Presentation, Management and Outcome of Dengue Fever – A Study of 200 Cases

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Abstract

Background: Dengue is the most rapidly spreading mosquito-borne viral disease in the world[1]. The rapidly expanding global footprint of dengue is a public health challenge. The endemicity of dengue is also increasing in Bangladesh. This study highlights our current understanding of dengue, including its clinical manifestations, laboratory tests, management and outcome.

Objectives: This study was designed to document the presenting features and outcome of Dengue infection in Border Guard personnel.

Materials and Methods: It was a prospective observational study which was carried out among outpatient and indoor cases from February 2011 to November 2012 in Border Guard Hospital, Dhaka which is a 300 bedded hospital. Total 200 cases were enrolled. A detailed history, clinical examinations and relevant investigations were done. Data were collected in a predesigned structured questionnaire and analyzed with the help of SPSS-16.0 and Chisquare (X^2) Test.

Results: A total of 200 adult seropositive Dengue cases of various grade were studied. Among these 152(76%) were male and 48 (24%) were female. Male to female ratio was 3.17:1. The age range of the patients was 18 to 60 years and the mean age 39±12.56 years. Among 200 patients, 112(66%) were Dengue Fever (DF) and 88(44%) were Dengue Haemorrhagic Fever (DHF) including 3(1.5%) cases of DHF Grade III but none (0%) had Grade-IV DHF.

All the patients presented with fever 200(100%), general weakness 200(100%) followed by various skin rash 196(98%), headache 192(96%), myalgia/arthralgia 191(95.5%), retroorbital pain 84(42%). Bleeding manifestation showed in 94(47%) cases of which petechiae was most frequent 86(43%),

Haematocrit was normal only in 13(6.5%) patients and 82(41%) had a rise of >20%; Leucopenia was found in 187(93.5%) patients. Only 2(1%) patients had normal platelet count and 03(1.5%) patients had platelet count of less than $10X10^9$/L. Raised serum alanine aminotransferase (ALT) was observed in 184(92%) of cases. All (200%) the patients recovered completely from the disease; however, one patient subsequently developed Guillein Barre Syndrome.

Conclusion: High persistent fever, profound general weakness, myalgia, headache and itchy skin rash were the usual presenting features. Most of the patients recovered well with efficient symptomatic and supportive treatment. Very few cases required blood/platelet transfusion. There was no case fatality in this study group.

Keywords: Dengue, Dengue haemorrhagic fever, Outcome, Bangladesh

Introduction

Dengue is a self-limited, systemic viral infection transmitted between humans by mosquitoes. Dengue fever (DF) and its severe forms - dengue haemorrhagic fevers (DHF) and dengue shock syndrome (DSS) have become major international public health concerns. Over the past three decades, there has been a dramatic global increase in the frequency of DF, DHF and DSS.[2]

Approximately 2.5 billion people around the world living in dengue endemic countries of which 1.3 billion live in 10 countries of the WHO South-East Asia (SEA) Region which are dengue endemic areas.[2]

An estimated 50 million infections including 250000-50000 cases of dengue haemorrhagic fever (DHF) and 24000 deaths per year occur across approximately 100 countries,[3]

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In Bangladesh, first documented case of dengue like fever occurred in 1964 popularly known as "Dacca fever" which later serologically proved as Dengue Fever.[4] The magnitude of dengue fever was largely unknown until it took a heavy toll in 2000 (5,555 cases and 93 deaths); 2001(2,430 cases and 44 deaths) and 2002(6,104 cases and 58 deaths).[2]

Symptomatic dengue virus infections can present with a wide range of clinical manifestations, from a mild febrile illness to a life-threatening shock syndrome. [2,5]

Both viral and host factors are thought to contribute to the manifestations of disease in each infected individual. The risk of severe disease is much higher in sequential rather than in primary dengue infection.

The etiologic agent (DENV) belongs to the Flavi viridae family and to the Flavivirus genus, with 4 serotypes.[6]

This study describes the clinical and biochemical parameters, management and outcome of serologically confirmed dengue cases.

