Original Research Article

Clinical profile of dengue fever in a tertiary care centre in North Kerala

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ABSTRACT

Background: Dengue fever is the most common arboviral disease and fifty percent of world population is at risk. Frequent outbreaks are reported from all states of our country and incidence increases every year. This case study is of 305 patients from Academy of Medical Sciences, which is a tertiary care centre and research Institute in North Kerala. The objective of this study was to study the clinical profile of dengue fever.
Methods: Study was prospective observational study conducted during the epidemic for a period of one year. All the cases which fulfilled WHO criteria for diagnosis of dengue fever and those who are positive for IGM antibody detected by enzymelinked immunosorbent assay (IgM ELISA) were only included in this study.
Results: There is male preponderance, and those above the age of 30 years affected more. All patients had fever. Gastrointestinal manifestation like nausea and vomiting were commonly observed symptoms. Hepatomegaly, rash and conjuctival suffusion were important physical findings, whereas splenomegaly noted only in 8.2% cases. Thrombocytopenia is noticed in 73.96%.
Conclusions: The mortality is 2.6%. Hypotension and thrombocytopenia are the two important determinants of mortality. Dengue Shock syndrome and Dengue Hemorrhagic Fever were relatively less when compared to other epidemics from different regions.

Keywords: Dengue fever, Dengue shock syndrome, Dengue hemorragic fever, Igm antibody

INTRODUCTION

Dengue fever describes the symptoms complex produced by infection with one of the four serotypes of dengue virus. Dengue virus infection may result in a nonspecific febrile illness or a classical dengue fever. A small percentage of persons develop bleeding manifestations, a syndrome termed dengue hemorrhagic fever (DHF). A subset of patients with dengue hemorrhagic fever develops shock - dengue shock syndrome.[1,2]

Dengue is the most common arthropod - borne viral (arboviral) illness in humans. Globally, 2.5-3 billion individuals live in approximately 112 countries that experience dengue transmission. Approximately 50 - 100 million individuals are infected annually.[3]

Infection with one dengue serotype confers lifelong homotypic immunity to that serotype and a very brief period of partial heterotypic immunity to other serotypes, but a person can eventually be infected by all 4 serotypes.[4] Several serotypes can be in circulation during an epidemic. Dengue is transmitted by mosquitoes of the genus Aedes, principally Aedes aegypti.[5] Frequent epidemics of febrile illness were reported from Kerala, a southern state of India. In this paper, we describe the clinical features and laboratory profile of serologically confirmed cases of dengue fever in Academy of Medical

Sciences (ACME) hospital, Kannur, Kerala during one-year period.

METHODS

This was a prospective observational study. The patient population was identified based on the WHO diagnostic criteria of dengue fever and there are 305 cases were IgM ELISA positive for dengue antibody, were included in this study and evaluated for clinical and demographic profile.[1] A detailed history is taken and physical examination is done of patients admitted with fever who fulfilled the WHO diagnostic criteria of dengue fever. To confirm the diagnosis of dengue fever, dengue IgM Ab Elisa test was sent to the microbiology department and biochemical and other relevant investigations were sent. The study was approved by hospital ethics committee and informed consent was obtained from each patient. Patients with fever, who did not fulfill the WHO criteria for the diagnosis of dengue virus infection, Patients on treatment for other illness and Patients not willing to participate in this study were excluded from the study.

Statistical analysis

Comparison of clinical characteristics of the whole population as well as between the three subgroups-dengue fever, dengue hemorrhagic fever and dengue shock syndrome was done. Descriptive statistical tools like frequency and percentages were used for categorical variables, while mean and standard deviation were used for describing continuous variables. Inferential statistical tools like Chi-Square test and Student's t- test were used. A p- value of less than 0.05 was considered significant. SPSS version 13 and Microsoft office 2007 were used for the analysis and presentation of data.

RESULTS

A total of 305 patients were included in the study, of which 65% were males. The mean age of the subjects was 34.68 years, with a standard deviation of 12.86 years. Among those affected by dengue, around 76% patients were in the age group of 21 to 50 years, also 77% of DF and 80% of DHF patients belonged to the above said age group. Males were more affected than females in all the three groups. Fever was seen in all the patients. Dysuria and oliguria were the most common minor symptoms. Hematemesis was observed in all the three types of dengue. Bleeding manifestation was observed in 61 patients (20%). Eleven patients had more than one bleeding manifestations.

