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Research Article

Clinical profile and outcome of dengue fever and dengue haemorrhagic fever in pediatric age group

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ABSTRACT

Background: Dengue infection, an arthropod-borne viral hemorrhagic fever, continues to be a major challenge to public health, especially in South-East Asia. We have done an observational study of dengue and dengue hemorrhagic fever in which we have studied the clinical pattern of dengue presentation.
Methods: This study was conducted in the CICU and PICU of SCB medical college, Cuttack, Odisha, India. 100 patients, serologically dengue positive were included in this study. Hematological and other clinical parameters were evaluated. Statistical analysis was done after estimating p-value.
Results: Fever, vomiting, abdominal pain, hepatomegaly, bleeding diathesis and hypotension were common clinical symptoms. Serological tests, hematocrit, platelet counts, liver enzymes and abdominal ultrasonography and fluid therapy were useful in management of all cases.
Conclusions: Patients presented with variable symptoms both in dengue fever and dengue hemorrhagic fever in pediatric age group.

Keywords: Dengue, Fever, Hemorrhagic, Pediatric

INTRODUCTION

Dengue infection, an arthropod-borne viral hemorrhagic fever, continues to be a major challenge to public health, especially in South-East Asia.[1] It has a wide geographical distribution and can present with a diverse clinical spectrum.[2] It has been estimated that at least 2.5 billion people worldwide live in areas where there is a significant risk of infection from the dengue virus.[3] Estimates suggest that annually over 50 million cases of dengue hemorrhagic fever (DHF) occur in Asian countries with a case fatality rate of less than 5%[3]. Of those with DHF, at least 90% are children younger than 15 years old.[3] We have done an observational study of dengue and dengue hemorrhagic fever in which we have studied the clinical pattern of dengue presentation.

METHODS

This study was conducted in the CICU and PICU of SCB medical college, Cuttack, Odisha, India. Patients with serologically confirmed dengue from 1 yr age to 16 years were included in this study. The period of study was from June 2014 to May 2015. 100 patients were included in this study. Patients were enrolled after obtaining written consent from parents. Patients with enteric fever, Rickettsial fever, malaria, leptospirosis, septicemia and viral hemorrhagic fever other than dengue were excluded from this study. Detailed clinical examination was done. Laboratory parameters like serial hemoglobin estimation, serial hematocrit, platelet counts, liver function tests, abdominal sonography, chest, X-ray, serology tests for dengue: NS1 Antigen, IgG and IgM antibody were done.

According to WHO 2012 classification, they were classified as dengue, dengue fever with warning signs and severe dengue.[4]

Symptomatic treatment was done for fever. Fluid management was done according to WHO 2012 fluid management guidelines. During the treatment period monitoring charts for vital parameters were used. Isotonic saline was used for initial management. Intravenous fluids were discontinued after patient became hemodynamically stable. Analysis was done using Microsoft Excel and P values <0.05 were considered significant.

RESULTS

100 children were included in this study. There was a seasonal incidence from September to November, which was the post monsoon period. Average number of days for admission was 8-10 days. The most prevalent symptoms of dengue were fever, vomiting, rash, abdominal pain and bleeding diathesis. History of fever was elicited in 100% of cases (p value 0.000). The next common symptom was abdominal pain and vomiting. Table 1 here illustrates the symptomatology.

Table 1: Symptoms of dengue.

Symptoms	Numbers of cases	Percentage
Fever	100	100
Abdominal pain	90	90
Vomiting	74	74
Bleeding diathesis	27	27
Rash	25	25

45% had fever at admission. Hypotension with low pulse volumes were found in 65% of patients. 90% of patients had hepatomegaly. Poor tissue perfusion was found in 19% of cases as indicated by prolonged capillary refill time (CRT). Bleeding diathesis in form of petechiae, epistaxis, positive tourniquet, hematemesis was found in 55% of cases. Third space losses (pleural effusion and ascites) was found in 25% of cases (Table 2).

Table 2: Clinical signs of dengue.