Materials and Methods

This prospective observational study was carried out between both OPD and indoor patients of Dengue Fever at Border Guard Hospital from February 2011 to November 2012. After obtaining informed consent a total of 200 serologically

positive patients were selected for the study. Patient with any identified specific infection or febrile illness more than 10days were excluded from the study. Demographic variables, presenting complaints, physical examination findings and laboratory investigation results were recorded on a structured questionnaire. Dengue cases were diagnosed on the basis of clinical definition and the detection of IgM Dengue Ab by ELISA method. The cases were classified according to WHO Comprehensive Guidelines for Prevention and Control of Dengue and Dengue Haemorrhagic Fever, 2011. Data were collected in a predesigned structured questionnaire and analyzed with the help of SPSS-16.0 and Chisquare (X^2) Test.

Results

A total of 200 patients with Dengue Fever of various grade were studied. Among these 152(76%) were male and 48 (24%) were female. Male to female ratio was 3.17:1. Age ranged from 18 years to 60 with a mean of 39±12.56 years. Detailed demographic data is shown in table-I.

Table-I

Demographic variables

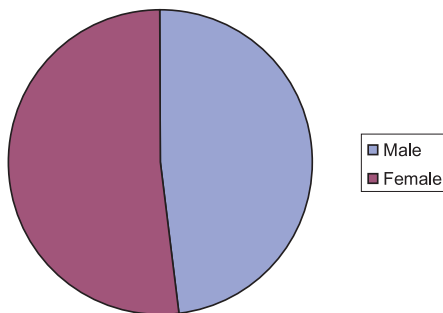| Age (years)	No. (n=200)	(%)
18-45	143	71.5
46-60	57	28.5
Sex		
Male	152	76
Female	48	24

Fig.-1. *Male : Female Ratio*

All the patients presented with fever 200(100%), general weakness 200(100%) followed by various skin rash 196(98%), headache 192(96%), myalgia/arthralgia 191(95.5%), retroorbital pain 84(42%). Persistent fever was found in 162 (81%) and classical saddle back fever in 38 (19%) cases. Other striking features were pruritus 146 (73%), cough 68 (34%), rhinitis 73 (36.5%), diarrhoea 46 (23%), vomiting 36 (18%), constipation 28 (14%), abdominal pain 16 (08%). Restlessness and lethargy was observed only in 8 (4%) and 2 (1%) cases respectively. 196 (98%) patient had flushed appearance, followed by conjunctival injection 184 (92%). various skin rash 175 (87.5%), injected pharynx 88 (44%), Hepatomegaly was found in 21 (10.5%), splenomegaly 12 (6%), hepatosplenomegaly 3 (1.5%), pleural effusion 11 (5.5%), ascites 8 (4%).

Bleeding manifestation showed in 94 (47%) cases of which petechiae was the most frequent 86 (43%), followed by subconjuctival haemorrhage 26 (13%), gum bleeding 14 (07%). Other bleeding manifestation were rare; echymosis 5 (2.5%), epistaxis 4 (2%), haematemesis 2 (1%), melaena 3 (1.5%) and PV bleeding 2 (1%). More than one type of bleeding manifestation was observed in 16 (8%) of cases. Torniquette test was positive only in 12 (6%) cases. Table-II shows clinical features in detail.

Table II

Clinical Features

	No. (n=200)	(%)
Symptoms:		
Fever	200	100
Headache	192	96
Myalgia/arthralgia	191	95.5
Retroorbital pain	84	42
General weakness	200	100
Skin rash	196	98
Pruritus	146	73
Various types of bleeding	94	47
Diarrhoea	46	23
Vomiting	36	18
Constipation	28	14
Abdominal pain	16	08
Cough	68	34
Rhinitis	73	36.5
Restlessness	08	04
Lethargy	05	2.5
Signs		
Pyrexia	200	100
Flushed appearance	196	98
Rash	175	87.5
Injected pharynx	88	44
Generalized Lymphadenopathy	03	1.5
Conjunctival injection	184	92
Enanthema	08	04
Jaundice	04	02
Abnormal reflex	00	00
Hepatomegaly	21	10.5
Splenomegaly	12	06
Hepatosplenomegaly	03	1.5
Pleural effusion	11	03
Ascites	08	02
Coma	00	00
Haemorrhage		
Gum bleeding	14	07
Subconjuctival haemorrhage	26	13
Petechiae	86	43
Echymosis	05	2.5
Epistaxis	04	02
Haematemesis	02	1.5
Melaena	03	02
PV bleeding	02	01
More than one type of bleeding manifestations	16	08
Tourniquet test		
Positive	12	06
Negative	188	94

