

“CLINICO-RADIOLOGICAL PROFILE AND OUTCOME OF DENGUE FEVER IN CHILDREN IN TERTIARY CARE CENTRE”

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Abstract

Background and objectives: Dengue, important arbo viral infection transmitted by *Aedes aegypti* to a lesser extent, *Ae. albopictus*. There are 4 distinct, but closely related, serotypes of the virus that cause dengue (DEN-1, DEN-2, DEN-3 and DEN-4). There is increasing prevalence in tropical and subtropical countries in the recent times. This study was done to know the spectrum of various clinical manifestations of DF and radiological profile among dengue cases.

Materials and methods: This descriptive observational study was carried out in the department of Pediatrics, Government Medical College/Government General Hospital, Nizamabad, Telangana State during October 2017 to November 2018.

Results: Out of 106 cases examined, majority (63.2%) were in the age group of 6 – 10 yrs. Male to female ratio was 1.35:1. Fever was present in almost all cases i.e. 99%. Bleeding manifestations were noted in 53% cases. On ultrasound, hepatomegaly was found in most (35.8%) cases, followed by gallbladder wall edema (26.4%).

Conclusion: The wide varied presentation of dengue fever especially in children is very unpredictable. Knowing the scope of atypical manifestations, every case with fever, in endemic areas, should be thoroughly examined and investigated haematologically and radiologically to prevent the dreadful complications. Thus saving the lives of children by early initiation of treatment.

Key words: Children, Dengue fever, Thrombocytopenia.

Introduction

Dengue is a mosquito-borne viral disease that has rapidly spread in all regions of WHO in recent years. Dengue virus is transmitted by female mosquitoes mainly of the species *Aedes aegypti* and, to a lesser extent, *Ae. albopictus*. There are 4 different, closely related, serotypes of the virus that cause dengue (DEN-1, DEN-2, DEN-3 and DEN-4).¹

In a study, the prevalence of dengue, estimates that 3.9 billion people, in 128 countries, are at risk of infection with dengue viruses.² Dengue fever is rapidly expanding in India since the past decade. The continuous ongoing research over dengue clinical profile, expansion of the disease into rural India which was once uncommon, development of a new vaccine, changing nomenclature and misconceptions in treatment laid emphasis on thorough knowledge of this infectious disease. Atypical presentations were noted in dengue fever resulting in delayed diagnosis and treatment.³

Though there have been many studies on clinico-radiological profile and outcome of Dengue fever, very few studies were conducted in Northern part of India and this is very less studied in Pediatric age group. There has been a sudden rise in Dengue fever cases over the last couple of years. This study was conducted to lay emphasis on the clinical and radiological profile in children admitted with fever suggestive of dengue fever as etiology and to allow for proper management minimizing unnecessary treatment. Also, this study would add some information to the already existing literature on clinico-radiological profile of Dengue fever in children.

Aims and objectives

To know the pattern of clinical manifestations of DF and radiological profile. Also estimating the incidence of DF among the pediatric admissions.

Materials and methods

This is cross sectional observational prospective study conducted at Government Medical College/Government General Hospital, Nizamabad, Telangana State, from 10/2021 to 9/2022 for 11 months duration.

Inclusion Criteria:

- 1) Serologically confirmed (NS1Ag alone, IgM alone or Ig M and Ig G Positive) DF patients admitted to the Department of Paediatrics.
- 2) Children aged 1 month to 15 years who fit the clinical case definition of probable dengue with or without warning signs and severe Dengue according to the new case classification given by the WHO.

Exclusion Criteria:

- 1) Serologically negative dengue-like illnesses.
- 2) Those patients with malaria and Enteric fever positive.

Investigations studied in this study

- Complete blood picture including Hb%, RBC, PCV, TLC and Platelet count
- Serum electrolytes, RFTs and LFTs
- Chest X ray Postero – anterior view
- Ultrasound abdomen
- Dengue NS1Ag, Ig M and Ig G antibodies (Fig 1)

Parameters laid importance in USG are gall bladder wall thickening (GBWT) with or without peri cholecystic fluid, presence of hepatomegaly or splenomegaly, presence or absence of ascites.

Written informed consent was obtained from all patients included in the study. A detailed history, complete general physical examination and necessary investigations were done. Vital parameters are recorded daily every sixth hourly and charted. Results were recorded on a structured proforma, tabulated and analyzed.

