Research Article

Assessment of Clinical Characteristics and Management for Dengue Fever among Paediatrics

Dr. A.Jesudasan[1], Nithya R.*[2], Gayathri.M[3], Merlin Jose [4], Monica.B[5], Muthu Selvi.R[6]

[1]Consultant Paediatrician, Vivekanandha Medical Care Hospital, Elayampalayam, Tiruchengode, Namakkal Dist, Tamil Nadu, India.

*[2]Assistant professor, Department of Pharmacy Practice, Swamy Vivekanandha College of Pharmacy, Elayampalayam, Tiruchengode, Namakkal Dist, Tamil Nadu, India. (Affiliated to the Tamil Nadu Dr.M.G.R. Medical University, Chennai)

[3,4,5,6] Doctor of Pharmacy- Intern Department of Pharmacy Practice, Swamy Vivekanandha College of Pharmacy, Elayampalayam, Tiruchengode, Namakkal Dist, Tamil Nadu, India. (Affiliated to the Tamil Nadu Dr. M.G.R. Medical University, Chennai)

***Corresponding author's E-mail:** nithyapharma14@gmail.com

Received: 10-02-2022; **Revised:** 19-04-2022; **Accepted:** 26-04-2022; **Published on:** 15-05-2022.

ABSTRACT

The background of this study is the mosquito- borne arboviral disease dengue has become a problem all over the world. Children under the age of 15 make up the majority of dengue cases. This study aimed to assess the clinical characteristic and management of dengue fever among paediatric patients. Objective: The main objective of the study is to assess the socio-demographic characteristics of dengue fever among paediatrics population, to assess the clinical profile and management of dengue fever among paediatrics population. Based on inclusion and exclusion criteria, a total of 50 subjects were enrolled in the study. The research was conducted at Vivekanandha Medical Care Hospital as a single-center retrospective cross-sectional study. The data is to collected through chart review of existing medical record of study site. The participants were predominantly of age group 11-15 years (52%), Male (66%) participants was more than females, locality wise distribution rural (90%), blood group distribution O+ (48%), Treatment duration 4-6 days (54%), clinical presentation of fever (94%), Clinical profile such as Thrombocytopenia (78%) and NS+ (78%), Majority of population was treated with IV fluids and anti-pyretics (100%). Early diagnosis, accurate assessment and appropriate treatment as per national guideline based on WHO protocols will reduce the morbidity and mortality rate in pediatric population.

Keywords: Dengue fever, viral infection, clinical characteristics, Blood group

QUICK RESPONSE CODE →

DOI: 10.47583/ijpsrr.2022.v74i01.005

DOI link: http://dx.doi.org/10.47583/ijpsrr.2022.v74i01.005

INTRODUCTION

Dengue fever is the most common viral disease transmitted by mosquitos around the world. Dengue fever has surged 30-fold in the previous 50 years, with newborns experiencing the greatest rates[1]. One of the most prevalent arboviral illnesses in humans is dengue fever[2]. Female Aedes mosquitos, especially Aedes aegypti and, to a lesser extent, Aedes albopictus, spread dengue fever[3].

Dengue fever is a self-limiting acute mosquito-borne disease with clinical manifestations in children. It is critical for patient care and, as a result, lifesaving. These infections can cause Dengue fever, Dengue hemorrhagic fever without shock or with shock. One of four serotypes of the Dengue virus (DENV), which belongs to the Flaviviridae family, causes dengue fever (DENV-1 to DENV-4). Although the viral serotypes are related, they are antigenically diverse [2].

Dengue fever affects people of all ages, but it is most common in children. Many people are infected but do not develop a fever, allowing mosquitoes to continue the transmission chain. Dengue fever is suspected in children with the following symptoms and indications, according to the WHO classification. Fever of a high-grade Headache, myalgia, and arthralgia, facial flushing, malaise, and body soreness are some of the symptoms that people experience. Rash and cutaneous erythema, retro orbital eye discomfort, photophobia, Anorexia, nausea, and vomiting are all typical side effects[4,5,6]. The Dengue specific Non-Structural Protein 1 antigen (NS1 Ag) and Immunoglobulin M antibody (IgMAb) Enzyme Linked Immunosorbent Assay (ELISA) are the most often utilized diagnostic modalities in endemic areas because to their cost effectiveness and enhanced sensitivity and specificity[7,8].

