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ORIGINAL ARTICLES

CLINICAL PRESENTATION OF DENGUE IN 150 ADMITTED CASES IN DHAKA MEDICAL COLLEGE HOSPITAL

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Abstract:

Dengue fever was not recognized as a major public health hazard in Bangladesh before 1999 outbreak, so there was little evidence and awareness in this regard. A prospective observational study was carried out to determine the risk group of patients suffering from dengue syndrome; clinical parameters of the subjects for hospitalization and the pattern of presentation of dengue fever in hospital care in different medicine units of Dhaka Medical College hospital from July 2000 to March 2001. Total 150 cases were selected randomly and diagnosed clinically as dengue, and were classified into 3 groups, i.e. 18 cases of classical dengue fever, 127 cases of dengue hemorrhagic fever (DHF-I and DHF-II) and 5 cases of dengue shock syndrome (DSS), and were discharged uneventfully. Among them 125(83.3%) were male and 25(16.7%) were female. Mean ages of the subjects were 26.75 ±3.69, 27.59 ± 1.18 and 10.67 ± 2.33 years in respective groups. Mean temperature was 103.45±0.28, 103.08±0.13, and 104.00±1.00 °F with mean duration was 5.50±0.51 days, 6.12±0.2 days, and 5.00±1.15 in respective groups. Majority had profound weakness, headache, myalgia, anorexia, nausea, and vomiting. Diarrhoea, abdominal pain, organomegaly, ascites, and pleural effusion were frequent complaints in group-3 patients, whereas infrequent complaints in other groups. Haemorrhagic manifestations were common in group 2 and 3 patients, melaena being the most common manifestations.

Introduction:

Dengue is the most important arthropod-borne viral disease, and it is a major public health problem in subtropical and tropical regions. The virus is transmitted to humans by the bite of infected female mosquitoes of the genus *Aedes*. The global resurgence of dengue is thought to be due to failure to control the *Aedes* populations, uncontrolled urbanization, population growth, climate change, and increased airplane travel[1]. Dengue is caused by one of the four closely related, but antigenically distinct, virus serotypes 1 to 4(DEN-1, DEN-2, DEN-3, and DEN-4), and is a frequent cause of febrile illness in the tropical and subtropical areas of the world[2]. Dengue viruses, single stranded RNA viruses of the family Flaviviridae, are the most common cause of arboviral disease in the world. They are found virtually throughout the tropics and cause an estimated 50-100 million illnesses annually, including 250 000-500 000 cases of dengue haemorrhagic fever a severe manifestation of dengue and 24 000 deaths[2,3]. More than two fifths of the world's population (2.5 billion) lives in areas potentially at risk for dengue[3]. Dengue is considered to be one of the most important infectious diseases in these regions[4].

DF is a severe, flu- like illness that affects infants, young children and adults, but seldom causes death[2]. The first documented outbreak of DF in Bangladesh was in 1965 when it was called "Dhaka fever"[5]. The 1st sero-epidemiological study of Bangladesh to detect dengue infection was done at Chittagong Medical College hospital (CMCH), Chittagong in 1996 through 1997, and was found that 13.75% cases of fever were seropositive for dengue infection[6]. In Bangladesh, an outbreak of DF and DHF occurred in and around Dhaka city during the summer of 1999[7].Since then dengue cases are reported every year in different media and series[6-9].

The clinical features of dengue vary with the age of the patient and, in addition to clinically inapparent

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infections, can be classified into five presentations: non-specific febrile illness, classic dengue (DF), dengue haemorrhagic fever (DHF), dengue haemorrhagic fever with dengue shock syndrome (DSS), and other unusual syndromes such as encephalopathy and fulminant liver failure[10,11].

