



Case Report

A Retrospective Study of Pediatric Dengue Cases in a Sadan Institute of Medical Science

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Abstract:

Background: Dengue fever causes a high burden of disease and mortality across tropical and subtropical regions in Southeast Asia, Africa, the Western Pacific, and the Americas. It is the most extensively spread mosquito borne disease, endemic in more than 100 countries. The present study was conducted to determine dengue fever in children reported to tertiary care centre.

Methods: 60 reported cases of dengue fever in children of both genders were diagnosed based on detection of DENV NS1 antigen ELISA, anti-JEV- and anti DENV- specific IgM antibodies in serum samples. Clinical and laboratory features were recorded.

Results: ICU admission was seen in 45, average ICU days was 4.2 days, number of days of fever was 4.5, fever was present in 60, rashes in 45, headache in 36, vomiting in 24, respiratory distress in 30, pain abdomen in 54 and loose stools in 32. The difference was significant ($P < 0.05$). The mean hematocrit (%) was 34.6, platelets (per 103 / μ l) was 2.64, white blood cells (per 103 / μ l) was 9.12, neutrophils was 5.02, lymphocytes was 2.13, urea (mmol/L) was 4.12, creatinine (μ mol/l) was 68.4, alanine transaminase (IU/l) was 76.5, urine protein (mg/dL) was 12.5 and urine red blood cells was 2.1.

Conclusion: Dengue fever is common in children, Assessment of laboratory tests may be helpful in early detection and prompt management of cases.

Keywords: Dengue, Headache, Platelets, DHF, DENV

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Introduction

Dengue fever causes a high burden of disease and mortality across tropical and subtropical regions in Southeast Asia, Africa, the Western Pacific, and the Americas.[1] Dengue virus comprises five serotypes, DENV-1, DENV-2, DENV-3, DENV-4 and DENV-5, which are transmitted by Aedes aegypti mosquitoes.

An estimated 2.5 billion people worldwide are at risk of dengue.[2] More than 50 million dengue infections are estimated to occur annually, of which approximately 500,000 result in hospital admissions for severe dengue in

the form of dengue haemorrhagic fever (DHF) or dengue shock syndrome (DSS), principally among children.[3]

The first dengue fever in India was reported during 1956 from Vellore and the first dengue haemorrhagic fever occurred in Calcutta in 1963. In India the annual incidence is estimated to be 7.5 to 32.5 million.[3] In Odisha, a state of Eastern India, the first outbreak was reported in 2010, followed by extensive outbreaks in 2011, affecting a large number of people.[4]

Among symptomatic dengue cases a wide variety of clinical manifestations are seen, ranging from mild febrile illness to severe and potentially fatal disease.[5]

Only a small proportion of patients progress to more severe disease, typically manifesting with a transient systemic vascular leak syndrome around the time of defervescence; plasma leakage occurs, usually accompanied by altered haemostasis and thrombocytopenia. Leakage may be profound, particularly in children, sometimes resulting in life-threatening dengue shock syndrome (DSS).[6] Other severe complications, such as severe liver, cardiac or neurological involvement, may also occur but are less frequent. With expert supportive care mortality rates have been reduced to very low levels, in many centres of excellence down to less than 1 % for those with severe disease.[7] The present study was conducted to determine dengue fever in children reported to tertiary care centre.

Materials and Methods

The present study comprised of 70 reported cases of dengue fever in children of both genders. All were enrolled after obtaining written consent from their parent. Inclusion criteria were age < 16 years, documented axillary temperature ≥ 38.0 °C within 48 h of admission.

Data such as name, age, gender etc. was recorded. A thorough clinical examination was performed. Dengue diagnosis was based detection of DENV NS1 antigen ELISA, anti-JEV- and anti DENV-specific IgM antibodies in serum samples and in cerebrospinal fluid (CSF) specimens. Laboratory test comprised of haematocrit, platelet counts, white blood cell (WBC) counts, urea, creatinine, and alanine aminotransferase (ALT) results, and the presence of urinary protein or red blood cells (RBC). Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table 1: Distribution of patients Total- 60

Gender	Number
Boys	30
Girls	30

[Table 1] shows that out of 60 patients, boys were 30 and girls were 30.