There is currently no effective antiviral treatment for dengue fever. Balapiravir, a polymerase inhibitor, for example, has not been proved to be more effective than placebo[9]. Symptomatic treatment with bed rest and acetaminophen/Paracetamol is used in patients with minor symptoms and adequate oral fluid intake. Non steroidal anti-inflammatory medications and acetylsalicylic acid should be avoided since they suppress platelets. To diagnose thrombocytopenia or, more crucially, capillary leakage, daily clinical evaluation and laboratory monitoring of total blood count are required. As a result, disease

management is predominantly supportive, with a focus on fluid control [10]. The current World Health Organization dengue fever recommendations provide a precise fluid management regimen for dengue patients. In the event of serious bleeding, blood transfusions are required[11]. There is currently no licensed dengue vaccine available, but various formulations are being studied[10]. Prophylaxis by avoiding mosquito bites by Aedes mosquitos remains the cornerstone of dengue prevention due to the lack of both particular therapeutic alternatives and a vaccine. This is especially true for youngsters who have had their first dengue illness and are returning to locations where the disease is prevalent. In this study we assessed clinical characterization and management among dengue infected children.

METHODOLOGY

It was a single centered retrospective cross-sectional study. The study was conducted on confirmed cases of dengue fever admitted in the department of pediatrics at a Vivekanandha Medical Care Hospital in Namakkal from February 2020 to January 2022. All serologically confirmed case of dengue fever from 0 to 15 years of age were included in the study. Children having other co-infections and major co-morbid conditions which affect the outcome like major congenital malformations, surgeries were excluded from study.

The data was collected through chart review of existing medical record of study site. There were 50 cases of serologically confirmed cases of dengue which satisfied the inclusion and exclusion criteria were included in the study. The parameters which were studied were clinical presentation, examination findings at admission, lab analysis included are hemoglobin (HB), White blood cells (WBC), Red blood cells (RBC), Platelet count, serology of dengue, treatment received during the hospitalization and duration of hospital stay.

All relevant data was filled into Microsoft Excel. The analysis was done with the help of MS Excel.

RESULTS

A total of 50 paediatric population was enrolled in the study based on inclusion and exclusion criteria.

Table 1: Socio-demographic data distribution

Socio-demographic data of paediatric participants			
Demographic Data	**Variables**	**Frequency**	**Percentage**
Age	Below 3 years	3	6%
	4-7 years	5	10%
	8-11 years	16	32%
	11-15 years	26	52%
Gender	Male	33	66%
	Female	17	34%
Locality	Rural	45	90%
	Urban	5	10%
Duration Of Stay	0-3 Days	9	18%
	4-6 Days	27	54%
	Above 6 days	14	28%
Blood Group	A+	3	6%
	A-	2	4%
	B+	15	30%
	B-	2	4%
	AB+	3	6%
	AB-	1	2%
	O+	24	48%
	O-	0	0%

Age wise distribution

The participants were predominant under age group 11-15 (52%), than other age group, followed by age group 8-11 (32%) and 4-7 (10%).And the least number of participants were in age group below 3 years (6%), represented in figure 1 and table 1

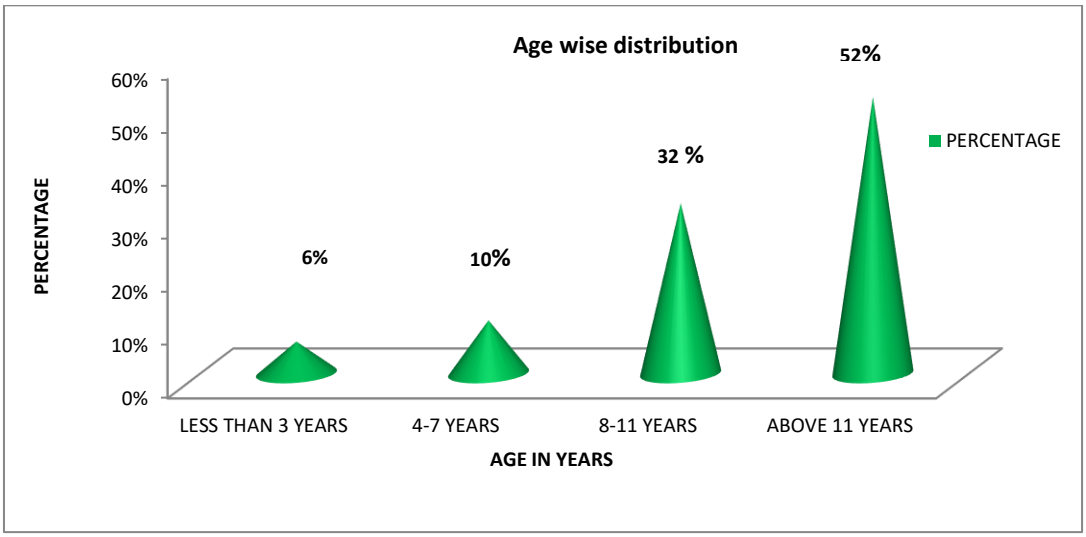


Figure 1: Age wise distribution

Gender wise distribution

Among 50 participants, 33 (66%)were male and 17 (34%) were female as represented in table 1 and figure 2