Young children with dengue often have an undifferentiated febrile illness with a maculopapular rash. Upper respiratory infections, especially pharyngitis, are common. Most infections in children under 15 years are asymptomatic or minimally symptomatic; a study of school children in Thailand found only 13% of those infected missed more than one day of school because of illness[12]. Classic dengue is more commonly seen among older children, adolescents, and adults. They are less likely to be asymptomatic. Dengue is abrupt in onset, typically with high fever accompanied by severe headache, incapacitating myalgia and arthralgia, nausea and vomiting, and rash. Rash, typically macular or maculopapular, often becoming confluent and sparing small islands of normal skin, has been reported in over half of infected people. Other signs and symptoms include flushed facies, sore throat, cough, cutaneous hyperaesthesia, and taste aberrations. Recovery may be prolonged and include depression[13].

The hallmark of dengue hemorrhagic fever is capillary leakage, accompanied by hemorrhagic manifestations. The presentation of patients in the first days of the illness is similar to that seen in dengue fever, but plasma leakage develops four to seven days after the onset of the disease, at approximately the time of deffervescence. Abdominal pain and vomiting, restlessness, a change in the level of consciousness, and a sudden change from fever to hypothermia may be the first clinical warning signs and are often associated with a marked decrease in the platelet count[13].

The diagnosis of dengue hemorrhagic fever is made on the basis of the following triad of symptoms and signs: hemorrhagic manifestations; a platelet count of less than 100,000 per cubic millimeter; and objective evidence of plasma leakage, shown either by fluctuation of packed-cell volume (>20% during the course of the illness) or by clinical signs of plasma leakage, such as pleural effusion, ascites, or hypoproteinemia. Hemorrhagic manifestations without capillary leakage do not constitute dengue hemorrhagic fever. A positive tourniquet test is incorporated in the WHO clinical case definition of dengue hemorrhagic fever, but the definition differentiates poorly between dengue and dengue hemorrhagic fever and is not very specific[14]. Mortality rates from dengue hemorrhagic fever can range as high as 10 to 20 percent, but they are as low as 0.2 percent in hospitals with staff experienced in the management of the disease[2,13,15].

Dengue shock syndrome is characterized by a rapid, weak pulse with a narrowing pulse pressure of less than 20 mm Hg, or profound hypotension (systolic pressure of less than 90 mm Hg among those five years of age or older). The duration of shock is short. Typically, patients either recover rapidly after appropriate volume-replacement therapy is administered or die within 12 to 24 hours; the mortality rate is up to 40 percent[13,15].

In most of the cases the disease can be managed well according to the guideline provided by WHO[16]. In this guideline severity of dengue is stratified on the basis of fluid leakage and bleeding.

Materials and Method:

The study was carried out at DMCH from July 2000 to March 2001. A total of 150 dengue patients were recruited who were diagnosed on the basis of WHO criteria and confirmed by the presence of anti-dengue IgM and IgG antibody. Study subjects are classified into 03 (three) groups depending on the clinical and laboratory findings. Subjects are selected according to the selection criteria and excluded following the exclusion criteria. Statistical analysis were done using SPSS to see correlation between clinical manifestations and severity of dengue infection.

Selection criteria:

Group- 1(DF):

Subjects with acute febrile illness for not more than 2-7 days having the manifestations like

1. Sudden onset of fever plus
2. 2 or more of the following features i.e. a) severe headache, b) retro orbital pain, c) severe myalgia, arthralgia, backache, and d) leucopoenia plus

3. Absence of convincing evidence of any other febrile illness.

Group- 2 (DHF):
Group 1 manifestations plus hemorrhagic manifestation evidenced by one or more of the followings.

1. Positive tourniquet test.
2. Petechiae, ecchymosis, purpura
3. Bleeding from different sites like epistaxis, gum bleeding, haematemesis, melaena, haematuria, menorrhagia and
4. Any evidence of plasma leakage manifested by

- A 20% rise in PCV for the age or sex and / or
- A 20% drop in PCV following treatment with intravenous fluid and/ or
- Pleural effusion, ascites, hypoproteinemia.

