International Journal of Contemporary Pediatrics
Vinaykumar SA et al. Int J Contemp Pediatr. 2024 Apr;11(4):419-422
http://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291

DOI: https://dx.doi.org/10.18203/2349-3291.ijcp20240730

Original Research Article

The study of clinical profile of severe dengue in children

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Received: 12 February 2024
Revised: 11 March 2024
Accepted: 12 March 2024

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ABSTRACT

Background: Dengue fever is one of the most important vectors borne viral diseases, causing the significant burden due to high admissions and mortality in southern parts of India. Early detection and early intervention of sickness can reduce this burden for which we should know the clinical features and other parameter in dengue so that mortality rate can be reduced.
Methods: It was a retrospective single center study which included patients admitted to department of pediatrics from a period of October 2022 to November 2023. A total of 30 cases of severe dengue admitted in a span of 6 months. A detailed clinical and laboratory data was recorded in a questionnaire format which was analyzed using statistical tool.
Results: Among 30 cases of severe dengue the most common clinical feature was shock (53%), hepatitis (36%), clinical fluid accumulation (33%), mucosal bleeding (26%) and ARDS (165). Severe dengue was frequently found in the range of white cell count 1000-4000/ul and platelet count 12000-50000/ul.
Conclusions: The key to the management of severe dengue illness lies in the in-depth knowledge of clinical manifestation among children. Thus, it is important to be aware of warning signs and varied presentations of severe dengue so that there will be accurate management of in resource limited setups.

Keywords: Severe dengue, Warning signs, Shock

INTRODUCTION

Dengue viral infection is one of the most common vectors borne disease globally. Among the 100 million cases of dengue fever in a year half a million cases were labeled as severe dengue infection.[1,8] Dengue is a acute febrile disease caused by flavi virus with 4 known serotypes DEN V1, V2, V3, V4. The 4 serotypes can lead to spectrum of clinical presentation ranging from asymptomatic to severe form.[2,5]

Children represent more peculiar characteristics since dengue diagnosis and recognition of severe form are both more difficult to find than in the adults. Common signs and symptoms are fever, headache, myalgia, arthralgia, rashes and bleeding manifestations which will be cofounded in various other viral febrile illnesses. During early stages due to presence of non-specific clinical pictures making a precise clinical diagnosis is difficult resulting in inefficient treatment and raising probability of mortality and morbidity.[3,4,7] In remote rural areas due to lack of necessary lab facilities difficulty in diagnosis of dengue is enhanced leading to rapid death in children.[5,6,8] True incidence of burden of disease remains under reported due to above said hurdles in diagnosis of it.

Study was done, where data is analyzed and interpreted with appropriate statical methods, to aid in quick and simple clinical analysis of severe dengue at the earliest.

METHODS

Study design and sample

This was a retrospective single center study. It was conducted in children <15 years of age, who were

diagnosed as dengue infection and treated as severe dengue according to the WHO protocol from a period of October 2022 to November 2023 at Vijayanagar institute of medical sciences, formerly Bellary medical college, Karnataka. Statistical analysis done using SPSS version 13.0 used for data analysis. Data analyzed by frequency, percentage, mean (±SD)/median (Inter quartile range-IQR). Approval was obtained from the institutional ethics committee of the medical college. The following simple formula used for calculating the sample size $n=Z^2 P (1-P)/d^2$ Where n is sample size, Z is statistic corresponding to level of confidence, p is prevalence and d is precision. The level of confidence usually aimed is 95%.

Inclusion criteria

Children with dengue fever, dengue hemorrhagic fever and dengue shock syndrome with serological confirmation of NS1, Ig M and Ig G were included.

Exclusion criteria

Children with hemorrhagic disease, dengue serology negative and children with chemotherapy were excluded.

Demographic data comprises of name, age, sex, weight, temperature, duration of fever, headache, retro-orbital pain, skin redness, petichea, shortness of breath, abdominal pain, nausea, persistent vomiting, oedema, ascitis, mucosal bleeding, severe bleeding, liver enlargement, signs of shock. Investigations monitored are hematocrit, platelet, white cell count, AST or ALT levels, organ impairment such as heart, kidneys and chest x-ray. The gold standard of dengue infection is clinical symptoms, laboratory and serological confirmation of IgG, IgM and or NS1. All data parameters are analyzed using SPSS statistics software. Ethical committee approval taken from institutional ethical committee.

RESULTS

A total of 30 cases were classified as severe dengue and treated among the 220 dengue cases admitted from a period of October 2022 to November 2023. All the cases fulfilled the inclusion and exclusion criteria.

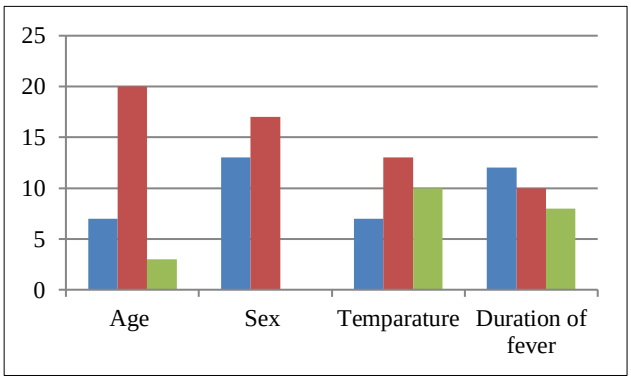

Figure 1: Patients characteristics.