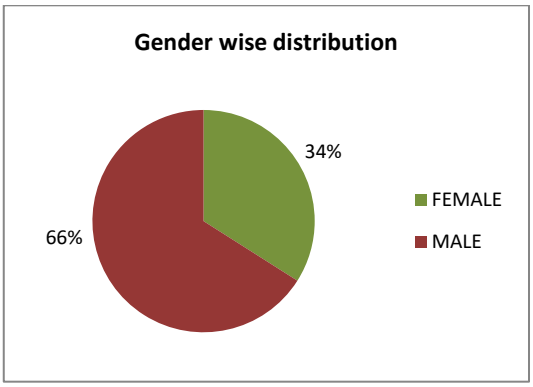
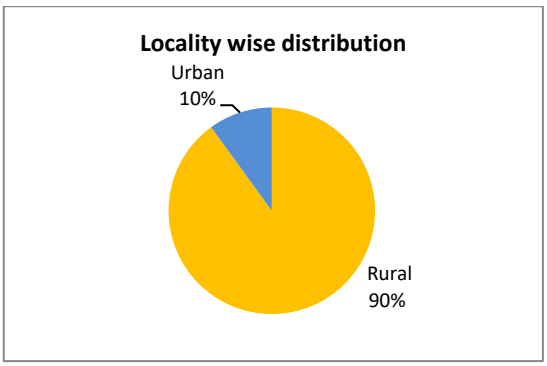


Figure 2: Gender Wise Distribution

Locality wise distribution

Among 50 participants, 45 (90%) were from rural area and 10 (10%) were from urban area as represented in table 1 and figure 3



Duration of stay

Among 50 participants 27 (54%) have stayed in hospital in period of 4-6 days, followed by above 6 days (28%) and 6 (18%) represented in table 1 and figure 4.

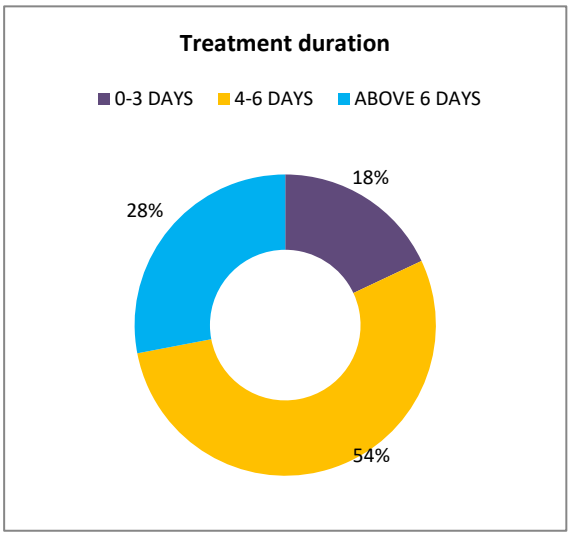


Figure 3: Duration of Stay

Blood group wise distribution

Among 50 population, Majority were having O+ (48%) followed by B+ (30%),A+ (6%), AB+ (6%), A- (4%), B- (4%), AB- (2%) respectively. Represented in table 1 and figure 5

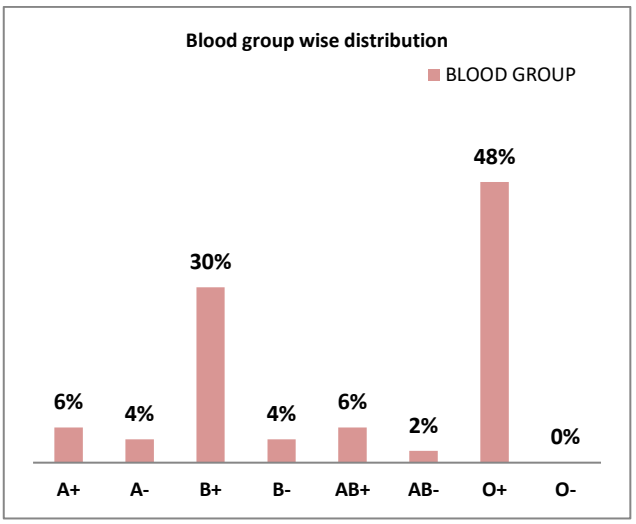


Figure 4: Blood Group Wise Distribution

Categorization of clinical manifestations

Among the population, fever was most common symptom 47 (94%), followed by loss of appetite 30(60%), headache 28 (56%), Nausea and vomiting 27 (54%), body pain 26 (52%), abdominal pain 19 (38%), Cough, cold, chills, and rashes 10 (20%), Tiredness 9 (18%), Myalgia 6 (12%), and Loss of motion 5 (10%).

