ISSN:0975-3583,0976-2833 VOL13,ISSUE04,2022

# A STUDY ON CLINICAL PROFILE AND OUTCOME OF DENGUE FEVER IN CHILDREN ADMITTED IN A TERTIARY CARE HOSPITAL

**Dr. Anitha Edara[1], Dr. M. Hema Sundar Rao[2],*Dr. Dileep Kumar Allagadda[3]**

1. Assistant Professor, Department of Pediatrics, Santhiram Medical College and Hospital, Nandyal, Andhra Pradesh.
2. Associate Professor, Department of Pediatrics, Gayatri vidya Parishad Health care and medical technology, Visakhapatnam, Andhra Pradesh.
3. Assistant Professor, Department of Pediatrics, Mallareddy Institute of Medical Sciences, Hyderabad.

*Corresponding Author**: Dr. Dileep Kumar** Allagadda, Assistant Professor, Department of Pediatrics, Mallareddy Institute of Medical Sciences, Hyderabad.

## ABSTRACT

**Background:**Dengue infection is the most rapidly emerging vector-borne viral disease with a 30-fold increasing global incidence over the last five decades. It is a major public health concern throughout tropical and subtropical regions of the world. In India, every year cases are spreading to newer geographical areas.

**Objective:** To study the clinical profile and outcome of Dengue fever in children admitted in a tertiary care hospital.

**MATERIAL & METHODS: Study Design:** Prospective Observational study.**Study area:** The study was done in Department of paediatrics, in a tertiary care hospital. **Study Period:**April 2021 – March 2022 (1 year).**Study population:**Children age group of 1-12 years presenting with fever and other features suggestive of Dengue fever.**Sample size:** A total of 62 were included in the study.**Ethical consideration:** Institutional Ethical committee permission was taken prior to the commencement of the study. **Study tools and Data collection procedure:**Children age group of 1-12 years presenting with fever and other features suggestive of Dengue fever according to WHO guidelines will be assessed clinically, serologically and managed as for WHO protocol and will be followed for outcome.

**Results:** Major clinical features that were observed in most cases were pain abdomen (74%), vomiting (72.5%), arthralgia (74%), body pains (72.5%), poor intake (74%), conjunctival suffusion (74%) & facial puffiness (74%), hepatomegaly (74%) and ascites (72.5%).

**CONCLUSION:**

The detection of IgM dengue antibodies by capture ELISA & NS1 Ag were helpful for diagnosis of acute dengue virus infection. The serological diagnosis of dengue fever has a role in categorizing primary and

ISSN:0975-3583,0976-2833 VOL13,ISSUE04,2022

secondary infection and it also serves as a predictor of disease progression and mortality especially in severe dengue.

**Key words:** IgM dengue antibodies, Dengue infection, ELISA & NS1 Ag

**INTRODUCTION:**

Dengue infection is the most rapidly emerging vector-borne viral disease with a 30-fold increasing global incidence over the last five decades. It is a major public health concern throughout tropical and subtropical regions of the world. In India, every year cases are spreading to newer geographical areas.

Dengue infection needs to be addressed as a single disease with different clinical presentations ranging from asymptomatic conditions to severe clinical courses that may lead to high morbidity and mortality. In the absence of a specific antiviral drug for dengue infection, it is a great challenge for the clinicians to recognize the severity of the disease at the early phase for early intervention and timely effective management to reduce complication and death[1].

The incidence of dengue has grown dramatically around the world in recent decades. The actual numbers of dengue cases are underreported and many cases are misclassified. One recent estimate indicates 390 million dengue infections per year (95% credible interval 284–528 million), of which 96 million (67–136 million) manifest clinically (with any severity of disease)[1]. Another study, of the prevalence of dengue, estimates that 3.9 billion people, in 128 countries, are at risk of infection with dengue viruses[2]. Member States in three WHO regions regularly report theannual number of cases across the Americas, South-East Asia and Western Pacific exceeded 1.2 million in 2008 and over 3.2 million in 2015[2].

The year 2016 was characterized by large dengue outbreaks worldwide. The Region of the Americas region reported more than 2.38 million cases in 2016, where Brazil alone contributed slightly less than 1.5 million cases, approximately three times higher than in 2014[2].

