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Original Research Article.

A Study of Clinical Profile of Dengue Fever with Statistical Analysis of Acute Complications

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ABSTRACT

Background: Dengue fever is typically a self-limited disease with a mortality rate of less than 1% when identify early and with access to proper medical care. The rising incidence of dengue fever in India can be contributed by the rapid urbanization with unplanned construction activities and poor sanitation facilities contributing fertile breeding grounds for mosquitoes. The present study is an attempt to describe the salient clinical as well as laboratory findings of serologically confirmed hospitalized cases of dengue fever and correlate bleeding severity with platelet count and platelet volume at the time of bleeding.

Materials & Methods: A Descriptive type of study on 100 patients who are going to get admitted as in patients in Mahatma Gandhi Medical College & Hospital with symptoms suggestive of Dengue fever such as fever, severe headache, joints pain and bleeding manifestations, shock are investigated with Dengue ELISA test. Those patients found positive for the test are included in study and informed consent is taken from all patients.

Results: Our study suggested that the majority of cases were seen in 26-35 years of age group which accounted for 45 patients. Overall male to female ratio was 2.84:1. The mean age was 40 years in males and compared to females was 39 years but statistically non-significant (p=0.7124). The mean platelet count was statistically significant (P < 0.0001***) in comparison between at time of admission (71300±36858) and at the time of discharge (162070±37000). Our study showed that the raised blood urea level, serum creatinine, serum bilirubin, MPV, SGOT & SGPT was associated with higher mortality due to dengue fever.

Conclusion: Present study has disclosed a varied clinical profile of dengue fever which is of important diagnostic tool. In the recent few years, the world has seen varied clinical presentation of the dengue fever in different epidemics, even in the same regions and even with the period of time.

Key Words: Dengue, Platelets Count, Haemorrhage, ELISA Test.

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INTRODUCTION

Dengue fever is an acute viral infection with potential fatal complications. The spread of dengue was explosive and accompanied the movement of people across continents in the early 1900's because of the slave trade and the two World Wars; India was one of the major areas affected.[1]

Recently, about 40% of the world's population is at risk and there are 50–100 million cases every year. An estimated 500 000 people with severe dengue require hospitalization each year and about 2.5% of those affected die.[2] In the last few years, dengue has re-emerged in the United States of America and has made inroads into Europe.[3] In India, dengue is widespread and endemic in most major cities.[4]

Dengue fever is typically a self-limited disease with a mortality rate of less than 1% when identify early and with access to proper medical care. The overall mortality rate of 1.2% in 2007 dropped to 0.25% in 2013. This reduction is probably the result of the cumulative effects of better patient management, increased diagnostic capabilities and better reporting. Compared with the rest of South-East Asia, the number of dengue shock syndrome (DSS) cases in India remains low. The incidence of dengue has increased dramatically in recent decades, with estimates of 40%-50% of the world's population at risk for the disease in tropical, subtropical, and, most recently, more temperate areas.[5] The rising incidence of dengue fever in India can be contributed by the rapid urbanization with unplanned construction activities and poor sanitation facilities contributing fertile breeding grounds for mosquitoes. Due to an increase in the alertness among medical fraternity following the initial epidemic and the availability of diagnostic tools in the hospital have contributed to the increased detection of cases.[6]

Dengue is a mosquito-borne viral illness caused by one of the four serotypes of the dengue virus (DENV; (DENV-1 to DENV-4) belonging to the family Flaviviridae. The virus serotypes are closely related but antigenically distinct. Dengue infections can result in a wide spectrum of disease severity ranging from an influenza-like illness (dengue fever; DF) to the life-threatening dengue hemorrhagic fever (DHF)/dengue shock syndrome (DSS), when treated, severe dengue has a mortality rate of 2%-5%, but, when left untreated, the mortality rate is as high as 20%.[7] Although the number of dengue cases has shown a constant rise with every passing year, the mortality has reduced.