Table III
Duration & Pattern of Fever

Duration of fever (days)	(mean 5.5 ± 1.87 days)	%
<7	142	71
>7	58	29
Pattern of fever		
Persistent	162	81
Saddle-back	38	19

Haematocrit was normal only in 13(6.5%) patients and 82(41%) had a rise of >20%; Leucopenia was found in 187(93.5%) patients. Only 2(1%) patients had normal platelet count and 3(1.5%) patients had platelet count of less than 10×10^9/L. Raised serum alanine aminotransferase (ALT) was almost universal, 193 (96.5%) cases. IgM Dengue Ab was positive in 138 (69%) patients and both the IgM and IgG Dengue Ab were positive in 62 (31%) cases.

Table IV
Investigation Findings

Name of Investigations	No. (n=200)	(%)
Haematocrite		
Normal	13	6.5
5-10 % Rise	47	23.5
11-20% Rise	58	29
>20% Rise	82	41
WBC Count		
Leucopenia	187	93.5
Normal	13	06.5
Platelet count		
>150X10^9/L	02	01
100-150X10^9/L	85	42.5
51-100X10^9/L	78	39
10-50X10^9/L	32	16
<10X10^9/L	03	1.5
ALT		
Raised	184	92
Normal	16	08
CXR Pleural effusion	08	04
USG Abdomen		
Hepatomegaly	24	12
Splenomegaly	17	08.5
Ascites	06	03

Table V
Antibody Pattern

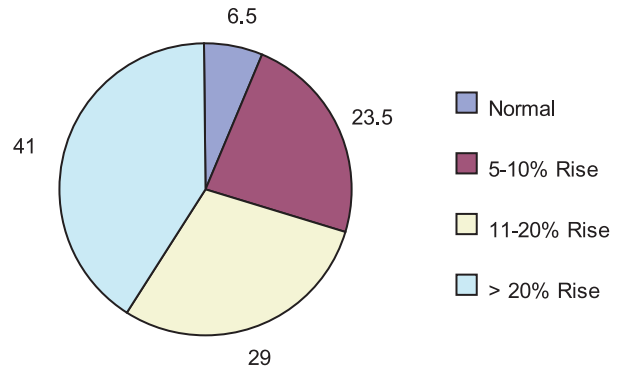| Antibody	No (n = 200)	%
IgM	138	69
Both IgM & IgG	62	31

Fig.-2: *Haematocrit Values*

Among all cases DF were 112 (56%), DHF-I 61 (30.5%), DHF-II 24 (12%), DHF-III 3 (1.5%) cases. No patient was diagnosed to have DHF-IV.

Table VI
WHO Grading of Dengue Fever

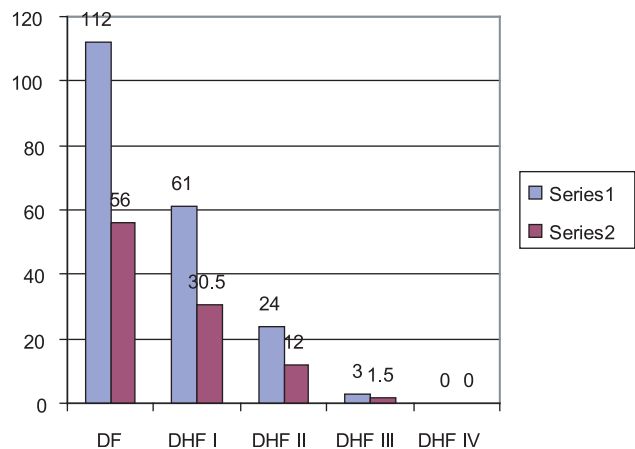| Grading	No (n = 200)	%
DF	112	56
DHF I	61	30.5
DHF II	24	12
DHF III	03	1.5
DHF IV	00	00

Fig.-3. *Grading of Dengue*

84 (42%) patients were managed in the outdoor with follow up as case to case basis. Rest 116 (68%) patients were admitted. among admitted cases all the patient required fluid infusion. 4 (2%) patients required transfusion of whole blood and 3 (1.5%) required platelet transfusion.