Outcome Measures:

- 1) Recovery- Nonsevere dengue/ Severe Dengue
- 2) Deaths

Results

A total of 106 cases were enrolled in the present study, majority belonged to the age group of 6-10yrs (63.2%) followed by 11-15yrs (22.6%) and 1-5yrs (12.2%). Infants (1.8%) were least. Average age of presentation was 8.3 ± 3.4 . Male (58%) outnumbered female (42%) with male to female ratio was 1.35:1.

A total number of 106 cases, of which 92 cases (86.7%) were non severe dengue (undifferentiated fever, dengue fever with warning signs and dengue fever without warning signs) and 14 cases (13.2%) were severe dengue (DHF and DSS) according to the WHO classification.⁴

Assessing the clinical features, fever (99%) was present in almost all children, duration of hospital stay 5-8days. Other common symptoms were myalgia/ arthralgia (64.15%), conjunctival congestion (60.3%), retro orbital pain (54.7%), exanthema/ rash (43.3%), abdominal pain (35.8%), headache (33.9%), cough (29.2%), pedal edema (24.5%), facial puffiness (24.5%), lethargy (22.6%), excessive sleepiness (13.2%), abdominal distension (11.3%) and reduced urine output (10.3%) . The spectrum of clinical features is depicted in chart 1. Typical rash in dengue fever was shown in figure 2.

Haemogram was performed in all patients. Mean Hb% was 10.4 ± 1.06 . PCV average was 31.7%. Platelet count was done at the time of admission. According to WHO definition, 72% cases had thrombocytopenia. Majority (41.5%) of the cases were found to have platelet count in between 40,000 – 99,999 at admission. Only few (10%) cases had <20000 platelet count. Assessing bleeding profile (Chart 2) of cases, petechiae was the most (17.9%) common followed by malena (13.2%), epistaxis (10.6%), bleeding gums (10.6%). Dengue serology showed that majority (71.6%) of cases had NS1ag positive followed by IgM (28.3%) and IgG (7.5%).

Among 106 cases, on ultrasound (table 1), hepatomegaly was found in most (35.8%) cases followed by gallbladder wall edema (26.4%) (Fig 3), pleural effusion (13.2%) (Fig 4), peritoneal fluid (0.8%). Splenomegaly was found in least (3.7%) no. of cases.

All most all (99%) cases had recovered, only 1% case had death.

Discussion

Dengue fever is prevalent in almost all tropical countries. The incidence has been increasing yearly. Most of the cases belong to the age group of 6-10yrs (63.2%) and least in infants. This similar to the observations made by Kumar et al.,⁵ Badabagni R et al.⁶ Mishra et al.,⁷ and Namrata et al.,⁸ observed lowest incidence among infants. This study showed male preponderance with male to female ratio 1.35:1. This is in accordance with studies of Kishore E

et al.,⁹ Badabagni R et al.⁶ This can probably due to more outdoor activity among males and full covering clothing in females may contribute lesser incidence among them.

On assessment of clinical features, fever was invariably seen in all cases followed by myalgia/arthralgia (66.4%). This is in accordance with the studies done by Selvan T et al.,¹⁰ Kumar et al.,⁵ Mishra et al.⁷ Other commonly reported symptoms were vomitings, abdominal pain [6, 8, 11, and 12]. Karyanti et al.,⁽¹³⁾ and Senthil Kumar et al.,¹⁴ observed that mean duration of hospital stay was 4 days and 5 days respectively. This is similar to the present study. Bleeding manifestations were noted in about 53% cases. Selvan T et al.,¹⁰ reported 37.3% cases had bleeding tendencies. Others reported⁽¹⁵⁾ lesser incidence of bleeding manifestations. Petechiae were the most common (17.2%) among bleeding manifestations followed by malena (13.2%). This is similar to the studies done by Prabhavathi R et al.¹² Kumar SK et al.,¹⁴ Vanitha SS et al.¹⁵ Khan et al.,¹⁶ reported epistaxis and malena were most common bleeding manifestation.

In the present study, recovery was 99% and only 1% mortality. Namrata KC et al.,⁸ Selvan T et al.,¹⁰ reported recovery of cases is 100% with no mortality. This can be explained by the low virulence of dengue virus. Only few cases belong to severe dengue category, need ICU and ventilator support. Early diagnosis and prompt therapy enhance the recovery rate.

In the present study, mean Hb% was 10.4 ± 1.06 , PCV average was 31.7%. Badabagni R et al.⁶ reported mean haemoglobin was 11.2 gm/dl and PCV 35.2%.

