

Diagnostic and Clinical Profile of Dengue Fever Patients in a Tertiary Care Centre with Limited ResourcesTarun Kumar¹, Sanjeev Kumar²¹Senior Resident, Department of Paediatrics, BMIMS, Pawapuri, Nalanda, Bihar, India²Assistant Professor, Department of Pediatrics, BMIMS, Pawapuri, Nalanda, Bihar, India

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Conflict of interest: Nil

Abstract:**Objective:** The study aimed to investigate the clinical and diagnostic profile of Dengue fever in a resource-limited setting, focusing on different age groups and their living environments.**Material and Methods:** In this study, a cohort of 50 patients diagnosed with Dengue fever was examined to explore the clinical and diagnostic profile of the disease in a resource-limited healthcare environment. The study was conducted at BMIMS, Pawapuri (Nalanda) Bihar, India and the duration of the study was one month, starting from July 2023 to August 2023. Patients were categorized into three age groups: 5-7 years (Group 1), 8-10 years (Group 2), and 11-14 years (Group 3), allowing for age-specific analysis.**Result:** Among the 50 patients, the majority were above 10 years old, with children in rural areas experiencing a higher incidence of Dengue fever. The most prevalent symptoms included nausea, itching, and headache, while high fever (temperature >101°F), coughing, and rash was also common. Age-specific patterns revealed variations in symptom presentation, with erythema more frequent in patients aged 11 and above.**Conclusion:** In conclusion, the research provides valuable insights into the clinical and diagnostic aspects of Dengue fever in a resource-limited setting. Nausea, itching, and headaches were the most prevalent symptoms among the patients. High fever was also a common symptom.**Keywords:** Dengue Hemorrhagic Fever, Dengue, Rural Areas.

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Introduction

Dengue fever, caused by the dengue virus, is a vector-borne viral infection that has emerged as a global public health concern. The dengue virus consists of four encapsulated, single-stranded RNA serotypes (DEN-1, DEN-2, DEN-3, and DEN-4) within the Flaviviridae family [1]. While primary infection with one serotype often confers lifelong immunity, secondary infection with a different serotype can lead to the more severe and potentially life-threatening condition known as Dengue Hemorrhagic Fever (DHF) [2]. DHF has become a pressing global issue due to its increased virulence [2]. The epidemiology of dengue has evolved over time, affecting its geographical spread, viral strains, and disease severity.

The clinical presentation of dengue fever follows a triphasic pattern, with the febrile phase being the initial stage. During this phase, patients typically experience symptoms such as high fever, muscle pain, general discomfort, vomiting, a transient rash, and mild bleeding manifestations, including petechiae and venipuncture site bleeding. In the subsequent critical phase, there is an elevated risk of patients progressing to severe dengue,

characterized by plasma leakage leading to shock, fluid accumulation (e.g., ascites or pleural effusion), severe bleeding, and organ dysfunction [5,6]. Secondary infections substantially increase the risk of severe bleeding, affecting around 2-4% of such cases [6, 7]. Early detection of DHF onset can be achieved through the presence of the NF1 antigen, a common glycoprotein in all strains, and serology testing, which involves the detection of specific antibodies or antigens in a patient's blood serum [7].

Serological tests play a crucial role in diagnosing dengue and understanding the immune response to the virus. These tests include the detection of IgM antibodies, which appear early in the infection, and IgG antibodies, which develop several weeks after infection and persist as evidence of past exposure [8]. IgM antibodies appear early in the infection and can be detected within a few days of symptom onset. It is produced after almost 5 days of infection in both secondary and primary cases. IgG antibodies develop after 3-4 weeks of infection and remain in the blood for an extended period, providing evidence of past exposure [8].

This research focuses on investigating the clinical and serological aspects of Dengue fever among patients in a resource-limited private hospital. The primary objective of this study is to examine the symptoms associated with Dengue and analyze the results of serological tests conducted on the affected patients, shedding light on the unique challenges and characteristics of the disease in this specific healthcare setting.

Materials and Methods

Study Design: This research was conducted at BMIMS, Pawapuri (Nalanda) Bihar, India and the duration of the study was one month, starting from July 2023 to August 2023. Patients enrolled in the research were selected through the inclusion exclusion criteria.

Sample and Sampling Criteria: A total of 50 patients were taken into consideration. Patients within the age group of 5 to 14 year old were included. The patients with confirmed Dengue Fever tested with Rapid Dengue test or by ELISA were taken into consideration. Patients with immunological diseases like "HIV Seropositivity" and "malnutrition" were excluded. Patients with frequent history of "Malaria", "Tuberculosis" and "Enteric fever" were excluded from the study.

Data Collection: Patients with Dengue were tested with Antibody test for IgM and IgG with ELISA method of detection. Patients presenting from emergency and OPD were included. 20% of the patients in the study were admitted. A detailed

document was shared with the parents and consent forms were signed before the research. At the beginning of the research, symptoms, examination and vitals were recorded in a proforma and were updated at regular intervals. Patient's living conditions whether rural or urban Symptoms like nausea, abdominal pain, headache, convulsions and cough were included in the examination and recorded. Complete Blood profiling was done which included- platelet count and complete blood count. For the infected patient's complete liver profiling, blood sugar levels, electrolyte levels, abdominal Xray and radiography were tested and recorded. All this data was recorded and maintained for the entire study. Analysis of the symptoms and diagnosis was done to conclude the research.