Group -3(DSS):
Subjects with DHF manifesting circulatory failure as follows

1. Hypotension for age and/ or
2. Narrow pulse pressure (<20 mmHg) and/ or
3. Profound shock.

Exclusion criteria
1. Pregnancy
2. Patients with other co morbid conditions

Results
A total 150 clinically and serologically diagnosed dengue infection were classified into three groups, i.e. 18 (12%) cases of dengue fever (group 1), 127 (84.67%) cases of dengue hemorrhagic fever/ DHF (group 2), and 5(3.33%) cases of dengue shock syndrome/ DSS (group 3). The majority of the study subjects were male and male to female ratio was 5:1(table-1). Group 3 (DSS) patients were significantly ($p<0.05$) younger and 100% were below 20 years of age. Mean ages of group-1 subjects were 26.75±3.69 and group-2 subjects were 27.59 ±1.18 years (table-2).

Table-I
Distribution of study subjects (patients) according to sex

Groups	Male		Female		Ratio
	No.	%	N0.	%	Male: female
Group-1, N=18	12	66.7	06	33.3	2:1
Group-2, N=127	111	87.4	16	12.6	6.94: 1
Group-3, N=05	02	40.0	03	60.0	1:1.5
Study subjects,N=150	125	83.33	25	16.7	5:1

Table- II
Distribution of study subjects according to the age interval.

Age Interval	Group-1, N=18		Group-2, N=127		Group-3, N=05	
	No	%	No	%	No	%
< 10 years	00	00	00	00	02	40
10-19 yrs	09	50	34	26.8	03	60
20-29 yrs	03	16.7	56	44.1	00	00
30-39yrs	05	27.8	23	18.1	00	00
40-49yrs	00	00	10	07.9	00	00
50- above	01	5.5	04	03.1	00	00

All the patients had fever and almost all of them experienced sudden onset (100%, 93.7%, and 100% in 3 groups respectively). Majority had profound weakness (83.33%, 96.8%, and 100% respectively). Mean temperature of group-1, group-2, and group-3 was 103.45±0.28°F, 103.08±0.13°F, and 104.00±1.00 °F (table-3). 100%, 44.4%, and 26% subjects of group-3, group-1, and group-2 experienced sustained temperature. While intermittent fever was recorded in 54.3%, and 44.4% of group-3, and group-1 patients. Saddle back fever was only seen in 18.1% (group-2) and 11.1% (group-1) patients. Mean duration of fever was 5.50±0.51 days in group-1, 6.12±0.2 days in group-2, and 5.00±1.15 in groups-3 subjects. Majority of the patients i.e. more than 77% of all groups experienced different grades of sweating predominantly of moderate grade.

Table - 3

Distribution of the study subjects according to the highest temperature.

Temperature	Group-1 (N = 18)		Group-2 (N = 127)		Group-3 (N = 05)	
	No	%	No	%	No	%
99.0°-100.0°F	00	00	02	1.6	00	00
100.1°-101.0°F	00	00	06	4.7	00	00
101.1°-102.0°F	05	27.8	36	28.3	00	00
102.1°-103.0°F	00	00	37	29.1	00	00
103.1°-104.0°F	13	72.2	30	23.6	03	60
104.1°-105.0°F	00	00	14	11.0	02	40
105.1° & above	00	00	02	01.6	00	00

Table- 4

Distribution of the study subjects according to pain pattern experienced by them.

Pain pattern	Group-1 (n=18)		Group-2 (n=127)		Group-3 (n=05)	
	No	%	No	%	No	%
Headache	17	94.4	100	78.7	05	100
Myalgia	17	94.4	104	81.9	05	100
Low back pain	08	44.4	68	53.5	05	100
Retro- orbital pain	06	33.3	43	33.9	05	100
Arthralgia	05	27.8	56	44.1	05	100
Arthritis	00	00	22	17.6	00	00

Headache and myalgia were the common clinical presentations .100% of group-3 patients had complained of headache, myalgia, low-back pain, retro-orbital pain and arthralgia. Retro-orbital pain was present only in 33% group-1 and 33.9 % group-2 subjects. Low backache was recorded in 44.4% of group-1 and 53.5% of group-3 subjects (table -4). Anorexia, nausea, and vomiting were common in all groups. Diarrhea and abdominal pain were present in 100% cases in group-3, whereas infrequent complains in other groups (table-5).