Dengue serology showed that NS1ag positive in majority (71.6%) of cases followed by IgM (28.3%) and IgG (7.5%). Namrata KC et al.⁸ found more than three-fourth (77%) of patients were positive for only NS1 followed by NS1 and IgM were (17.6%) and IgM only were (5.4%). In Priyanka Sharma et al.,¹⁷ study, NS1 antigen was positive 43 cases (83.33%) and dengue IgG antibody was positive in 9 cases (16.66%). Anand R et al.¹⁸ reported NS1positivity among cases as 49.2%, IgM Positive 23%, IgG Positive 1.6% and both IgG &M positive 13.1%. These all studies showed NS1ag specificity in detection of dengue cases.

In the present study, thrombocytopenia was present in 72% cases, 10% cases had < 20,000 platelet count. Badabagni R et al.⁶ observed 43% had thrombocytopenia, 4.8% cases had < 20,000 platelet count.

On radiological examination of all cases, hepatomegaly was found in most (35.8%) cases and Splenomegaly was found in least (3.7%) no. of cases. The more specific feature of dengue i.e. gallbladder wall edema was found in only 26.4%. Selvan T et al.,¹⁰ reported hepatomegaly (24.2%) more frequent than splenomegaly (8.4%). Anand R et al.,¹⁸ Prabhavathi R et al.,¹² made similar observations.

There was sudden peak in the dengue case admissions during months of July, August. The breeding season of Aedes mosquito in rainy season corresponds to this peak. Mishra et al.⁷ made similar observations, peak in rainy season. But Ramana Sastry C et al.,¹⁹ found peak incidence of cases in the months of September and October.

Conclusion

This study showed school age children; especially males were affected with dengue. This study emphasizes the importance of clinical, haematological and radiological evaluation in diagnosing,

predicting the severity of dengue. In timely management can prevent the mortality rate. There is need of intricate vector control programmes and awareness about the mode of spread of dengue. Limitations of this study are small number of study population.

Abbreviations

DEN- dengue

DF- dengue fever

WHO- World Health Organisation

NS1Ag- non specific antigen

IgG, IgM- Immunoglobulin G, M

USG - ultrasound

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Conflicts of interest: None

Ethical approval: This study was approved by Institutional Ethics committee

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Chart 1: Spectrum of clinical features

