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# An Analysis of Clinical Profile of Dengue Feverin a Tertiary Care Hospital

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**ABSTRACT**
Introduction: Dengue fever is a mosquito-transmitted viral disease that has become a significant public health challenge in India, frequently causing epidemics with considerable morbidity and mortality. This disease poses a risk to approximately 25% of the global population, particularly in tropical and subtropical regions.
Aim: The objective of this study was to assess the epidemiology, clinical and biochemical characteristics, radiological findings, and prognosis of dengue fever, with the goal of identifying more effective indicators for diagnosing the disease in patients.
Material & Methods: This prospective study was conducted between August and December 2023, focusing on adult patients diagnosed with dengue fever. Diagnosis was confirmed through the detection of NS1 antigen, IgG, and IgM antibodies. A thorough clinical evaluation and relevant investigations were performed on all patients to gather necessary data.
Results: A total of 60 dengue cases were diagnosed, with a higher prevalence in males. The most common symptoms observed included high-grade fever (100%), severe myalgia and headache (90%), arthralgia (90%), vomiting and diarrhea (50%), shortness of breath (17%), abdominal swelling (10%), and hemorrhagic manifestations such as gum bleeding (4%), upper GI bleeding (2%), and hematuria (2%). Hematological abnormalities were noted, including leukopenia (69%), thrombocytopenia (77%), lymphocytosis (38%), eosinopenia (57%), and neutropenia (20%). Blood parameters like packed cell volume (PCV) were abnormal in 33% of cases. Liver function tests (LFT) showed elevated AST levels (93%), increased ALT levels (70%), and a decrease in total protein (67%), while 34% had low serum calcium and 9% showed low phosphate levels. Abnormal findings were also observed in radiological investigations, with 25.5% of patients presenting with sinus bradycardia on ECG, 18.33% with pleural effusion on X-ray, and 11.7% with mild to moderate ascites on ultrasonography.
Conclusion: This study highlights that the presence of high-grade fever, thrombocytopenia, elevated AST and ALT levels, sinus bradycardia on ECG, pleural effusion on X-ray, and ascites on ultrasonography are strongly associated with dengue fever, helping to identify key indicators for diagnosis and prognosis in affected patients.

## I. INTRODUCTION

Dengue fever, a viral illness transmitted by mosquitoes, poses a significant public health challenge in India, where it leads to recurrent epidemics with substantial morbidity and mortality. Over the past three decades, the global spread of dengue has increased significantly (1). The dengue virus (DV), a member of the Flaviviridae family, exists in four serotypes: DV-1, DV-2, DV-3, and DV-4. It is a positive-sense, single-stranded RNA virus, with three structural proteins: the core (C) protein, the membrane (M) protein, and the envelope (E) glycoprotein, alongside seven nonstructural proteins. The virus is primarily transmitted by the Aedesaegypti mosquito, though Aedesalbopictus is also a vector (2). The World Health Organization (WHO) estimates that approximately 3 billion people are at risk of contracting dengue each year. From 2018 to 2023, India reported over 800,000 cases, with 1,132 deaths attributed to the disease, according to the National Centre for Vector Borne Diseases Control (NCVBDC) (3).

Dengue manifests in various forms, which can be challenging to distinguish from other tropical fever-related infections (4). Transmission from human to mosquito occurs just before the onset of fever and continues for several days during the viremia phase, typically lasting until day six of illness. During this phase, when a female mosquito bites an infected person, the virus undergoes replication in the mosquito, with an incubation period of 8-12 days (5). After the incubation phase, dengue fever usually presents with a sudden onset of fever lasting between 2 to 7 days. Associated symptoms may include muscle and joint pain, loss of appetite, sore throat, headaches, and a maculopapular rash (4,5).

The clinical spectrum of dengue varies from the mild form, known as dengue fever (DF), to more severe manifestations such as Dengue Hemorrhagic Fever (DHF) and Dengue Shock Syndrome (DSS), the latter involving internal bleeding, hypovolemic shock, plasma leakage, and sometimes organ failure, such as encephalopathy (6). Common laboratory findings in dengue include leukopenia, thrombocytopenia, and abnormalities in liver and renal function tests (LFT and RFT). This study aims to assess the major changes observed in complete blood counts (CBC), biochemical reports, 12-lead ECG, X-ray, and ultrasonography in patients with dengue fever, thereby enhancing clinicians' ability to identify dengue cases early and recognize potential laboratory indicators of disease progression.

## II. MATERIALS AND METHODS

A prospective analysis was conducted on all patients admitted to the Department of General Medicine at Hi-Tech Medical College and Hospital, Bhubaneswar, with a suspected diagnosis of Dengue Fever, from August 2023 to December 2023. The study included a sample size of 60 patients, ranging in age from 18 to 65 years, who exhibited at least two symptoms commonly associated with dengue, such as high-grade fever, severe myalgia, headache, and arthralgia. Each patient underwent laboratory tests, including NS1 antigen, IgG, and IgM, to confirm dengue infection. Those who tested negative for dengue were excluded from the study. Additionally, patients with a history of chronic kidney disease or chronic hepatitis were not included.

Upon admission, data were collected for each patient, including demographic information (name, address, age, and sex), clinical features, blood pressure, and relevant medical history. A thorough physical examination was conducted, and laboratory investigations were performed, including complete blood count (CBC), liver function tests (LFT), renal function tests (RFT), ECG, X-ray, and ultrasonography. All findings were systematically recorded.

