

Original Research Article

Study of incidence, manifestations and complications of dengue fever

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ABSTRACT

Background: Dengue is endemic in India and epidemics are common. Due to poor availability of resources, there is increased morbidity and mortality related to dengue. The objective of the research to study the incidence, manifestations and complications of dengue fever.

Methods: Patients admitted in medicine wards of a tertiary care hospital during the study period of two years with the history of fever with other nonspecific symptoms were included in the present study. Data was collected in a pre-tested proforma by meeting objectives of the present study. 100 patients who fulfilled World Health Organization criteria for dengue fever were selected by simple random sampling method.

Results: In 75 patients the platelet count was above 150000cells/cumm. Most of them had dengue fever. 12 patients showed platelet count between 20000-100000cells/cumm. and among them 10 were DHF and 2 were simple dengue infection. Five patients showed platelet count less than 20000cells/cumm. and among them 2 were DHF and 3 were DSS. Most of the bleeding skin manifestations were seen when platelet count was below 50000cells/cumm. Mucosal bleeding was observed when the platelet count was below 30000cells/cumm. Abnormal coagulation profile was noted in 18% of the patients and 6% patients were in acute renal failure. Mortality was 0% in dengue fever, 44% in DHF and 100% in DSS.

Conclusions: Platelet count was directly related to the number of complications. Dengue shock syndrome and dengue hemorrhagic fever was associated with increased mortality.

Keywords: Complications, Dengue, Incidence, Manifestation

INTRODUCTION

Almost more than 200years ago, dengue was described as “break bone fever” by Benjamin Rush. Now occupied the front seat, dengue is the centre focus of attraction of public health problems. It is a viral infection transmitted by mosquito.

The most common clinical form is dengue fever which is self-limiting. But few cases may develop dengue shock syndrome or dengue hemorrhagic fever which is associated with increased morbidity and mortality.

The disease is characterized by absence of specific vaccine or specific drugs. Only supportive management is available. 2.5billion Population is exposed to the risk of dengue globally. It has been estimated that around 50 cases occurred. Among them more than 20,000 died. Maximum cases are recorded in the pediatric population.¹

Dengue is endemic in India and epidemics are common. Due to poor availability of resources, there is increased morbidity and mortality related to dengue. This endemicity is attributed to the increased mosquito breeding.²

Most commonly adults are affected by dengue, but the pediatric population is more vulnerable. Occurrence of myalgia, fever, hemorrhage, arthralgia, and headache are common presenting features with which the patients present to the outpatient departments of the hospital.³

Dengue fever is classical and mild and self-limiting. Platelet count falls initially but then after week's symptoms, the patient shows recovery. This classical dengue fever is due to infection by single serotype of the virus. Mixed infection by more than one serotype of the virus causes more severe form of dengue fever i.e. DHF or DSS. In recent days, the dengue virus is showing the changes in the characteristics of the virus. This is leading to the more and more number of patients having neurological complications. This may be due to complications of systemic nature resulting in stroke, encephalopathy and paralysis due to hypokalemia. This can also be attributed to affinity of the new dengue virus towards the neurons which results in meningitis, encephalitis, myelitis and Myositis. The virus may be disturbing the immune system leading to autoimmunity and resulting in the Guillaine Barre syndrome, and acute disseminated encephalomyelitis and optic neuritis.⁴

Most of the cases are classical dengue fever and are self-limiting. Some land into complicated forms like DSS or DHF. There is thrombocytopenia as well as the vascular permeability is increased. Due to increase in the vascular permeability, bleeding manifestations occur. Due to increased and neglected bleeding the patient may land up in the shock. With timely management in the good resource settings the mortality rate can come down to less than one percent. But in countries like India, lack of well-equipped hospitals leads to increased complications among patients are common.⁵

Hence present study was carried out to study incidence, manifestations and complications of dengue fever.