Table VII
Modalities of Treatment

Treatment Modalities	No (n=200)	%
Paracetamol	200	100
ORS	174	87
IV Fluid	113	66.5
Antibiotics	08	04
Antihistamine	152	76
Steroid	00	00
Blood Transfusion	04	02
Platelet concentrate	03	1.5

All (200%) the patients recovered completely from the disease; however, one patient subsequently developed Guillein Barre Syndrome.

Table VIII
Treatment Outcome

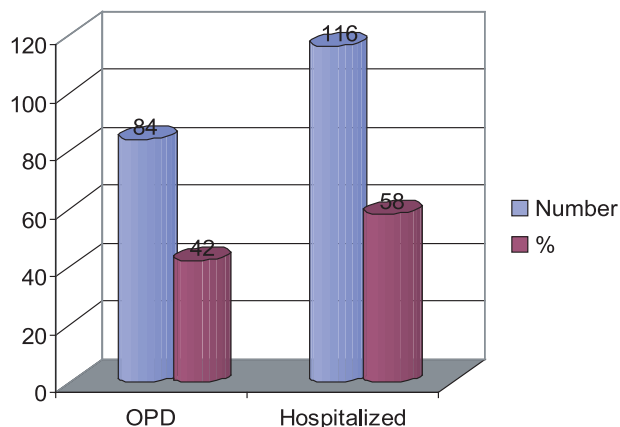|	No (n=200)	%
OPD	84	42
Hospitalized	(n=116)	58
DHF	88	100
DF	18	16.07
Duration of hospital stay	(n=116)	
>5 days	91	45.5
<5 days	22	11
Recovered	200	100
Death	00	00

Fig.-4. *Distribution of OPD & Hospitalized Patients*

Discussion

A male preponderance with a male to female ratio of 3:2 was observed by Ahmed et al[9] which is almost similar to our study 3.17:1. Whereas Hanif Mohammad[7] et al found the sex ratio as 5:1. Classical features of Dengue cases in this series are comparable with those of Hanif Mohammad[7] et al and Quazi Tarikul Islam[8] et al. Flushed appearance and conjunctival injection were very common findings and helpful in the clinical diagnosis of Dengue fever in early stage. Hepatosplenomegaly (1.5%) was rare but isolated hepatomegaly (10.5%) and splenomegaly (6%) were not uncommon and was associated mostly with DHF-III cases.

In our study DF were 112 (56%), DHF-I 61 (30.5%), DHF-II 24 (12%), DHF-III 3 (1.5%) cases. It was almost similar to the study of ABM Shahidul Alam[9] et al. We have not found any patient to have DHF-IV, but ABM Shahidul Alam[9] et al found it 11.1% which is much higher. In this series most common bleeding manifestation was petechiae (43%) which differ from the study of Hanif mommad[7] et al where melaena (59%) was the most common. In our study bleeding from various sites were 16 (8%) cases which was 54% in the study of Agarwal[10] and 56.4% in that of Wali[11] et al and major bleeding manifestations were rare. Fewer bleeding manifestation observed in our study is likely due to less secondary dengue infection or overall reduction of severity of dengue infection. Efficient management might have also contributed to reduced morbidity.

Hepatic dysfunction is common in dengue infection, and is attributed to a direct viral effect on liver cells or as a consequence of dysregulated host immune responses against the virus.[12] In our study S. SGPT was almost universally raised (92%) which is similar to that of Ngyen[13] et al and Uddin KN[14] et al.

Some patients with platelet count of 20×10^9/L did not manifest any bleeding whereas few showed spontaneous bleeding even with platelet count of $50-100 \times 10^9$/L which is similar to Hossain Bahar SK[15] et al's study.

Only 4 (2%) patients needed blood and 3 (1.5%) needed platelet transfusion. In Hossain Bahar SK[12] et al's study blood transfusion was required in 15.07% and platelet transfusion in 4.11% cases. All the patient in this study made an uneventful recovery with the symptomatic and supportive therapy along with close monitoring. However one patient subsequently presnted with Guillain Barre Syndrome.