Table-5

Abdominal complains of the study subjects.

Abdominal complain	Group-1 (n=18)		Group-2 (n=127)		Group-3 (n=05)	
	No	%	No	%	No	%
Anorexia	15	83.3	77	60.6	05	100
Nausea	17	94.4	75	59.1	05	100
Vomiting	13	72.2	92	74.4	05	100
Diarrhea	03	16.7	39	30.7	05	100
Abdominal distention	00	00	08	06.3	00	00
Abdominal pain	06	33.3	35	27.6	05	100

Table- 6

Different types of rash and hemorrhagic manifestations.

Types of rashes & hemorrhagic manifestations	Group-1 (n=18)		Group-2 (n=127)		Group-3 (n=05)	
	No	%	No	%	No	%
Macular	02	11.1	14	11.0	02	40
Maculo-papular	02	11.1	13	10.2	00	00
Erythematous	02	11.1	23	18.1	00	00
None	12	66.7	77	60.6	03	60
Positive tourniquet test	03	16.7	95	74.8	04	80
Gum bleeding	00	00	47	37	05	100
Conjunctival hemorrhage	00	00	27	21.3	01	20
Petechial hemorrhage	00	00	06	04.7	00	00
Ecchymosis	00	00	12	09.4	00	00
Purpura	00	00	15	11.8	00	00
Epistaxis	00	00	10	07.9	00	00
Haematemesis	00	00	31	24.4	00	00
Melaena	00	00	83	65.3	00	00
Haematuria	00	00	06	04.7	00	00
Haemoptysis	00	00	12	09.4	00	00
>1 bleeding manifestations	00	00	87	68.5	05	100

Different types of rash i.e. macular, maculo-papular and erythematous rashes over the trunk were observed. 67% of group-1 and 60% of group-2 and group-3 subjects had no rash. Melaena (OBT +ve) was the common hemorrhagic manifestation (66.3% in group-2 & 100% in group-3) followed by gum bleeding (37% in group-2 & 100% in group-3). Majority of the patients of group-2 (68.5%) and group-3 (100%) had more than one bleeding manifestations. Tourniquet test was positive in 16.7% of group-1, 74.8% of group-2 and 80% of group-3 subjects (table-6). Organomegaly was observed very rarely except in group-3 (60% had hepatomegaly and 40% had spleenomegaly). Majority of the group-3 also had ascites (80%) and 40% had pleural effusion (table-7). Only three (two of group-2 & one in group-3) patients had jaundice, none had hepatic encephalopathy.

Table- 7

Organomegaly and collection of fluid in potential space (ascites & pleural effusion).

Organomegaly &ascites/ pleural effusion	Group-1 (n=18)		Group-2 (n=127)		Group-3 (n=05)	
	No	%	No	%	No	%
Spleen	00	00	02	1.6	02	40
Liver	00	00	10	7.9	03	60
Lymph node	00	00	00	00	00	00
Ascites	00	00	02	00	04	80
Pleural effusion	00	00	02	1.6	02	40
Ascites & p. effusion	00	00	04	1.6	02	40

Discussion:

In this study, we primarily focused on the clinical manifestations and their associations with the severity of 150 clinically and serologically proved dengue patients. DSS patients were significantly ($p<0.05$) younger. Mean age of the subjects were 26.75 ±3.69, 27.59 ± 1.18 and 10.67 ± 2.33 years respectively of group-1, group-2 and group respectively. Chareonsook O et al[17] showed that adults are now also being affected with DHF/DSS. Wali JP et al[18] showed that mean age was 31±5.2 (SD), with most of the patients were in the range of 20-50 years, which is almost similar to this study.