Laboratory parameters of dengue patients

Hemoglobin values were ranged from 5.5 gm/dL to 21 gm/dL with a mean of 13.55 gm/dL and a S.D. of 1.81 gm/dL. DF cases had a mean hemoglobin of 13.52 with a SD of 1.73, DHF cases had a mean hemoglobin level of 14.67 with a SD of 3.18 and the DSS patient had the hemoglobin value of 11. 12.2% of patients with DF, 20% of patients with DHF and the single patient with DSS were found to be anemic. 22.8% of DF and 50% of DHF patients had their hemoglobin values above 15 gm/dL. In 28 male patients hemoglobin was <13gm% and in 26 female patients it was <12gm% and a total of 54 patients (20.38%) had anemia. Erythrocyte sedimentation rate3 ranged from 2 mm. to 88 mm. at the end of first hour with a mean of 12.40 mm. at the end of first hour and S.D. of 11.80 mm. at the end of first hour. Figure shows the distribution of ESR among the different dengue cases. Erythrocyte sedimentation rate is low in most of the cases and only twelve cases (4.1% of DF cases) have ESR above 30 mm. at the end of first hour.

Table 1: Types of dengue.

Type	No.	%
DF	294	96.4
DHF	10	3.3
DSS	1	0.3
Total	305	100.0

Table 2: Age distribution.

Age group	DF		DHF		DSS		Total	
	No.	%	No.	%	No.	%	No.	%
1-10	7	2.4	0	0.0	0	0.0	7	2.3
11-20	33	11.2	2	20.0	1	100.0	36	11.8
21-30	73	24.8	2	20.0	0	0.0	75	24.6
31-40	93	31.6	3	30.0	0	0.0	96	31.5
41-50	59	20.1	3	30.0	0	0.0	62	20.3
51-60	21	7.1	0	0.0	0	0.0	21	6.9
≥ 61	8	2.7	0	0.0	0	0.0	8	2.6

Thrombocytopenia is a common manifestation. 74% of the patients who were tested for platelet count had thrombocytopenia and 57% had a platelet count of less than 1,00,000 /µL. All the DHF patients and the DSS

patient had thrombocytopenia. Patients with bleeding manifestations, 35% cases have platelet count of less than 50,000/cmm. And 65% cases have less than 100,000/cmm. Thirteen patients with bleeding manifestations had a normal platelet count.

Dengue IgM antibody titre distribution in the three groups of Dengue shows that all the DHF patients and the

DSS patient had their dengue antibody titre less than 2 and 18.4% of DF patients had their titre more than 2. The mean value of Dengue IgM Antibody is 2.02 with a SD of 0.19 and statistical analysis showed a significant p-value (0.045). The percentage distribution shows that it was most in DSS, followed by DHF and then by DF.

Table 3: Common symptoms.

Symptom	DF		DHF		DSS		Total	
	No.	%	No.	%	No.	%	No.	%
Nausea	182	61.9	8	80.0	1	100.0	191	62.6
Myalgia	175	59.5	5	50.0	0	0.0	180	59.0
Headache	169	57.5	2	20.0	0	0.0	171	56.1
Vomiting	134	45.6	7	70.0	1	100.0	142	46.6
Diarrhoea	57	19.4	4	40.0	0	0.0	61	20.0
Abdominal pain	54	18.4	4	40.0	0	0.0	58	19.0
Rigor	51	17.3	2	20.0	0	0.0	53	17.4
Cough	45	15.3	1	10.0	0	0.0	46	15.1

Table 4: Clinical signs.

Sign	DF		DHF		DSS		Total	
	No.	%	No.	%	No.	%	No.	%
Hepatomegaly	96	32.7	4	40.0	1	100.0	101	33.1
Skin rash	68	23.1	4	40.0	1	100.0	73	23.9
Conjunctival congestion	70	23.8	2	20.0	0	0.0	72	23.6
Splenomegaly	24	8.2	1	10.0	0	0.0	25	8.2
Bradycardia	21	7.1	1	10.0	1	100.0	23	7.5
Icterus	21	7.1	1	10.0	0	0.0	22	7.2
Tachycardia	17	5.8	2	20.0	0	0.0	19	6.2
Hypotension	18	6.1	0	0.0	1	100.0	19	6.2
GLE#	15	5.1	0	0.0	0	0.0	15	4.9

Generalized lymph node enlargement.

