet E, Glass K, Harley D. The emergence of dengue in Bangladesh: epidemiology, challenges and future disease risk. Trans R Soc Trop Med Hyg 2015; 109: 619-27
2. Sreenivasulu, T, Johnavi K. A study of clinical profile of patients with Dengue fever at a tertiary care hospital; Int J Adv Med 2018; 5: 202-206
3. Choudhury J, Mohanty D, Routray SS. Clinical profile and outcome of dengue fever and dengue hemorrhagic fever in pediatric age group. Int J Contemp Pediatr 2016; 3: 442-44
4. WHO. "Dengue and dengue haemorrhagic fever". Factsheet no. 117, World Health Organization, Geneva, Switzerland, 2008
5. Rauit A, Vohra F, Rahul S, Shradha T, Pawar A. Clinical characteristics and management of dengue fever in Indian teaching hospital; Infection, Disease and Health 2016; 21: 86-7
6. Jalily QA, Pavani G, Nandeswara A. Screening for dengue infection in clinically suspected cases in a rural teaching hospital. J Microbiol Biotech Res 2013; 3: 26-29
7. Hasan SR, Riaz K and Jafri FA, Characteristics and outcome of dengue infection, clinical perspective from a secondary care hospital of Karachi. Pak J Med Sci. 2013; 29: 115-18

8. Ghazala Z, Anuradha HV, Shivamurthy MC. Pattern of management and outcome of dengue fever in pediatric in patients in a tertiary care hospital: a prospective observational study. International Journal of Basic & Clinical Pharmacology 2017; 3: 534-88

9. Kashinkunti MD, Shiddappa, Dhananjaya M. A study of clinical profile of dengue fever in a tertiary care teaching hospital. Sch J App Med Sci 2013; 1: 280-82

10. Shultana K, Rahman M, Baki AA, Khan SI, Deb B. Chowdhury D, et al. Dengue Infection in children: Clinical Profile and Outcome in Dhaka City. American Journal of Pediatrics 2019;5: 111-15

11. Padyana M, Karanth S, Vaidya S, Gopaldas JA. Clinical Profile and Outcome of Dengue Fever in Multidisciplinary Intensive Care Unit of a Tertiary Level Hospital in India. India J Crit Care Med 2019; 23: 270-77

12. Hammond NS, Balmaseda, A, Perez, Tellez Y, Saborio SI, Mercado JC et al. Differences in dengue severity in infants, children, and adults in a 3 year hospital-based study in Nicaragua. Am J Trop Med Hyg 2005; 73: 1063-70

13. Jain D, Rajput R, Pathak V, Mittal A, Jain P. Changing Trends in Clinical Presentation and Biochemical Spectrum of Dengue Fever: An Observation of a Tertiary Care Centre, Arch Clin Infect Dis 2017; 12: 622-24

14. Mehta RP, Vijapura TY, Gandhi DJ, Gajjar D. Comparative study of 112 cases of dengue fever out of which 8 cases of dengue mortality in outbreak of 2012, at tertiary care centre of Smt. N.H.L Municipal Medical College, Ahmadabad, Gujarat, India. International journal of medical research 2013; 2: 459-61

15. Alam S, Sadat SA, Swapan Z, Ahmed AU, Karim MN, Paul HK et al; Clinical Profile of Dengue Fever in Children; Bangladesh J Child Health 2009; 33: 55-58

16. Thai KT, Phuong HL, Nga. TT, Giao PT, Hung LQ, Nam NV, et al. ’Clinical, epidemiological and virological features of Dengue virus infections in Vietnamese patients presenting to primary care facilities with acute undifferentiated fever’. Journal of Infection 2010;60: 229-37

17. Chacko, B, Subramanian G. Clinical, Laboratory and Radiological Parameters in children with dengue fever and predictive factors for dengue shock syndrome. J Trop Pediatr 2007; 54: 137-40

18. Shah I, Deshpande GC, Tardeja PN. Outbreak of dengue in Mumbai and predictive markers for dengue shock syndrome. J Trup Pediatr 2004; 50: 301-05

19. Nayak J, Behera S, Swain SK, Panda SR. A study of multiorgan dysfunction in patients with dengue and its clinico-hematological correlation with severity. Asian J Pharm Clin Res 2017; 10: 218-21

20. Tewari KN, Tuli NR, Devgun SC. Clinical profile of dengue fever and use of platelets in four tertiary level hospitals of Delhi in the year 2009. J Indian Acad Clin Med 2013; 14: 8-12