In India, dengue has seen resurgence in recent times. The first evidence of Dengue fever in India was reported during 1956 in Vellore district (Tamil Nadu). The first Dengue hemorrhagic fever outbreak occurred in Calcutta (West Bengal) in 1963 with 30% of cases showing hemorrhagic manifestations. All of the four serotypes i.e. Dengue 1, 2, 3 and 4 have been isolated in India. Aedes aegypti breeds more commonly in urban areas. However the trend is now changing due to socioeconomic and manmade ecological changes, it has resulted in invasion of Aedes aegypti in to the rural areas, which has tremendously increased the chances of spread of the disease to rural areas. Recurring outbreaks of DF & DHF have been reported from various states/union

ISSN:0975-3583,0976-2833 VOL13,ISSUE04,2022

territories namely Andhra Pradesh, Delhi, Goa, Haryana, Gujarat, Karnataka, Kerala, Maharashtra, Rajasthan, Uttar Pradesh, Pondicherry, Punjab, Tamil Nadu, West Bengal and Chandigarh[4]. In 2015, Delhi, India, recorded its worst outbreak since 2006 with over 15000 cases [3].

**Objective:** To study the clinical profile and outcome of Dengue fever in children admittedin a tertiary care hospital.

**MATERIAL & METHODS:**

**Study Design:** Prospective Observational study.

**Study area:** The study was done in Department of paediatrics, In a tertiary care Hospital.

**Study Period:**April 2021 – March 2022 (1 year).

**Study population:**Children age group of 1-12 years presenting with fever and other features suggestive of Dengue fever.

**Sample size:** A total of 62 were included in the study.

**Sampling method:**Simple random sampling technique.

**Inclusion Criteria:**

• Children age group 1 - 12 years.

• Children's with fever and other features suggestive dengue fever according to WHO guidelines {headache, retro orbital pain, myalgia / arthralgia, rash, hemorrhagic manifestations, thrombocytopenia and leucopenia}.

**EXCLUSION CRITERIA:**

• Those with other viral fevers with thrombocytopenia.

• Those with positive for Malaria parasite (All species).

• Those with acute and chronic liver disease.

• Those with blood dyscrasias.

**Ethical consideration:** Institutional Ethical committee permission was taken prior to the commencement of the study.

ISSN:0975-3583,0976-2833 VOL13,ISSUE04,2022

**Study tools and Data collection procedure:**Children age group of 1-12 years presenting with fever and other features suggestive of Dengue fever according to WHO guidelines will be assessed clinically, serologically and

| SEX | NO OF PATIENTS | PERCENTAGE |
|---|---|---|
| **MALE** | 35 | 56.5 |
| **FEMALE** | 27 | 43.5 |
| **TOTAL** | 62 | 100 |

managed as for WHO protocol and will be followed for outcome.

**All the children are subjected for following investigations**

- Complete Blood Picture.
- IgM antibody detection (SD Dengue IgM Capture Elisa kit ).
- NS1Antigen detection (Panbio Dengue Early ELISA kit).

Other relevant investigations for renal, liver and other functions.

The Panbio Dengue Early ELISA is a dengue NS1 antigen capture ELISA. It is for qualitative detection of NS1 Ag in human serum. SD Dengue IgM Capture Elisa kit is used for qualitative detection of IgM dengue antibodies specific to Dengue virus in human serum.

**OBSERVATIONS & RESULTS**

**Table 1: DISTRIBUTION OF CHILDREN ACCORDING TO GENDER**

In this study 35(56.5%) were male children and remaining 27(43.5%) were female children.

**Table 2: THE DISTRIBUTION OF DENGUE FEVER ACCORDING TO AGE**

| AGE GROUP IN YEARS | NO OF PATIENTS | PERCENTAGE |
|---|---|---|
| 1-3 | 18 | 29 |
| 4-6 | 25 | 40.3 |
| 7-9 | 11 | 17.7 |
| 10-12 | 8 | 13 |
| T0TAL | 62 | 100 |

The study observed that maximum number of cases occurred between 4-6 yrs, constituting 40.3%.

**Table 3: CLINICAL FEAUTRES**

ISSN:0975-3583,0976-2833 VOL13,ISSUE04,2022

| CINICAL FEAUTRES | NO OF PATIENTS | PERCENTAGE |
|---|---|---|
| HEADACHE | 31 | 50 |
| RETROORBITAL PAIN | 21 | 33.8 |
| FATIUGE | 32 | 51.6 |
| PAIN ABDOMEN | 46 | 74.1 |
| VOMITINGS | 45 | 72.5 |
| ARTHRALGIA | 46 | 74.1 |
| BODY PAINS | 45 | 72.5 |
| POOR INTAKE | 46 | 74.1 |
| SKIN BLEEDS | 29 | 46.7 |
| EPISTAXIS | 20 | 32.2 |
| HEMATEMESIS | 13 | 20.9 |
| MELENA | 26 | 41.9 |
| CONVULSIONS | 2 | 3.2 |
| CONJUCTIVAL SUFFUSION | 46 | 74.1 |
| HEPATOMEGALY | 46 | 74.1 |
| SPLENOMEGALY | 32 | 51..6 |
| TORNIQUET TEST | 32 | 51.6 |
| FACIAL PUFFINESS | 46 | 74.1 |
| ASCITES | 45 | 72.5 |
| PEDAL EDEMA | 20 | 32.2 |