Table 6: Bleeding manifestations.

Bleeding manifestation	DF		DHF		DSS		Total	
	No.	%	No.	%	No.	%	No.	%
Melena	34	11.6	6	60.0	0	0.0	40	13.1
Cutaeneous bleeding	9	3.1	2	20.0	0	0.0	11	3.6
Gum bleeding	8	2.7	1	10.0	0	0.0	9	3.0
Hemetemesis	5	1.7	3	30.0	1	100.0	9	3.0
Sub conjunctival haemorrhage	3	1.0	1	10.0	0	0.0	4	1.3
Hemoptysis	3	1.0	0	0.0	0	0.0	3	1.0
Hematuria	2	0.7	1	10.0	0	0.0	3	1.0
Epistaxis	1	0.3	0	0.0	0	0.0	1	0.3
Bleeding PV#	1	0.3	0	0.0	0	0.0	1	0.3
ICH*	1	0.3	0	0.0	0	0.0	1	0.3

Vaginal bleeding; *Intracranial hemorrhage.

SGOT values ranged from 13 units/liter to 1534 units/liter, with a mean of 189.25 units/liter and SD

214.18 units/liter. DF patients had a mean of 190.30 units/liter with a SD of 218.97 units/liter and DHF

patients had a mean of 171.29 units/liter with a SD of 110.9 units/liter. SGPT values ranged from 12 units/liter to 1530 units/liter with a mean of 162.96 units/liter and SD 259.98 units/liter. DF patients had a mean of 167.65units/liter with a SD of 266.60 units/liter and DHF patients had a mean of 83.29units/liter with a SD of 49.74 units/liter. Among those patients with normal SGOT, the mean platelet count was 146400 with a SD of 87422.60

and among those with raised SGOT, the mean platelet count was 98403.67 with a SD of 74606.51. The mean platelet count among those with normal SGPT was 150523.80 with a SD of 96433.72 and this was found to be significantly higher (p = 0.014) than the mean platelet count of those with raised SGPT, where the mean platelet count was 92132.65 with a SD of 67813.67.

Table 6: Factors associated with mortality.

	Outcome	Mean	SD	p value
Age	Cured	34.41	12.85	0.026
	Expired	44.63	9.35	
Systolic blood pressure	Cured	118.38	15.96	< 0.001
	Expired	84.75	7.70	
Diastolic blood pressure	Cured	76.75	10.25	< 0.001
	Expired	57.50	10.01	
Platelet count	Cured	109201.79	74276.29	< 0.001
	Expired	43625.00	31645.07	
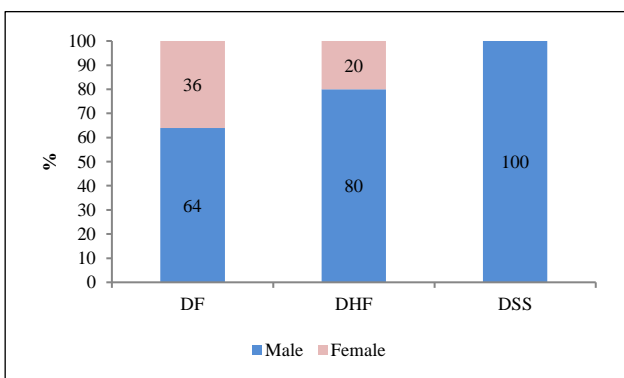
Figure 1: Sex-wise distribution of dengue cases.
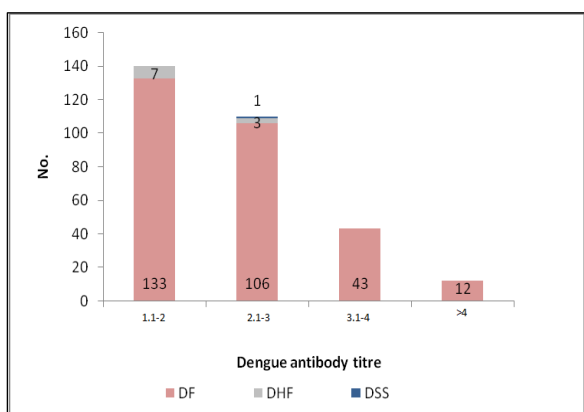
Figure 2: Dengue antibody titre in the three types of dengue.