METHODS

Patients admitted in medicine wards of a tertiary care hospital during the study period of two years with the history of fever with other non-specific symptoms were included in the present study. Data was collected in a pre-tested proforma by meeting objectives of the present study. 100 patients who fulfilled World Health Organization criteria for dengue fever were selected by simple random sampling method. This method of sampling is a scientific method of sampling and used in the present study. This scientific method of sampling i.e. simple random sampling ensures that the data becomes representative of the hospital population and can be applied to the whole population. The clinical history, physical findings and laboratory investigations that help in diagnosis of dengue fever were analyzed and recorded.

Inclusion criteria

Fever acute onset high degree continuous lasting for 2-7days with associated symptoms specific to dengue fever such as headache, myalgia, retro orbital pain and arthralgia with significant elevation of IgM anti dengue antibodies by MAC-ELISA (which is internationally accepted).

Fever thrombocytopenia with hemorrhagic manifestations like petechiae, purpura, ecchymoses, epistaxis, gum bleeding, gastro intestinal bleeding and sometimes intra cerebral bleeding.

All patients were subjected to routine investigations like hemoglobin percentage, total and differential white blood cell count, erythrocyte sedimentation rate, urine routine examination, stool microscopy, random blood sugar, blood urea and serum creatinine, chest X ray, platelet count, serum electrolytes, ultra-sonography of the abdomen, liver function tests, electro cardio gram, detection of anti-dengue IgM antibodies, cerebrospinal fluid analysis and if required computed tomography scan was performed.

All data was entered in the Microsoft Excel Worksheet and analyzed using proportions. Appropriate statistical test was applied at places in the results section if required for the present study.

RESULTS

Table 1: Distribution of cases based on platelet count.

Platelet count	Frequency	%	Cumulative percentage
< 10000	2	2	2
10000-20000	3	3	5
20000-30000	9	9	14
30000-40000	2	2	16
90000-100000	1	1	17
110000-120000	1	1	18
120000-130000	2	2	20
130000-140000	1	1	21
140000-150000	4	4	25
> 150000	75	75	100
Total	100	100	

75 among 100 cases of dengue infections, in 75 patients the platelet count was above 150000cell/cumm. Most of them had dengue fever. 12 patients showed platelet count between 20000-100000cells/cumm. and among them 10 were dengue hemorrhagic fever and 2 were simple dengue infection. Five patients showed platelet count less than 20000cells/cumm. and among them 2 were dengue hemorrhagic fever and 3 were dengue shock syndrome.

Table 2: Bleeding manifestations depending upon the platelet count.

Platelet count	Purpura	Petechiae	Ecchymoses	Epistaxis	Gum bleeding	Hematemesis	Malena	Hematuria
< 10000	6	6	6	6	6	2	2	5
10000-20000	6	7	5	6	6	3	3	7
20000-30000	4	3	2	3	2	0	0	2
30000-40000	1	1	0	0	0	0	0	0
40000-50000	0	0	0	0	0	0	0	1
50000-100000	14	2	0	0	0	0	0	0
100000-150000	0	0	0	0	0	0	0	0

Most of the bleeding skin manifestations such as purpura, petechiae, ecchymoses, and epistaxis were seen when platelet count was below 50000 cells/cumm. Mucosal bleeding (epistaxis, gum bleeding, hematemesis, malena and hematuria) were observed when the platelet count was below 30000 cells/cumm.

Table 3: Complications of dengue fever.

Complications	Number
Hepatic dysfunction	17
Acute renal failure	6
Acute respiratory distress syndrome	4
Abnormal coagulation profile	18

In the present study, 17 patients had hepatic dysfunction who improved after fluid resuscitation and abnormal coagulation profile was noted in 18% of the patients and 6% patients were in acute renal failure who improved after fluid resuscitation without dialysis. 4% patients developed acute respiratory distress syndrome. But none of them survived in spite of possible treatment.

Table 4: Dengue and its manifestations.

Manifestation	Number	Mortality
Dengue fever	88	0
Dengue hemorrhagic fever	9	4
Dengue shock syndrome	3	3

In the present study among 100 cases 88 were of dengue fever with no mortality. 9 cases were of dengue hemorrhagic fever with 4 deaths (44%). There were 3 cases of dengue shock syndrome and all of them died.

Table 5: Distribution of study subjects as per treatment received.