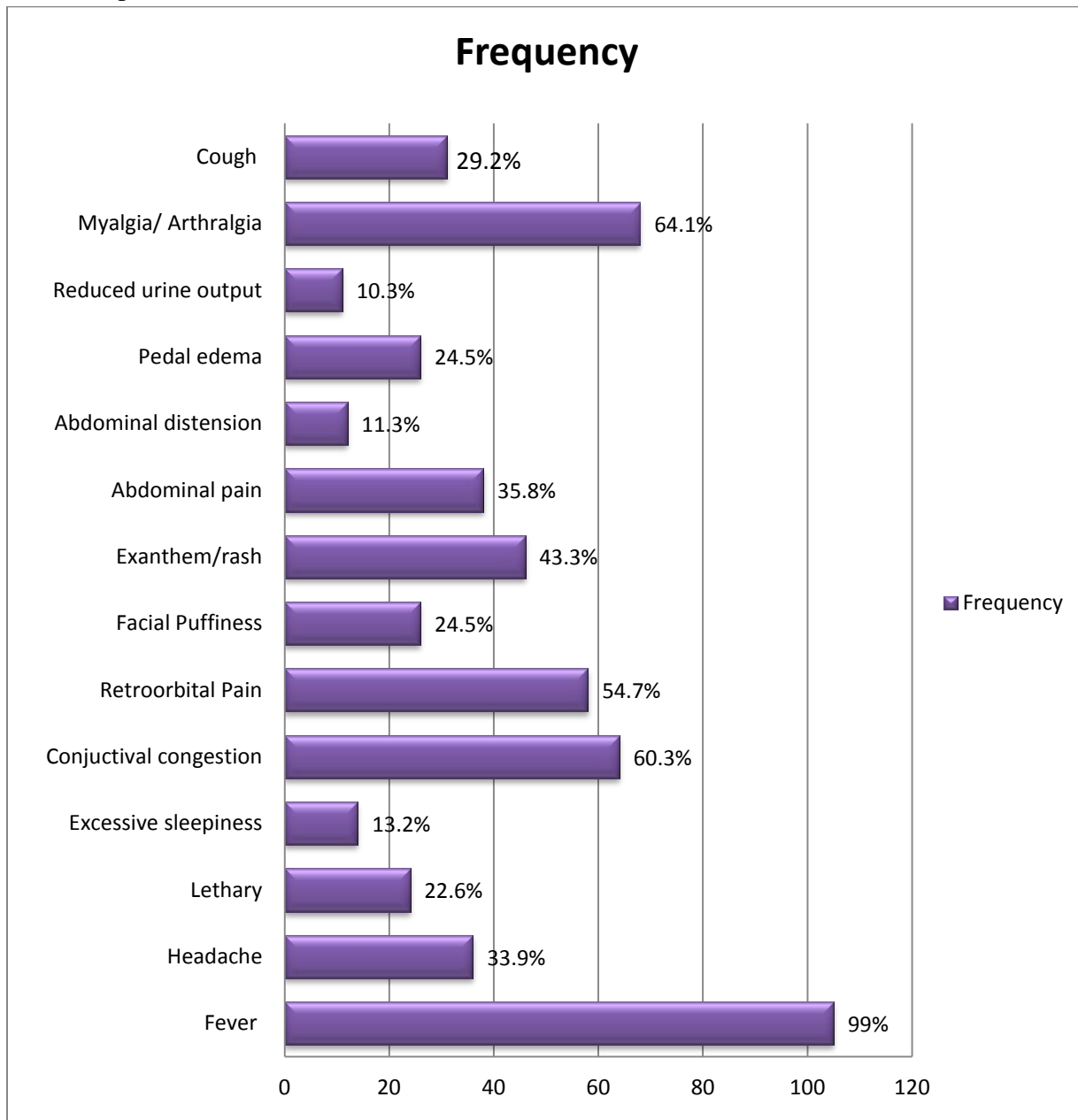
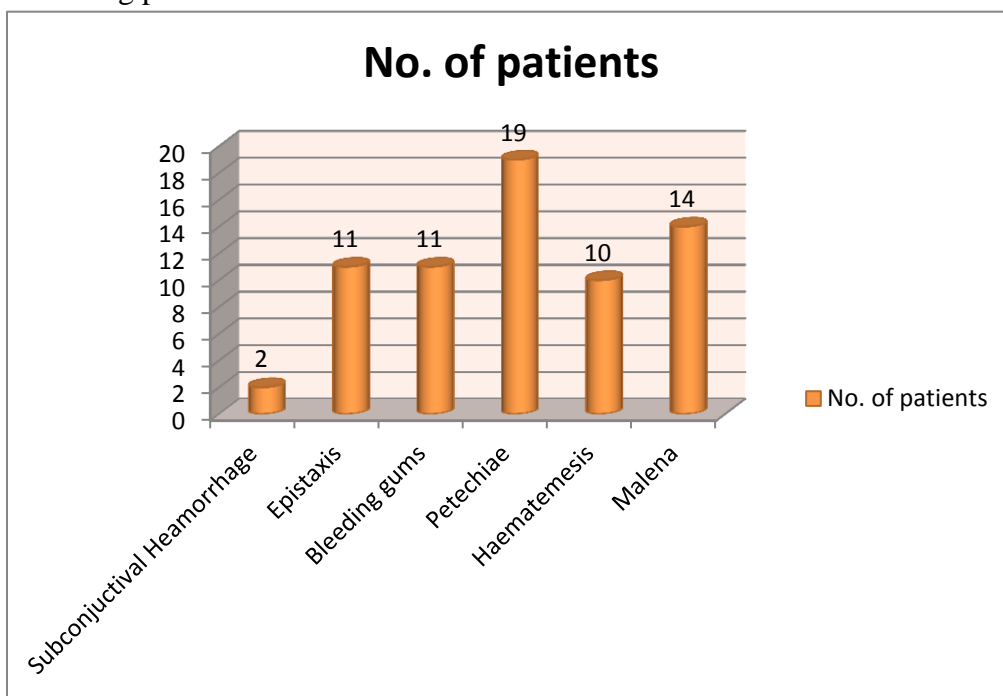


Chart 2: Bleeding profile

**Table 1:** Radiological findings

FEATURE	NO. OF PATIENTS (%)
Hepatomegaly	38 (35.8%)
Splenomegaly	4 (3.7%)
Peritoneal fluid	9 (8.4%)
Pleural effusion	14 (13.2%)