According to the new terminology recommended by WHO in 2009[8] dengue cases can be classified into dengue without warning signs, dengue with warning signs (abdominal pain/persistent vomiting/mucosal bleed/increase in HCT with decrease in platelet count) and severe dengue (severe plasma leakage, severe bleeding and severe organ involvement. The exact clinical profile is important for management and prognosis. The present study is an attempt to describe the salient clinical as well as laboratory findings of serologically confirmed hospitalized cases of dengue fever and correlate bleeding severity with platelet count and platelet volume at the time of bleeding.

MATERIALS & METHODS

A Descriptive type of study on 100 patients who are going to get admitted as in patients in Mahatma Gandhi Medical College & Hospital with symptoms suggestive of Dengue fever such as fever, severe headache, joints pain and bleeding manifestations, shock are investigated with Dengue ELISA test. Those patients found positive for the test are included in study and informed consent is taken from all patients.

A detailed clinical history is taken from all patients followed by thorough clinical examination of all systems. They are further investigated with other biochemical, microbilogical, haematological, radiological investigations mentioned in study protocol.

ELIGIBILITY CRITERIA FOR SUBJECTS

Inclusion Criteria

All the adult patients with clinical features suggestive of Dengue infection, confirmed by Dengue serology (NS1) along with acute complications of dengue with derranged LFT and deranged RFT or bleeding from any site and dengue shock syndrome.

Exclusion Criteria

- Mixed infections were excluded from the study
- Chronic alcoholics were excluded from the study
- CLD cases
- ITP, TTP due to any cause
- Septicemia due to any cause

Statistical Analysis

The collective data as well as the proportions and percentages of variables are projected by appropriate charts, tables and graphs. As there is no comparative study involved, no significant statistical methods were applied.

Table 1: Age & Gender wise distribution of cases

Age group (yrs)	Male	Female	Total
15-25 yrs	6	2	8
26-35 yrs	33	12	45
36-45 yrs	10	9	19
46-55 yrs	14	1	15
>55 yrs	11	2	13
Total	74	26	100
Mean value	**39.99±13.33**	**38.92±10.25**	**P value=0.7124 NS**

Table 2: Symptoms of Dengue fever present in patients

Symptoms	Number	Percentage
Fever	100	100%
Chills & Rigor	92	92%
Myalgia	74	74%
Nausea & Vomiting	77	77%
Abdominal pain	65	65%
Headache	21	21%
Sore Throat	0	0%
Breathlessness	34	34%
Convulsions	9	9%
Rash	30	30%

Table 3: Complication of Dengue fever present in patients

Complication	Number	Percentage
Nasal bleeding	0	0%
IC bleed	1	1%
Subconjuctival hemorrhage	32	32%
Malena	32	32%
Gum bleed	1	1%
Altered sensorium	22	22%
Renal derangement	57	57%
Hepatic derangement	37	37%

Table 4: Biochemical analysis of patients

Parameters	Mean	SD
Hb. (gm%)	9.588	1.703
TLC (/dl)	7540	5026
Hematocrit value	35.94	5.944
MPV	9.971	0.6771
RBS (mg%)	102.8	32.88
Blood Urea	77.05	44.14
Blood Creatinine (mg%)	2.120	1.577
Serum bilirubin	2.244	1.294
SGOT	126.1	124.7
SGPT	100.1	107.5

Table 5: Mean Platelet count in patients

Platelet count	Mean	SD
Platelet count at time of admission	71300	36858
Platelet count at time of discharge	162070	37000
P- value	<0.0001***	

RESULTS

Results of our study suggested that total number of patient were 100 in which the majority of cases were seen in 26-35 years of age group which accounted for 45 patients (45%) of the cases, followed by 34 patients (34%) seen in 36-55 years of age, 13 patients (13%) were in more than 55 year of age and only 8 patients (8%) were seen in the age group of 15-25 years. Gender wise distribution was 74 (74%) males and 26 (26%) females and overall male to female ratio was 2.84:1. The mean age was 40 years in males and compared to females was 39 years but statistically non-significant (p=0.7124) (table 1).

In our study 100 patients (100%) had complaints of fever with chills & rigor (almost 100%) followed by nausea & vomiting in 77patients (77%), myalgia in 74 patients (74%), abdominal pain in 65 patients (65%), breathlessness in 34 patients (34%), headache was present in 21 patients (21%). And 9 patients (9%) of the patients presented with convulsions (table 2).