Majority of the patients experienced high-grade fever. Only a small number of subjects (22.2%, 30.7% and 60% in respective 3 groups) experienced chills and rigor, but Anuradha S et al[19] showed that fever was of high grade with chills and rigors. Mean duration of fever (5.50±0.51 days in G-1, 6.12±0.2 days in G-2, and 5.00±1.15 in G-3 subjects) in our study was similar to that of Anuradha S et al (4.8±1.32 days), but differ to that of Wali JP et al[18] (4±1.12 days).

Anuradha S et al[19] reported 96% of her study subjects suffered myalgia and other aches while Wali JP et al[18] showed headache in 80.9%, myalgia 76.2%, arthralgia 52.3% and these were the common symptoms which are similar to the findings in this study. Richards AL et al reported headache in 96.7%, backache in 39.1%, and retro-orbital pain in 13.1% of all his 72 study subjects, which are closely related to the present study. Respiratory symptoms are infrequent findings in our study. None of them experienced dyspnoea. Only a small number of group-1 and group-2 subjects complained of cough (18.1%), chest pain (24%), and prostration.

Anorexia, nausea, and vomiting were common complains of all study subjects. Diarrhea and abdominal pain were common complains in group-m 3 patients, whereas infrequent complains in other groups, which was very similar to Wali JP et al[18] study. Organomegaly was infrequent finding, except in group- 3 patients. Ascites (80%) and pleural effusion (40%) was also common in group-3 patients. Kabra SK et al[20] found ascites in 87%, pleural effusin in 74% in DSS patients, whereas only 27% DHF without DSS had ascites and pleural effusion. Sai PMV et al[21] on his sonographic study on fifth to seventh day of fever showed that all had gall bladder wall thickening, 21% had hepatomegaly, 7% had splenomegaly, 96% had ascites, 87.5% had right pleural effusion, 66% had left pleural effusion and 28.5% had pericardial fluid and concluded, in an epidemic of dengue, ultrasound features of thickened gall bladder wall, pleural effusion and ascites should strongly favored the diagnosis of dengue fever. Jaundice was found only in 2% of patients, which was less than that of Kabra SK et al[20].

Different pattern of rash over the trunk e.g. macular 12%, maculopapular 10%, and erythematous 10% (total >37%) were observed. Tourniquet test was positive in 16.7%, 74.8%, and 80% patients of consecutive three groups. Phuong CXT et al[14] showed that 712 dengue-infected children had considerable overlap in the major clinical features. Mucosal bleeding was observed with equal frequency in those with dengue fever and dengue hemorrhagic fever (DHF), and petechiae, thrombocytopenia, and the tourniquet test differentiated poorly between the two diagnostic categories. Kabra SK et al[20] reported tourniquet test positive in 40% of classical dengue,

62% of DHF, and 64% 0f DSS patients. Melaena was the commonest haemorrhagic manifestations (group2 -65.3% and group3- 100%) followed by gum bleeding manifestations (group2 -37% and group3- 100%). More than one variety of haemorrhagic manifestations was observed in most patients (group2 – 68.5% and group3- 100%), which was very similar to the findings of Wali JP et al[18] and Anuradha S et al[19]. Haemorrhagic manifestations were common one day after subsidence of fever.

Conclusion:

During the initial outbreak, the nature of the disease, non-acquaintance of the professionals and unfamiliarity on the part of the general people has made the situation a panic. Patients with dengue syndrome showed varied presentation and the symptoms are non specific. So it necessitates clinical awareness to combat mortality and morbidity. In this study, we tried to find out the clinical parameters with varied presentations to create better awareness and clinically diagnostic skills among the health care providers and people to identify and refer the patients promptly to proper health care facilities to avert the ultimate danger.