Signs	Number of cases	Percentage
Fever at admission	45	45
Hypotension with Low pulse volume	65	65
CRT >3	19	19
Bleeding diathesis	55	55
Hepatomegaly	90	90
Free fluid (ascites, pleural effusion)	25	25

There was no statistically significant difference in any of the investigations (p value 0.245). Hemoconcentration was evident by increased hematocrit, was seen in 100% of patients. Thrombocytopenia was seen in 94% of cases. Sonographic evidence of hepatomegaly was seen in 90% of cases. Plasma leakage in the form of ascites and pleural effusion was found in 25% of cases. For evidence of dengue, NS1 antigen was the most common evidence, 94% has NS1 positive, 24 cases were positive for IgG. 28 cases were positive for IgM (Table 3).

Table 3: Investigations in dengue.

Investigations	Number of cases	Percentage
Hemoconcentration	100	100
Thrombocytopenia	94	94
AST/ALT elevation	97	97
Sonographic evidence of hepatomegaly	90	90
Sonographic evidence of free fluid	25	25
NS1 Antigen	88	88
IgG	24	24
IgM	28	28

According to revised classification of WHO in 2012, Dengue without warning signs constituted to 5% of cases. Dengue with warning signs constituted 35% of cases. Sever Dengue constituted 60% of cases. All the patients were administered parenteral fluids along with supportive management. Monitoring charts were maintained. The parenteral fluids used in our study were (0.9%) normal saline.100% of cases were treated with 0.9% NS. The mortality was 10%. Those patients had presented with multi organ dysfunction with renal failure, pulmonary edema and encephalopathy.

DISCUSSION

Dengue has a wide clinical spectrum that includes both severe and non-severe manifestations. After incubation period, the illness begins abruptly and is followed by three phases febrile, critical and recovery.[4]The characteristics studied were age, sex and seasonal incidence, number of days of admission, clinical symptoms, clinical signs and investigations. In our study the youngest child was 1year old and the oldest was 16 years old. There was a distinct higher incidence in older age group above 10 years accounting for 60% of the total cases. There was a male preponderance in our study. The male to female ratio was 2:1. This was statistically significant (p value 0.004). 95% of cases needed admission in pediatric/central intensive care unit. A seasonal pattern was observed, 18% of cases were in June to August, 60% of cases were from September to November, 10% of cases were from December to February and 10% of cases were from March to May. Highest incidence occurred during the monsoon and post monsoon season. Wongkoon S, et al have also described seasonal pattern of dengue which corresponded with the rainy season due to abundance of mosquito breeding in the season.[5]

History of fever was present in all cases. Abdominal pain was the next common symptom in our study. Agarwal, et al in their study from Delhi, have also noted fever, abdominal pain and vomiting as the commonest symptoms.[6] The commonest hemorrhagic manifestation was hematemesis and epistaxis which was similar in our study. Similar observations were noted in other studies too.[7-9] The clinical signs which were studied were fever at admission, low pulse volume, hypotension, prolonged capillary refill time >3 seconds. Bleeding diathesis, hepatomegaly, and signs of fluid leakage like ascites and pleural effusion were studied. Through 100% of cases had history of fever, only 45% of our cases had fever at admission. Hypotension with low pulse volume was noted in 65% of cases. 19% of cases had CRT >3 second indicating poor tissue perfusion. 90% of cases had hepatomegaly. Similar observation has also been made in other studies.[10-12] Hemoconcentraion, thrombocytopenia, abnormal liver function tests in the form of elevated transaminases, ultrasonographic evidence of hepatomegaly along with ascites and/or pleural effusion and gall bladder wall edema were noted. NS1 antigen was found in 88% of cases. Dengue IgM antibodies in 28% of cases and IgG in 24% of cases. Previous studies have also reported similar findings.[13,14] There was no correlation between platelet counts and bleeding manifestations. In our study too, though thrombocytopenia was found in 95% of cases, only 55% of cases had bleeding manifestations.

WHO in their 2012 Handbook on management of dengue, have described stepwise approach to the management of dengue, where only isotonic solutions have been advised, followed by serial monitoring of clinical status, fluid balance and hematocrit. Judicious fluid resuscitation was advised to maintain effective circulation during the leak period. Crystalloids were preferred over colloids. In our study of 100 cases of dengue, we found 90% made a complete recovery from illness. There was 10% mortality.

CONCLUSION

Dengue infection is a systematic and dynamic disease. It has a wide clinical spectrum that includes both severe and non-severe manifestations. After incubation period, the illness begins abruptly and is followed by three phases febrile, critical and recovery. A high index of suspicion for early diagnosis, monitoring and prompt fluid management and supportive treatment as per WHO guideline can reduce mortality in patients of severe dengue.

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