Major clinical features that were observed in most cases were pain abdomen (74%), vomiting (72.5%), arthralgia (74%), body pains (72.5%), poor intake (74%), conjunctival suffusion (74%) & facial puffiness (74%), hepatomegaly (74%) and ascites (72.5%).

**Table 4: Classification of dengue according to clinical picture**

| Clinical picture | NO OF PATIENTS | PERCENTAGE |
|---|---|---|

ISSN:0975-3583,0976-2833 VOL13,ISSUE04,2022

| | | | | |
|---|---|---|---|---|
| **DW** | | **IgM Ab categorization** | | **total(%)** |
| | | Positive (%) | Negative (%) | |
| Positive | | 24 (99.6) | 1 (0.4) | 25 (100) |
| Negative | | 6 (16.2) | 31 (83.8) | 37(100) |
| total | | 30 (48.3) | 32(51.7) | 62 |

| **S NO** | | | |
|---|---|---|---|
| 1 | Probable dengue | 8 | 13 |
| 2 | Dengue without warning signs | 3 | 4.8 |
| 3 | Dengue with warning signs | 25 | 40.3 |
| 4 | Severe dengue | 26 | 41.9 |

Majority patients observed in this study were severe dengue (41.9%) followed by dengue with warning signs (40.3%).

**Table 5: Dengue with warning signs by IgM Ab**

P=0.0001 ;<0.05, S

Dengue with warning signs was more common in children with dengue IgM antibody test positive.

**Table 6: Dengue with warning signs by NS1Ag category**

P=0.004, <0.05, S

| **DW** | **Ns1 Ag** | | **Total %** |
|---|---|---|---|
| | Positive (%) | Negative (%) | |
| Positive | 15(60) | 10 (40) | 25 |
| Negative | 9(24.3) | 28(75.6) | 37 |
| total | 24(38.7) | 38(61.3) | 62 |

Dengue with warning signs more common in children with NS1 Ag test positive.

**Table 7: SEVERE DENGUE by IgM Ab category**

ISSN:0975-3583,0976-2833 VOL13,ISSUE04,2022

| SEVERE DENGUE | IgM Ab categorization | | Total % |
|---|---|---|---|
| | positive | negative | |
| Positive | 25 (98.4) | 1(1.6) | 26 |
| Negative | 5 (13.8) | 31(86.2) | 36 |
| Total | 30(48.3) | 32(51.7) | 62 |

P=0.001 ;< 0.05; S

Severe dengue is more common in children with dengue IgM antibody test positive.

**Table 8: SEVERE DENGUE by NS1Ag**

| DSS | NS1Ag | | Total (%) |
|---|---|---|---|
| | Positive (%) | Negative(%) | |
| positive | 15 (57.6) | 11 (42.3) | 26 (100) |
| negative | 9 (25) | 27 (75) | 36(100) |
| total | 24 (38.7) | 38 (61.3) | 62(100) |

P=0.009 ;< 0.05; NS

Severe Dengue more common in children with NSI Ag test positive.

Most common manifestations are pain abdomen, vomiting, arthralgias, body pains. More common bleeding manifestations in dengue with warning signs are skin bleeds and melena followed by epistaxis.

In severe dengue most common manifestations were skin bleeds (100%) (26/26) and melena (100%) (26/26).

**DISCUSSION:**

Dengue is an acute arboviral disease. It is probably one of the most important viral diseases in terms of human morbidity and mortality. The WHO says nearly 2.5 billion people , i.e., two fifths of the world population are now at risk from dengue and estimates that there may be 50 million cases of dengue infection worldwide every year[3]. The spectrum ranges from self limiting dengue fever to more severe forms of dengue fever with warning signs or severe dengue[4]. The problem of dengue has reached mammoth proportions in India since the first epidemic of clinical dengue like illness was recorded in Madras in 1780. It is compounded by the huge population, poor medical and diagnostic facilities and inadequate mosquito control[3-6].