References:

1. Identification of Dengue Virus in Respiratory Specimens from a Patient Who Had Recently Traveled from a Region Where Dengue Virus Infection Is Endemic. J Clin Microbiol 2007; 45(5): 1523-27.
2. Gubler DJ. Dengue and dengue hemorrhagic fever. Clin Microbiol Rev 1998; 11: 480.
3. World Health Organization. Dengue haemorrhagic fever: diagnosis, treatment, prevention and control, 2nd edn. Geneva: WHO, 1997.
4. Parry J. Experts predict big rise in dengue fever in South East Asia. BMJ 2003; 327: 1368.
5. Aziz MA, Graham RR, Gregg MB. 'Dhaka fever'- an outbreak of dengue. Pak J Med Res 1967; 6: 83-92.
6. Eunus EB. Dengue and dengue hemorrhagic fever: Bangladesh perspective. JCMCTA 1999; 10: 1-8.
7. Alam MN. Dengue and dengue hemorrhagic fever in Bangladesh. Orion Med J 2000; 6:7-10.
8. Ahmed T, Alam MB. Dengue fever: Bangladesh aspect. J Medicine 2001; 2:1.
9. Afroze A, Chowdhury MAJ, Kibria G, Saha RK, Jalil MA, Khan MA. Clinical profile and outcome of dengue patients during the first outbreak in Dhaka- a hospital based study. Bangl J Med 2002; 13:16-20.
10. Innis BL. Dengue and dengue hemorrhagic fever. In: Porterfield JS, eds. Kass handbook of infectious diseases: exotic virus infections. London: Chapman and Hall Medical, 1995:103-46.
11. Isturiz RE, Gubler DJ, Brea del Castillo J. Dengue and dengue hemorrhagic fever in Latin America and the Caribbean. Infect Dis Clin North Am 2000; 14: 121-140.
12. Burke DS, Nisalak A, Johnson DE, Scott RM. A prospective study of dengue infections in Bangkok. *Am J Trop Med Hyg* 1988; 38: 172-180.
13. Gibbons RV, Vaughn DW. Dengue: an escalating problem. BMJ 2002; 324:1563-66.
14. Phuong CXT, Nhan NT, Kneen R, Thuy PTT, Thien CV, Thuy TT, et al and The Dong Nai Study Group.Clinical diagnosis and assessment of severity of confirmed dengue infections in Vietmamese children: is the World Healte Organization classification system helpful? Am J Trop Med Hyg 2004; 70: 172-179.
15. Wilder-Smith A, Schwartz E. Dengue in Travelers. NEJM 2005; 353:924-32.
16. Alam R, Siddiqui FM, Rahman S. Management of dengue by the WHO guided national guidelines. Mymensingh Med J 2004; 13: 43-47.
17. Chareonsook O, Foy HM, Teeraratkul A, Silarug N. Changing epidemiology of dengue haemorrhagic fever in Thailand. Epidemiol infect 1999; 122: 161-6.
18. Wali JP, Biswas A, Handa R, Agarwal P, Wig N, Dwivedi SN, et al. Dengue haemorrhagic fever in adults: A prospective study of 110 cases. Trop Doct 1999; 29: 27-30.
19. Anuradha S, Singh NP, Rizvi SN, Agarwal SK, Gur R, Mathur MD. The 1996 outbreak of dengue haemorrhagic fever in Delhi, India. South East Asian J Trop Med Public health 1998; 29(3): 503-6.
20. Kabra SK, Jain Y, Pandey RM, Singhal T, Tripathi P, Broor S, et al. Dengue haemorrhagic fever in children in the 1996 Delhi epidemic. Trans Royal Soc Trop Med Hyg 1999; 93: 294-8.
21. Sai PMV, Dev B, Krishnan R. Role of ultrasound in dengue fever. British J Radiol 2005; 78:416-418.