Table 2: Frequency distribution of clinical manifestation

Clinical manifestations		
Variables	**Frequency**	**Percentage**
Fever	47	94%
Body Pain	26	52%
Headache	28	56%
Loss Of Appetite	30	60%
Myalgia	6	12%
Rashes	10	20%
Abdominal Pain	19	38%
Tiredness	9	18%
Nausea And Vomiting	27	54%
Loss Motion	5	10%
Cough	10	20%
Cold And Chills	10	20%

Categorization of clinical profile

Among the 50 Paediatric population majority of them were presented with Thrombocytopenia 39 (78%), Leukopenia 31 (62%), and Anemia 28 (56%).Dengue serology examination among the patients shows that higher proportion of the population were with Dengue NS1+ 39 (78%), remaining with Ig M, Ig G, and Ig M & Ig G.

Table 3: clinical profile categorization

Clinical profile			
Clinical profile	**Variable**	**Frequency**	**Percentage**
Hematological profile	Thrombocytopenia	39	78%
	Leukopenia	31	62%
	Anemia (Age adjusted minimum	28	56%
Dengue serology	NS1+	39	78%
	Ig M	4	8%
	Ig G	3	6%
	Ig G & Ig M	4	8%

Determinant of severity of dengue among paediatric population

Out of 50 Paediatric population, 8% were severe dengue, 13% of population have moderate and rest of the patient have mild dengue fever.

Table 4: Determinant of severity of dengue among paediatric population

Category	Frequency	Percentage
Mild	7	13%
Moderate	39	78%
Severity	4	8%

Pattern of clinical management of dengue in paediatric population

Out of 50 Paediatric population, Majority of population was treated with IV fluids 50 (100%), Anti pyretic 50 (100%), Proton pump inhibitor's 50 (100%) Anti-emetics 27 (54%) and Anti-histamines 20 (40%). And minority of population are treated with antibiotics 5 (10%), Anti – diarrhoea 5(10%) and platelet transfusion 4 (8%)

Table 4: Pattern of clinical management of dengue in paediatric population

Variable	Frequency	Percentage
Iv Fluids	50	100%
Anti-Emetics	27	54%
Antipyretics	50	100%
Platelet Transfusion	4	8%
Proton Pump Inhibitor	50	100%
Antibiotics	5	10%
Antihistamine	20	40%
Antitussive	10	20%
Anti-Diarrhea	5	10%

DISCUSSION

Dengue fever is a common arboviral infection in tropical area. Dengue fever's global prevalence has risen considerably in recent years. In our study, majority of children belongs to age group 11-15 years were the most commonly affected. This result was similar to study conducted by Mishra et al,[12] . Their study revealed that patients above the age 11years were most commonly affected.

A total of 50 Paediatric patients were included in this study. Among them (66%) were males and (34%) were females. Gender showed significant differences, with males patients were exceed than the females. The study was similar to study conducted by Astuti et al[13]. Their study revealed that the male patientswas more than the female patients.

The most frequent blood group among dengue infected children in our study was 'O' positive (48%) in contrast to the most common ABO and Rh blood ,followed by B+ (30%),A+ (6%), AB+ (6%), A- (4%), B- (4%), AB- (2%) respectively

The study observed that fever was most common symptom (94%), followed by loss of appetite (60%), headache (56%), Nausea and vomiting (54%) ,body pain (52%),abdominal pain (38%), Cough (20%), cold and chills (20%), and rashes(20%), Tiredness (18%), Myalgia (12%), and Loss of motion (10%).This result was similar to study conducted by Anand et al[14], revealed that most of the participant were presented with Fever, loss of appetite, headache, vomiting and loose stools

Among the various laboratory parameters, Thrombocytopenia was the most frequently noticed abnormality (78%) and a small proportion showed normal platelet count. Nearly three fourth of the children had Leukopenia (62%), and Anemia (56%).In our study, the majority of the patients were positive for NS1 (78%) followed by IgG & IgM. This result was similar to study conducted by Khan et al[15] majority were positive for NS1 antigenfollowed by IgG and IgM

There is no specific medication to treat dengue, WHO recommends fluid therapy consisting oral fluids and electrolyte therapy along with bed rest for patients with dengue fever. Majority of the of population was treated with IV fluids (100%), Anti pyretic(100%), Proton pump inhibitor's (100%) Anti-emetics (54%) and Anti-histamines (40%). And minority of population are treated with antibiotics (10%), Anti –diarrheal (10%) and platelet transfusion (8%).