As a complication of Dengue fever, Our study observed that 57 patients (57%) patients had renal derangement followed by 37 patients (37%) of the patients who had hepatic derangement, 32 patients (32%) each with sub conjuctival hemorrhage & malena, 22 patients (22%) of the cases presented with altered sensorium and 1 case presented with IC bleed, out of the patients who were admitted in our hospital (table 3).

In biochemical analysis, as a consequence of Dengue fever, raised mean value of blood urea was 77.05±44.14, value of serum Creatinine being 2.120±1.577. In liver function test, the mean raised value of serum bilirubin was 2.244±1.294, SGOT was 126.1±124.7 and SGPT being 100.1±107.5 (table 4).

In our study, the mean platelet count was statistically significant (P<0.0001***) in comparison between at time of admission (71300±36858) and at the time of discharge (162070±37000) (table 5).

Our study observed that 5 patients expired out of which 2 cases were due to hepatic derangement as a complication, 2 cases were complicated by acute respiratory distress syndrome and 1 case presented with intracranial bleed which was the cause of mortality. (table 6).

Our study showed that the raised blood urea level, serum Creatinine, serum bilirubin, MPV, SGOT & SGPT was associated with higher mortality due to dengue fever (table 7).

Table 6: Outcome of patients

Outcome	Number	Percentage
Discharged	95	95%
Expired	5	5%

Table 7: Correlation between biochemical parameters in mortality cases

Parameters	Mean	SD
MPV	9.560	0.5177
Blood Urea	135.8	48.43
Blood Creatinine (mg%)	5.120	3.122
Serum bilirubin	3.880	1.401
SGOT	150.4	60.35
SGPT	116.6	48.39

DISCUSSION

Our present study included 100 cases of serologically confirmed dengue fever who were admitted to Mahatma Gandhi Medical College & Hospital, Jaipur, between May 2016 to June 2017. Mean age of the patients was 39 years.

Maximum number of patients were in the age group of 26-35 years (45%) followed by in age group 36-45 year and minimum were in the age group of >55years. Study included 74 (74%) males and 26 (26%) females. Most common presenting clinical feature was fever (100%) followed by nausea & vomiting (77%), myalgia (74%) and abdominal pain (65%). Similar results were observed in a study conducted by Agarwal A. Chandra[9] where fever was found in 100%, myalgia in 79%, headache in 76% and arthralgia in 60%.

An exclusive study on dengue shock syndrome conducted in Mumbai in 2003 reported hepatomegaly (97.4%), altered sensorium (58%), diarrhoea (50%), rash (42%), and cough (38%) in a significant number of cases.[10] This finding has also been documented in our study. Retro-orbital pain as a cardinal feature of dengue fever was seen in few (21%) of our patients. Most of the patients presented with dengue fever while dengue hemorrhagic fever and dengue shock syndrome were a minority group.

Liver enzyme elevation, a common feature in dengue infection was also apparent in our study.[11,12] A total of 45.03% patients with classical or uncomplicated dengue fever had thrombocytopenia, which is reported lower than previous study from India.[13]

The reported mortality in a study from Thailand was 1.14%,[14] while mortality rates in Martinique and India were less than 1%[15] and 2%, respectively;[16] all of these rates were lower than the 5% observed in this study but in our study mortality was in the group of dengue patients with acute complications. The presence of bleeding or clinical severity increases the indication for transfusions, and the indicators of plasma leakage and elevated transaminase levels might be related to increased mortality.

The apparent association of plasma and platelet concentrate transfusions with death requires a better evaluation because there is a possibility that these patients evolved with more severe clinical conditions that might explain the higher mortality in this group and why transfusion could not change the outcome.

CONCLUSION

In conclusion, this study has disclosed a varied clinical profile of dengue fever which is of important diagnostic tool. In the recent few years, the world has seen varied clinical presentation of the dengue fever in different epidemics, even in the same regions and even with the period of time. Where some known features are still manifesting, few atypical features are noted from several parts of the world. Continuous seroepidemiological observation and timely interventions are needed to identify the cases, so that its complications, outbreak and mortality can be minimized.

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