Table 2: Assessment of parameters

Parameter	number	P value
ICU admission	45	-

ICU days	4.2	-
No . of days of fever	4.5	-
fever	70	0.041
rash	45	
headache	36	
Vomiting	24	
Respiratory distress	30	
Pain abdomen	54	
Loose stools	32	

[Table 2] shows that ICU admission was seen in 45, average ICU days was 4.2 days, number of days of fever was 4.5, fever was present in 60, rashes in 45, headache in 36, vomiting in 24, respiratory distress in 30, pain abdomen in 54 and loose stools in 32. The difference was significant (P< 0.05)

Table 3: Assessment of laboratory parameters

Parameters	Mean
Hematocrit (%)	34.2
Platelets (per 103 / μ l)	2.64
White blood cells (per103 / μ l)	9.12
Neutrophils	5.02
Lymphocytes	2.13
Urea.	4.12 (mmol/L)
Creatinine (μ mol/l)	68.4
Alanine transaminase,	76.5IU/l
Urine protein mg/dL	12.5

[Table 3] shows that mean hematocrit (%) was 34.2, platelets (per 103 / μ l) was 2.64, white blood cells (per103 / μ l) was 9.12, neutrophils was 5.02, lymphocytes was 2.13, urea (mmol/L) was 4.12, creatinine (μ mol/l) was 68.4, alanine transaminase (IU/l) was 76.5, urine protein (mg/dL) was 12.5 and urine red blood cells was 2.1.

Discussion

Dengue is an arboviral disease caused by infection with any one of four related dengue virus (DENV) serotypes.8 It is currently the most important mosquito-borne viral pathogen affecting humans, and is emerging as a major threat to global health. Best estimates indicate that some

3 billion people live in parts of the world where they are at risk of infection and that around 96 million symptomatic episodes and approximately 20,000 deaths occur each year.[6] As yet, neither vaccines nor specific therapies are available although both areas are currently the focus of intense research efforts.[10] According to the WHO the case fatality rate for dengue is roughly 5%. *Aedes albopictus* was found to be the most abundant vector in the areas surveyed, followed by *Aedes aegypti*. DENV-2 is the prevailing serotype.[11] The case fatality rate in patients with severe dengue infection which consists of dengue haemorrhagic fever (DHF) and dengue shock syndrome (DSS) can be as high as 44%.[12] The present study was conducted to determine dengue fever in children reported to tertiary care centre.

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Table 3: Assessment of laboratory parameters

Parameter	mean
hematocrit	34.6%
Platelets	2.64
wbc	9.12
neutrophil	5.02
lymphocytes	2.13
urea	4.12
creatinine	68.4
Alanine transaminase	76.5
Urine protein	12.2
Urine redblood cells	2.1

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In present study, out of 60 patients, boys were 30 and girls were 30. Phakhonthong et al,[13] in their study there were 3225 patient admissions during the study year, of which 1361 (42.2%) met the inclusion criteria. Of these, 136 (10.0%) were not enrolled, leaving 1225 febrile episodes in 1180 children, with 1144 children having a single episode, 31 children having two episodes, one child having three episodes, and four children having four episodes. The patients were mainly diagnosed as having lower respiratory tract infection (38.3%), undifferentiated fever (25.5%), or diarrhoeal disease (19.5%). Out of 1180 enrolled children, there were 69 deaths, the causes of which were: clinical pneumonia with no organism/virus identified (12 cases, 27.5%), dengue virus infection (. 941 non- dengue episodes and 86 episodes with no samples available were excluded from this analysis. Further details can be found in the original report. Out of 198 confirmed dengue episodes, 43 episodes required ICU admission, with 29 of those classified as severe dengue based on their clinical signs, supported by two independent clinical opinions. Nine additional severe dengue episodes were included from non-ICU admissions, making a total of 38 episodes of severe dengue.

We observed that ICU admission was seen in 45, average ICU days was 4.2 days, number of days of fever was 4.5, fever was present in 60, rashes in 45, headache in 36, vomiting in 24, respiratory distress in 30, pain abdomen in 54 and loose stools in 32. Kumar et al,[14] in their study there were 52% of the cases of dengue fever, 16.6% of cases were dengue fever with warning signs and remaining 31.4% of patients were severe dengue. Common Clinical symptoms at admission were fever (100%), vomiting (77%), respiratory distress (56.25%), generalised weakness (54.1%) and pain abdomen (33.3%). Less common symptoms were loose stools (6.25%), periorbital puffiness (6.25%), altered sensorium (4.1%), oliguria (2%) and bleeding manifestations (2%). Out of these dengue children 70.8% of these children improved without complication, 20.8 % of children improved with complication, in the form of ARDS, acute liver failure, DSS, meningitis, 6.25 % of these children went DAMA and 2 % of children expired.

Tamibmaniam et al,[15] used simple logistic regression and identified three parameters, including vomiting, pleural effusion, and low systolic blood pressure, to predict severe dengue based on the 2009 WHO criteria. This study did not specifically focus on children and included only female patients. The sensitivity and specificity achieved in its decision algorithm were 81% and 54%, respectively.

Conclusion

We have found that dengue fever is common in children, and endemic in India. Assessment of

laboratory tests may be helpful in early detection and prompt management of cases.

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