Majority of the cases (60%) were in the age group of 5-10 years and more common in female than male. Most common manifestation of severe dengue were abdominal pain (70%), fever (66), vomiting (60%), bleeding manifestation (30%), body ache (26%), headache (20%), anorexia (13%), retroorbital pain (06%), dizziness (06%), rashes (10%), cough, cold, throat pain (13%), loose stools (06%), conjunctival congestion (06%), convulsions (06%), breathing difficulty (04%), chest pain (03%).

This study showed that 07 (23%) cases were found to have pleural effusion on chest x-ray. Among liver enzymes SGOT and SGPT were elevated in 11 (36%) cases. Platelet count was less than 10,000/mm^3 in 7 (23%) cases.

Warning signs abdominal pain, persistent vomiting, clinical fluid accumulation, mucosal bleeding, hepatomegaly and lethargy were persistently associated with severe dengue.

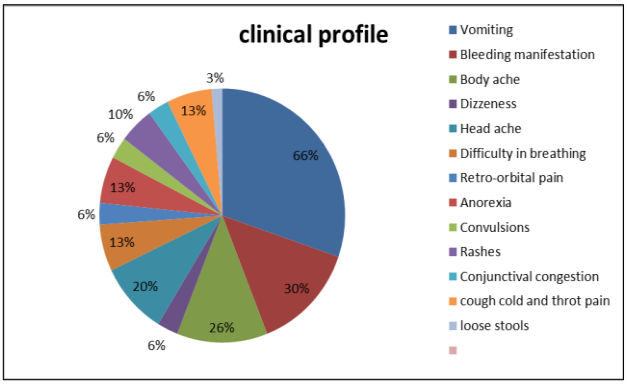

Figure 2: Clinical profile.

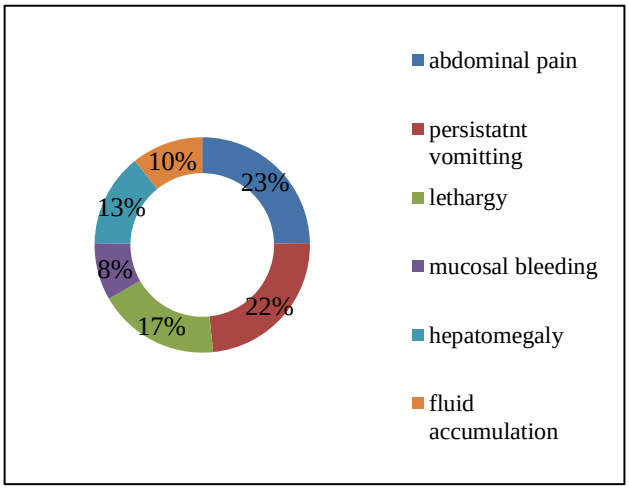

Figure 3: Warning signs distribution

Table 1: Outcome, (n=30).

Outcome	N	Percentages (%)
Discharged	25	84
Dead	05	16

DISCUSSION

The common age of the severe dengue was 5-10 years among the 30 cases studied. Days of illness was the count from the first day of febrile symptoms appeared in the child. A guideline from WHO showed the critical phase of dengue infection commonly started from day 4-6 when severe plasma leakage usually started. In this study the children with severe dengue were admitted on 4-5th day of febrile illness similar to the study by Ledika et al.[9] The most common presentation was vomiting (66%), bleeding manifestation (30%), body ache (26%), headache (20%) in the cases which presented with severe dengue. Abdominal pain, vomiting, lethargy, fluid accumulation and mucosal bleeding were the common warning signs present in cases of severe dengue. Radiological markers such as chest x-ray and abdominal ultrasound can predict plasma leakage significantly in children with warning signs of severe dengue. This study reported that 07 (23%) cases were found to have pleural effusion by chest X-ray similar to the study done by Ravishankar et al.[10]

Parameters like SGOT, SGPT were found abnormal (increased) in severe dengue similar to the study done by Mishra et al value of >500 IU/L. This rise in SGOT and SGPT was associated with high morbidity and mortality.[11] Low platelet value at admission had associated with severe dengue spectrum. Low platelet count was frequently found in the range of 20,000-50,000mm/ul in all cases of severe dengue. However, there were 07 (23%) cases of severe dengue of platelet <10,000/ul. Mishra et al reported that platelets <50,000/ul was associated with severe dengue infection. While Jagdeesh et al reported that in most cases with severe dengue the platelet value was <20,000/ul.[12] In this study the white cell count was in the range of 1000-4000/ul in cases of severe dengue similar to the study done by Srinivas et al.[13] Previous studies have shown that modified definitions of dengue disease severity have better agreement with a treating physician's assessment when compared to strict adherence to WHO criteria.[14-17]

In the line of management all cases needed IV fluids, about 30% required colloids and hypertonic fluids. About 54% needed inotropes. Mortality rate was about 18% (05 cases).

Limitations

The number of participants or observations in the study may be too small to draw conclusions. Further studies are needed.

CONCLUSION

This study concluded that manifestation of severe dengue infection is different among children. Most common manifestation of severe dengue were fever, abdominal pain, shock, mucosal bleeding, clinical fluid accumulation, shortness of breath, vomiting, petechiae, organ impairment and myalgia. The results of SGOT, SGPT and platelet count and white cell count was found to aid in prognosis of the disease. The key to the management of severe dengue illness lies in the in-depth knowledge of clinical manifestation among children. Thus, it is important for the pediatrician to be aware of warning signs and varied presentations of severe dengue so that there will be accurate management in resource limited setups.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Vinaykumar SA, Chandrasekhar G, Vinaykumar S. The study of clinical profile of severe dengue in children. Int J Contemp Pediatr 2024;11:419-22.