ISSN:0975-3583,0976-2833 VOL13,ISSUE04,2022

Among 62 cases studied 35 were males (56.45%) and 27. (43.55%) were females; male to female ratio is 1.3:1. In a study by Shubhankar Mishra etal (2016)[7], the male to female ratio was 3.4:1.Similar results were seen in a study by Pothapregada S et al (2016)[8], the male to female ratio was 1.2:1. In a study by Hemant Jain (2016)[9], out of 65 cases, males were 53% and females were 47%. In a study by Selvan T et al(2017)[10], the age and sex majority of the cases were in the age group of 10-18 years with 39.4% followed by 6-10 years with 34.5%.

In Shah G.S. et al (2006)**[11]**, the mean age group was 8.3 yrs .In a study conducted by Ira shah et al,(2005)**[12]**, the mean age group was 6.1yrs. In a study by Shubhankar Mishra et al (2016)[7], the mean age of patients was 8.7 yrs**.** In a study by Sahana KS et al (2015)[13], mean age of presentation was 8 y. In the study by Faridi et al (2008)[44], most of the cases (52.9%) were in the 10–12 year age group. In a study by Selvan T et al (2017)[10], male to female ratio was 1.7:1.In the present study also most of the reported cases were from the age group of 4-6 yr. In a study by Hemant Jain (2016)[9], maximum number of cases seen in the age group of 5-10 years (46%).

The present study the most common clinical presentation along with fever was pain abdomen (74%), vomiting (72.5%), arthralgia (4%), body pains (72.5%), poor intake (74%), hepatomegaly (74%).Similar observations were made in study conducted by Neeraja.M and Lakshmi.V. et al (2006)[14]. In a study by Shubhankar Mishra et al (2016)[7], myalgia (76.8%) and abdominal pain (54.3%) were common symptoms. In a study by Sahana KS et al (2015)[13], vomiting (60.5 %), pain abdomen (32 %), headache (30.9 %), myalgia (23.5 %) and bleeding manifestations (16 %) were the common presenting complaints.

In the present study tourniquet test positive in 32 patients out of 62 children constituting 51.6%. In the study by Faridi et al (2008)[15], positive tourniquet test was seen in 64.7%.

In present study common bleeding manifestation in severe dengue patients were skin bleeds i.e. petechiae (100%) and melena (100%) followed by epistaxis 73.8% and hematemesis 48.6%. Similar results were observed in a study by Shubhankar Mishra et al (2016)[7], the most common bleeding manifestations in both severe and non-severe dengue were petechiae (22.1%). In study by Shah G.Set al (2006) **[11]**common bleeding manifestations were skin bleeds (59%).In study by Gurdeep.S.Dhooria et al (2008)**[16]**, most common bleeding manifestations were petechiae in 85% followed by melena (6%), echymosis(2.5%) and epistaxis(2.5%).

In a study by Basuki PS et al(2010)using the WHO classification system 1997, 122 cases (84.1%) were classified as having non-severe dengue, of which 70 (48.3%) were classified as having dengue fever (DF), 39 (26.9%) as having dengue hemorrhagic fever (DHF) grade I, and 13 (9%) as having DHF grade II. Twenty-three (15.9%) were classified as having severe dengue, of which 16 (11%) were classified as having DHF grade III and 7 (4.8%) as having DHF grade IV.

ISSN:0975-3583,0976-2833 VOL13,ISSUE04,2022

In a study by Sahana KS et al (2015)[13], number of cases classified as Dengue without warning signs , Dengue with warning signs (DW) and Severe Dengue (SD) were 48.1 %, 27.2 % and 24.7 % respectively. In a study by Hemant Jain (2016)[9,] dengue without warning signs were 23%, dengue with warning signs were64%, and severe dengue were12% of cases.

In study by Gurdeep.S.Dhooria et al (2008)[16]92% of cases were dengue hemorrhagic fever, 7.4% cases presented in dengue shock syndrome.our study of 62 cases 8(13%) were probable dengue fever, 3 (4.8%) were dengue without warning signs, 25(40.3%) dengue with warning signs 26(40.9%) presented with severe dengue. Using the new dengue classification system 2009, In a study by Basuki PS et al(2010)[17], 117 cases (80.7%) were classified as having non-severe dengue infection, of which 79 (54.5%) were classified as having dengue without warning signs and 38 (26.2%) were classified as having dengue with warning signs, while 28 (19.3%) were classified as having severe dengue infection. . Based on the WHO TDR 2009 dengue guidelines, in a study by Shubhankar Mishra, et al (2016)[7], the total number of cases analyzed was 97, out of which84 (86.59%) were categorized as cases of non-severe dengue which included both undifferentiated fever and dengue fever (DF) (both with and without warning signs) and 13 (13.40%) were cases of severe dengue (DHF grades 1–4).