Overall mortality was nil in our study, but it was 3.8% in Agarwal[10] et al's study; ABM Shahidul Alam[9] et al found case fatality as 6% and Wali et al as 10.91%.

Conclusion

In this study we tried to find out the pattern of clinical presentation, management and outcome of the dengue cases. Flushed appearance with skin rash and subconjunctival injection were striking clinical features in classical cases of Dengue fever. Very few patients showed bleeding manifestations and shock was rare. Thrombocytopenia was almost universal. Leucopenia was very common. Raised ALT was observed as a common association.

Patient awareness, efficiency of the physician in early diagnosis and prompt recognition of severe cases, proper management have admirably reduced the panic, morbidity and mortality in dengue cases in our country.

Recommendation

1. Dengue cases should be diagnosed clinically.
2. Most of the cases can be managed in outpatient departments.
3. In general laboratory investigations should be limited to platelet count and haematocrit initially.
4. Dengue Ab testing is not required in the management of Dengue fever.
5. Raised SGPT may be considered as a marker of dengue severity.
6. Severe Dengue cases must be recognized early to avoid case fatality.
7. Health education related to prevention of Dengue incidences in the community is urgently required.

Conflict of Interest : None

References:

1. WHO. Dengue: guidelines for diagnosis, treatment, prevention and control. New edition, 2009.

2. World Health Organization, Regional Office for South-East Asia. Comprehensive guidelines for prevention and control of dengue and dengue haemorrhagic fever. Revised and expanded edition. SEARO Technical Publication Series No. 60. ISBN 978-92-9022-387-0 © World Health Organization 2011

3. Gubler DJ. Dengue and dengue haemorrhagic fever.Clin Microbiol Rev 1998;11:480

4. Aziz M, Graham RR,Gregg MB."Dacca fever" An outbreak of dengue.Pak j Med Res 1967;6:83-92

5. Teixeira MG, Barreto ML. Diagnosis and management of dengue. BMJ 2009; 339:b4338.

6. Kabir A, Abdullah AA, Sadeka MM et al. The impact of dengue on liver function as evaluated by aminotransferase levels. J MEDICINE 2008; 9 : 66-68.

7. Hanif M, Devendra N S, Robed M A, BASHER A, AHMED T, Clinical Profile and Outcome of Patients with Dengue Syndrome In Hospital Care, J medicine 2011; 12 : 131-138

8. Quazi tarikul islam, ariful basher, robed amin. Dengue: A Practical Experience of Medical Professionals in Hospital. J medicine 2012; 13 : 160-164 .

9. Abm Shahidul Alam, S Anwar Sadat, Zakaria Swapan.Clinical Profile of Dengue Fever in Children .consists of 4 serotypes (DEN 1 - 4). In Bangladesh. Bangladesh J Child Health 2009; VOL 33 (2): 55-58.

10. Agarwal R, Kapoor S, Nagor R, Misra A et al. A clinical study of the patients with DHF during the epidemic of 1996 at Lucknow, India. Internet.

11. Wali JP, Biswas A, Handa R et al. Dengue haemorrhagic fever in adults a prospective study of 110 cases. All India Institute of Med Sc, New Delhi, India. Internet.

12. Kalayanarooj S, Vaughn DW, Nimmannitya S, Green S, Suntayakorn S, Kunentrasai N, et al, Early clinical and laboratory indicators of acute dengue illness., J Infect Dis. 1997; 176(2):313.

13. Nguyen TL, Nguyen TH, Tieu NT. The impact of dengue hemorrhagic fever on liver function. Res Virol 1997; 148: 273-7.

14. Uddin KN, Musa AKM, Haque WMM, et al. A follow up on biochemical parameters in dengue patients attending BIRDEM hospital. Ibrahim Med. Coll. J. 2008; 2(1): 25-27

15. Bahar Hussain SK, Razzak A, Parveen Shaila et all. Clinical pattern of dengue fever - a descriptive study of 146 casess. Bangladesh Armed Forces Medical Journal. Volume XXVIII June 2001.