Treatment received	Number of cases
IVF	100
PCT	100
PRP	12
BT	12
Steroids	32

In the present study, all the patients with dengue fever and its manifestations that are DHF and DSS were received paracetamol and intravenous fluids. The patients with bleeding manifestations and platelet count less than 50000 cells/cumm were received PRP, steroids and sometimes fresh blood transfusion if severe bleeding manifestations were noted.

DISCUSSION

75 among 100 cases of dengue infections, in 75 patients the platelet count was above 150000cell/cumm. Most of them had dengue fever. 12 patients showed platelet count between 20000-100000cells/cumm and among them 10 were dengue hemorrhagic fever and 2 were simple dengue infection. Five patients showed platelet count less than 20000cells/cumm and among them 2 were dengue hemorrhagic fever and 3 were dengue shock syndrome. Most of the bleeding skin manifestations such as purpura, petechiae, ecchymoses, and epistaxis were seen when platelet count was below 50000cells/cumm. Mucosal bleeding (epistaxis, gum bleeding, hematemesis, malena and hematuria) were observed when the platelet count was below 30000cells/cumm.

In the present study, 17 patients had hepatic dysfunction who improved after fluid resuscitation and abnormal coagulation profile was noted in 18% of the patients and 6% patients were in acute renal failure who improved after fluid resuscitation without dialysis. 4% patients developed acute respiratory distress syndrome. But none of them survived in spite of possible treatment. In the present study among 100 cases 88 were of dengue fever with no mortality. 9 cases were of dengue hemorrhagic fever with 4 deaths (44%). There were 3 cases of dengue shock syndrome and all of them died.

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Kumar A et al in their study observed that majority cases were adults and males.⁶ Fever was reported in 99.1% of the cases. Myalgia was seen in 64.6% of the cases. This was followed by vomiting in 47.6% of the cases and headache in the same number of cases. Abdominal pain was the least seen in 175 cases. Petechiae were seen in 84 cases which is a bleeding manifestation. Majority i.e. 84% had classical dengue fever. Dengue hemorrhagic fever was seen only in 8.8% of the cases and 7.3% had dengue shock syndrome. Overall 14% were found to have developed complications. Among them, acute respiratory distress syndrome was seen in 33.3% of the cases while pleural effusion was seen in 30% of the cases. Mortality rate was 2.4% which is lower than that found in the present study. The author suggested preventive measures like proper treatment of the cases and awareness among community to reduce the cases.

Verma R et al in their study included 26 patients who developed neurological complications due to dengue over a period of two years of their study period.⁷ Majority were males. Brachial neuritis was seen 10 patients. Encephalopathy was found in four cases. Guillaine Barre syndrome was noted in three cases. Hypokalemic paralysis was observed in three cases. The author concluded that neurological complications are common and severe in dengue. "Brachial neuritis and opsoclonus-myoclonus syndrome" were the new finding of this author study.

Murray NEA et al reported that it is difficult to comment on the exact impact of dengue.⁸ This is due to improper diagnosis, lack of proper and adequate reporting and improper surveillance of disease. Hence true dengue data underestimates the disease burden. Vector management is the important point to control the dengue. Pal S et al found that neurological complication was seen in 9 cases.⁹ Among them, two cases developed encephalopathy. Encephalitis was seen in five cases. Meningitis was seen in one case. The author concluded that dengue can have a variety of central nervous system presentations. The author recommended that dengue should be included in the list of differential diagnosis of acute encephalitis syndrome.

Verma R et al described the epidemiology of dengue.¹⁰ They observed that myelopathy, encephalopathy, Guillaine Barre syndrome, stroke and hypokalemic paralysis are the common neurological complications of the dengue. The author described the three patients with brachial neuritis due to dengue which was not described earlier. The authors suggested considering the inclusion of dengue as differential diagnosis of the brachial neuritis especially in the dengue epidemic areas.

CONCLUSION

Platelet count was directly related to the number of complications. As the platelet count decreased, the rate of complications increased. Patients with low platelet count were having more complications than patients with higher platelet count. Dengue shock syndrome and dengue hemorrhagic fever was associated with increased mortality.

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