In this study Ns1Ag test was positive 29.2% cases. Similar observation seen in study by B.Mustafa MPH et al (31.2%)(2010)[18]. In our study there is strong correlation present between NS1Ag positivity and severe dengue and dengue with warning signs. In a study by Shubhankar Mishra et al. (2016)[7], the majority of the patients were positive for NS1 followed by IgM. In a study by Pothapregada S et al (2016)[8], Dengue IgG antibody was positive in 17 cases (6.5%) and among them, severe dengue infection was seen in 16 cases (94.1%). In study by Hemant Jain (2016)[9], NS 1 antigen was positive in 80% of cases; IgM and IgG was positive in 52% and 36 % cases respectively.

**CONCLUSION:**

The detection of IgM dengue antibodies by capture ELISA & NS1 Ag were helpful for diagnosis of acute dengue virus infection. The serological diagnosis of dengue fever has a role in categorizing primary and secondary infection and it also serves as a predictor of disease progression and mortality especially in severe dengue.

**REFERENCES:**

1. Hand book of clinical management of dengue fever, 2012 Revised and expanded edition, WHO,2012.

ISSN:0975-3583,0976-2833 VOL13,ISSUE04,2022

2. Dengue guidelines for diagnosis, treatment, prevention and control,new edition,2009, A joint publication of the World Health Organization (WHO) and the Special Programme for Research And Training in Tropical Diseases (TDR).

3. Park K. Epidemiology of communicable Diseases. In Park 'Text book of Preventive and Social Medicine. Banarsidas Bhanot.2017 :21 st. ed,224.

4. National guidelines for clinical management of dengue fever 2015. (Directorate of National Vector Borne Disease Control Programme, Delhi).

5. Dengue status in south east Asian region: An Epidemiological Perspective +WHO Report. 2017

6. Duane J Gubler. Dengue and Dengue hemorrhagic fever. Clinical Microbiology Reviews; 1998:7:480-496.

7. Shubhankar Miishra: clinical profile of dengue fever in children: a study from southern Odisha, india. January 2016: Hindawi publishing corporation, scientifical, volume 2016.

8. Pothapregada S, Kamalakannan B, Tulasingham M,Smpath S- , Clinically profiling pediatric patients with dengue, journal of global infectios diseases -2016.

9. Hemant Jain, Clinical profile and outcome of dengue fever in hospitalized children of south rajasthan, India, international journal of contemporary pediatrics, vol 3, no 2 (2016).

10. Selvan T, Nagaraj MV, Saravanan P, Somashekar. A study of clinical profile of dengue fever in children. Int J Contemp Pediatr 2017;4:534.

11. Shah G S,Islam S, Das B K.clinical and laboratory profile of dengue infection in children , Kathmandu University. Med. J. 2006: vol 4 No. 1, Issue 13:40-43.

12. Ira Shah and Bhushan Katira. Clinical and Laboratory Abnormalities due to Dengue in Hospitalized children in Mumbai in 2004.

13. KS Shanana , R Sujatha : Clinical profile of dengue among children according to revised who classification : analysis of a 2012 out break from southern India. Indian journal of pediatrics; feb 2015; volume 82 ; issue 2.

14. Neeraja M, Lakshmi V, Teja V D, Umabala P, Subbalakshmi M V. Serodiagnosis of Dengue virus infection in patients presenting to a Tertiary care Hospital. Indian Journal of Medical Microbiology.2006:24 (4):280-2.

15. Faridi MMA, Aggarwal A, Kumar M.et al. Clinical and biochemical profile of dengue hemorrhagic fever in children in Delhi. Trop Doct,2008;38(1):28-30.

16. Gurdeep .S .Dhooria,Deepak Bhat,Harmesh S Bains.Clinical Profile and Out come in Children of Dengue Hemorrhagic Fever in North India.Iran J Pediatr.Sep 2008;Vol 18(No 3 ),Pp222-228.

ISSN:0975-3583,0976-2833 VOL13,ISSUE04,2022

17. Basuki PS1, Budiyanto, Puspitasari D, Husada D, Darmowandowo W, Ismoedijanto, Soegijanto S, Yamanaka A. Application of revised dengue classification criteria as a severity marker of dengue viral infection in Indonesia. Southeast Asian J Trop Med Public Health. 2010 Sep.

18. B.Mustafa,MPH,A W Asmah Hani,BSc,Epidemilogical and clinical features of Dengue versus other Acute Febrile Illnesses Amongst patients seen at Government polyclinics.Med J Malaysia vol.65 Nov4 December 2010:293-298.