Results

A total of 50 patients were taken into the study, who were diagnosed with Dengue Fever. Patients were divided into 3 age groups: 5 to 7 years old as Group 1, 8 to 10 years old as Group 2 and 11 to 14 years old as Group 3 respectively. Mean fever for each group was noted. Symptoms such as Itching, rash, cough, abdominal pain, Malena, bleeding manifestations, nausea, loose motions, difficulty in breathing, convulsions etc. were diagnosed and noted. The frequency of each symptom was recorded to analyze its frequency according to their age groups.

Table 1: Living environment of patients of different age groups -

	Group 1 Age (5-7) years old	Group 2 Age (8-10) years old	Group 3 Age (11- 14) years old
Urban Population	7	7	12
Rural Population	5	9	10
Total	12	16	22

Table 1 represents the distribution of patients and their living surroundings, whether they belong to a rural population or an urban population. The numbers obtained claim that 52% of the patients belong to the Rural background and 48% belong to the Urban background.

Table 2: Symptoms Evaluation

Symptoms	(5-7) years old	(8-10) years old	(11-14) years old	Total (50)
Fever with Rigers	NIL	8	14	22
Erythema (rash)	10	9	18	27
Abdominal Pain	NIL	4	22	26
Joint Pain	NIL	3	22	25
Coughing	7	12	19	38
Difficulty in Breathing	3	NIL	14	17
Rectal Bleeding	2	6	NIL	8
Headache	12	16	22	40
Malena	NIL	1	10	11
Hematuria	1	1	1	3
Nausea	10	14	20	44
Convulsion	12	3	4	19
Loose Motion	3	6	10	29
Itching	11	10	19	40
Temp>101°F	6	1	7	15
Temp<101°F	6	14	15	35

Table 2 represents all symptoms that were observed during the study. The most common symptoms according to the records are- Nausea, Itching, Headache. Majority of the Patients experienced High fever, where temperature is greater than 101°F. Loose motion, coughing and Rash all over the body was also common among the patients.

A total of 50 patients were enrolled in the study of Diagnosis and Clinical profiling of Dengue patients in limited resource area. The most common age group affected was more than 10 years. Children in the rural areas are more affected. High fever more than 101°F was less commonly seen. Rash was seen in all ages but most commonly in patients with 11 years and above. Pain in abdomen is more seen in children more than 11 years with respiratory symptoms. Thrombocytopenia has no relation to severity of the disease as observed in the study. Normal platelet counts were more commonly found. Increased hematocrit was not a significant finding among the patients.

Discussion

The study aimed to investigate the clinical and diagnostic profile of Dengue fever in a resource-limited setting, considering different age groups and the living environments of the patients. The analysis of the data yielded several significant observations. The age distribution of the 50 patients revealed that the majority of those affected were above 10 years old [1, 2]. Among these age groups, children residing in rural areas were more severely impacted, with the 11- to 14-year-old age group showing the highest number of cases. This suggests that Dengue fever may have a more significant presence in rural environments compared to urban settings, potentially due to variations in mosquito exposure and living conditions which aligns with the research conducted by WHO [4].

The comprehensive evaluation of symptoms common in Dengue fever unveiled some interesting trends. Nausea, itching, and headaches were the most prevalent symptoms among the patients. High fever, defined as a temperature exceeding 101°F, was also a common symptom, although a noteworthy percentage of patients exhibited temperatures below 100°F. Additional frequently reported symptoms included coughing, rash, abdominal pain, and loose motions. Earlier studies have proven the same with regards to Dengue fever. These studies mention the common rise in the temperature in children and their age groups [3, 4]. Age-specific analysis revealed variations in symptom presentation. Erythema (rash) was more frequently observed in patients aged 11 and above, suggesting a potential correlation between age and the manifestation of this symptom. Abdominal pain, commonly associated with respiratory symptoms, was predominantly seen in older

children (11-14 years), indicating age-related patterns in symptomatology [3, 4].

Thrombocytopenia, often considered a hallmark of Dengue fever, did not consistently correspond to the severity of the disease in this study. Normal platelet counts were more common than low counts, challenging the traditional association between low platelet counts and severe Dengue infection. Similarly, increased hematocrit, a sign of hemoconcentration, was not a significant finding among the patients, further complicating the relationship between hematocrit levels and disease severity, these observations were common with the earlier studies conducted by researchers [6-8]. These findings emphasize the importance of recognizing the diversity in clinical presentations of Dengue fever, particularly regarding different age groups. The research gives insights on how Dengue fever affects children differently based on their age [9]. It is crucial to note that this study was conducted in a resource-limited setting.

The limitations in resources may impact the availability and accessibility of diagnostic tests and treatments, potentially influencing the outcomes of Dengue cases. Healthcare providers in such settings may face additional challenges in diagnosing and managing Dengue cases, and these resource constraints warrant further consideration and support.

Conclusion

In conclusion, the research provides valuable insights into the clinical and diagnostic aspects of Dengue fever in a resource-limited setting. Nausea, itching, and headaches were the most prevalent symptoms among the patients. High fever, defined as a temperature exceeding 101°F, was also a common symptom. Other commonly reported symptoms included cough, skin rash, abdominal discomfort, and diarrhea. Contrary to the conventional belief that severe Dengue infection is associated with low platelet counts, it was found that normal platelet counts were more prevalent than low counts. These findings align with previous research conducted by other scientists. The results highlight the significance of age and living environment in shaping symptom patterns and emphasize the necessity for customized approaches to diagnosis and treatment in healthcare settings with limited resources.

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