In the present study, 2.6% of the total dengue patients died. All those who died belonged to the DF group. Among the 289 patients cured of the disease only 8

patients had jaundice, whereas out of 8 patients who expired, two patients had jaundice (p value 0.024). The mean age of patients who expired was 44.6 with a SD of 9.35. All patients who expired had peripheral circulatory failure. The mean systolic blood pressure was 84.75 with a SD of 7.7 and a mean diastolic blood pressure of 57.5 with a SD of 10.01. Very significant relation was observed between thrombocytopenia and poor outcome (p value <0.001).

DISCUSSION

This study was based on the analysis of 305 patients admitted at Academy of Medical Science Hospital, Pariyaram. The selection of cases were based on the WHO case definition and supported by dengue 1gM Ab detection by ELISA method. The results obtained were compared with those of other studies in this field. The incidence of dengue hemorrhagic fever was 3.3% and dengue shock syndrome was only 0.3% in our study.

The most common age group affected was 31-40 years age group (31.5%). The other two age groups 21-30 years (24.6%) and 41-50 years (20.3%) were also significant population affected. The age group affected most was 18 to 30 years (70.86%) in the clinical study by Shah V and Jain U from Ahammadabad and 67% patients were belonging to 20 - 39 age group in the study by Chhotala YH and Suva CM from Jamnagar.[6,7] Many studies from endemic areas showed that children were commonly affected. Our population had no previous sensitization and hence the adults were commonly affected. Men were more frequently affected than women (M: F =1.8:1). The clinical study by Shah V and Jain U from Ahammadabad noted a ratio of M: F=1.9:1 which is similar to present study. Fever was the most common presentation (100%),

which is in unison with other similar studies from India and South-East Asia.[2,8-11] Headache (56%) and myalgia (59%) were seen in majority of cases and diffuse erythematous skin rash in 23%. In a study conducted by Mandal et al have headache in 62.16% and rash in 37.84% of cases.[12] Thrombocytopenia may not be the sole causative factor for development of these rashes as they developed in patients with platelet counts above 50,000/cumm. Dengue virus interacts with host cells, causing release of cytokines and stimulation of immunologic mechanism causing vascular endothelial changes, infiltration of mononuclear cells and perivascular edema.[13]

Conjunctival suffusion is present in 23.6% patients in our study. Generalized lymphadenopathy is present only in 4.9% patients and which is less compared to other studies. Muniraja et al documented conjunctival congestion in 2.6 to 7.3% of cases which is much less than our study.[14] Hepatomegaly was common in our study and distinctively more common in DHF/DSS group. 31.5% of DF, 40% of DHF and 100% of DSS cases had hepatomegaly. The study by Rajesh D et al, from Agra showed 14.8% patients had hepatomegaly. Generally, it was reported that more than 90% of Asian subjects with DHF have hepatomegaly.[15]

Splenomegaly is a less common finding and is seen in 8.2% cases. It was present in 11.33% cases of study by Adhikari P.[16] Hemorrhagic manifestations were seen in 22.3% patients in our study. Commonest manifestation is melena which was present in 13.1% patients. Cutaneous bleeding was present in 3.6% patients and gum bleeding and hemetemesis in 2.9% each. One patient had intracerebral hemorrhage.

In the present study, 2.6% of the total Dengue patients died. All those who died belonged to the DSS group. Among the 289 patients cured of the disease only 8 patients had jaundice, whereas out of 8 patients who expired, two patients had jaundice (p value 0.024). Limitation of this present study was single centre study.

CONCLUSION

Men were more affected. All the patients presented with fever and gastrointestinal symptoms like vomiting were common. Hepatomegaly, skin rash and conjuctival congestion were common clinical findings. Lymphadenopathy and splenomegaly were noticed in 8.2% cases. Hemorrhagic fever and dengue shock syndrome were rare in this study. Both systolic and diastolic pressure and thrombocytopenia were noticed as significant factors in determining the mortality. This study highlights the need to monitor the blood pressure and platelet count frequently in all suspected dengue fever patients.

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