CONCLUSION

Early diagnosis, accurate assessment and appropriate treatment as per national guideline based on WHO protocols may reduce the high mortality rate. The socio-demographic result obtained from this study shows that 11-15 years old O+ve male patients are most predominantly affected by dengue. The most common

clinical manifestation was fever and loss of appetite. We also observed Thrombocytopenia and NS1+ in Dengue patients were more prevalent in this study. The majority of the individuals were treated with IV fluids and Anti-pyretics. Awareness of health care professional & public regarding preventive strategies is important to fight against this disease. The preventive measure of dengue fever includes using mosquito repellent, wear long sleeved shirts and pants and avoiding stagnant water and a wide awareness program.

REFERENCES

1. World Health Organization. Dengue: Guidelines for Diagnosis, Treatment, Prevention and Control - New Edition. Geneva: World Health Organization.
2. Srinivasa K, Ajay J, Manjunath GA. Clinical profile and outcome of dengue among hospitalized children - a single centre prospective study. J PediatrRes 2017; 4 (02): 145-50.
3. World Health Organization and Special Programme for Research and Training in Tropical Diseases. Dengue: Guideline for Diagnosis, Treatment, Prevention and Control. France: World Health Organization; 2009.
4. World Health Organization and Special Programme for Research and Training in Tropical Diseases. Handbook for Clinical Management of Dengue. Geneva, Switzerland: © World Health Organization, WHO Press, World Health Organization; 2012.
5. World Health Organization and the Special Programme for Research and Training in Tropical Diseases (TDR). Dengue: Guidelines for Diagnosis, Treatment, Prevention and Control. Geneva, Switzerland: First edition. A Joint Publication of the World Health Organization (WHO) and the Special Programme for Research and Training in Tropical Diseases (TDR); 2009.
6. Wilder-Smith A, Schwartz E. Dengue in travelers. N Engl J Med 2005; 353: 924-32.
7. Chan HB, How CH, Ng CW. Definitive tests for dengue fever: When and which should I use? Singapore Med J 2017; 58: 632-5.
8. Chaterji S, Allen JC Jr, Chow A, Leo YS, Ooi EE. Evaluation of the NS1 rapid test and the WHO dengue classification schemes for use as bedside diagnosis of acute dengue fever in adults. Am J Trop Med Hyg 2011; 84: 224-8.
9. Nguyen NM, Tran CN, Phung LK, et al. A randomized, double-blind placebo-controlled trial of balapiravir, a polymerase inhibitor, in adult dengue patients. J Infect Dis. 2011
10. Simmons CP, Farrar JJ, Nguyen v, et al. Dengue. N Engl J Med. 2012; 366: 1423–1432.
11. World Health Organization. Dengue: Guidelines for Diagnosis, Treatment, Prevention and Control - New Edition. Geneva: World Health Organization; 2009.
12. Shubhankar Mishra, Ramya Ramanathan, Sunil Kumar Agarwalla, "Clinical Profile of Dengue Fever in Children: A Study from Southern Odisha, India", Scientifica, vol. 2016, Article ID 6391594, 6 pages, 2016.
13. Astuti EP, Dhewantara PW, Prasetyowati H, Ipa M, Herawati C, Hendrayana K. Paediatric dengue infection in Cirebon, Indonesia: a temporal and spatial analysis of notified dengue incidence to inform surveillance. Parasit Vectors. 2019 Apr 29; 12(1): 186.
14. Dr. Anand R, Dr. Selva Kumar L, Dr. Benjamin Sagayaraj, Dr. BalammaSujatha, Dr. Porchelvan. A study of clinical and laboratory profiles of dengue fever in children. Pediatric Rev: int j pediatrics res [Internet]. 2018Apr.30 [cited 2022Feb.24]; 5(4): 230-6.
15. Khan, M.A.S., Al Mosabbir, A., Raheem, E. et al. Clinical spectrum and predictors of severity of dengue among children in 2019 outbreak: a multicenter hospital-based study in Bangladesh. BMC Pediatr 2021;21:478.

Source of Support: The author(s) received no financial support for the research, authorship, and/or publication of this article.

Conflict of Interest: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.