Throughout the treatment period, patients' symptoms were closely monitored and documented on a daily basis. These symptoms ranged from fever and headache to more severe conditions such as myositis and myocarditis, which were managed and treated accordingly. Treatment details, including any medication administered for dengue, were carefully documented in a pre-established format.

Management: During the study period, all 60 patients were admitted to the designated facilities, where they received continuous care and monitoring. Patients with a platelet count (TPC) below 30,000 and presenting with ascites, pleural effusion, or hemorrhagic symptoms (50% of the cohort) received symptomatic treatment along with recombinant platelet transfusion (RDP). The remaining 50% of patients were treated with intravenous (IV) fluids alongside symptomatic care.

Ethics: Ethical approval for the study was obtained from the institution's ethics committee, and written informed consent was collected from all participating patients prior to their inclusion in the study.

Statistics: Statistical analysis was performed using Microsoft Excel 2021. Descriptive statistics, including mean and standard deviation, were used to analyze quantitative data, while frequency and proportion were applied to categorical variables.

## III. RESULTS

All 60 patients in the study were clinically diagnosed with dengue fever. The cohort consisted of 8 women and 52 men, with a predominantly male population. The patients were categorized into three age groups: 18–30 years, 30–50 years, and >50 years (Figure 1). The average age of the patients was 37.5 years (SD 11.2).

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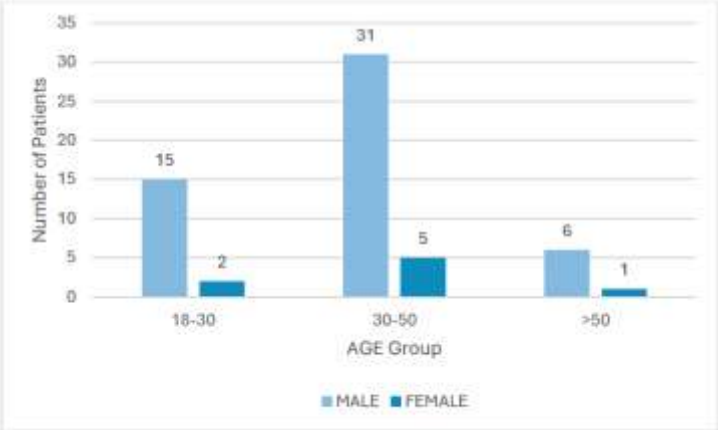


**Figure 1:** Age & sex distribution

Several significant clinical symptoms were observed in the cohort(Figure 2). High-grade fever was reported in all 60 patients (100%), while 54 patients (90%) experienced severe myalgia and headache, and 54 patients (90%) also had arthralgia. Additionally, 30 patients (50%) reported vomiting and diarrhea, 10 patients (16.67%) experienced shortness of breath, and 6 patients (10%) had abdominal swelling. Other manifestations included hemorrhagic symptoms, with 6 patients (10%) exhibiting petechiae, and 2 patients (3.33%) each developing subconjunctival hemorrhage and gum bleeding. One patient (1.67%) had upper gastrointestinal bleeding, and another (1.67%) experienced hematuria.

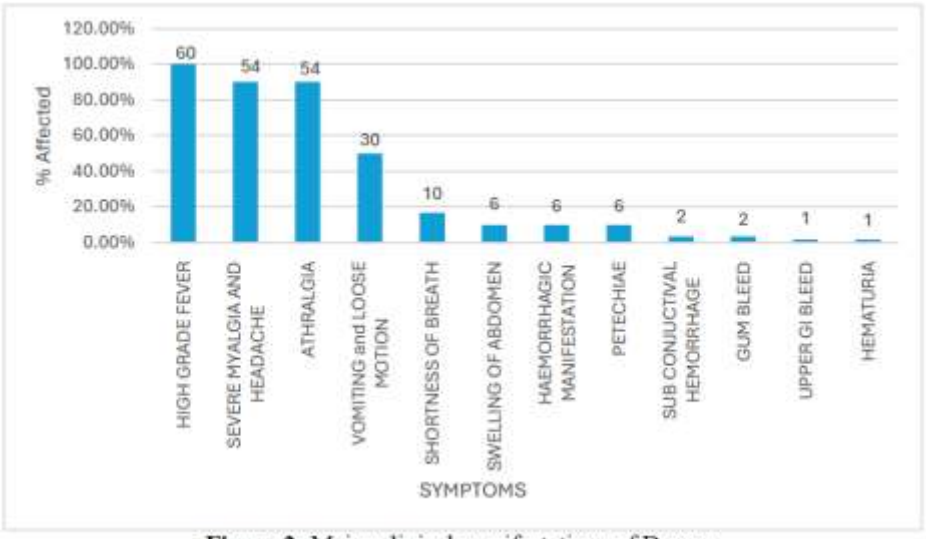


**Figure 2:** Major clinical manifestations of Dengue

Hematological abnormalities were commonly observed in the complete blood count (CBC) results(Figure 3). Leukopenia was present in 41 patients (68.33%), with a mean decrease in leukocyte count of 657.07 (SD 598.44). Thrombocytopenia was noted in 46 patients (76.67%), with a mean decrease in platelet count of 66,680.85 (SD 46,831.38). Lymphocytosis was seen in 23 patients (38.33%), with a mean increase in lymphocyte count of 50.90 (SD 14.48). Eosinopenia was observed in 34 patients (56.67%), with a mean reduction in eosinophil count of 0.75 (SD 0.28). An increase in neutrophils was found in 12 patients (20%), with a mean increase of 6.29 (SD 6.38). A rise in packed cell volume (PCV) was noted in 20 patients (33.33%), with a mean increase of 1.93 (SD 1.33).

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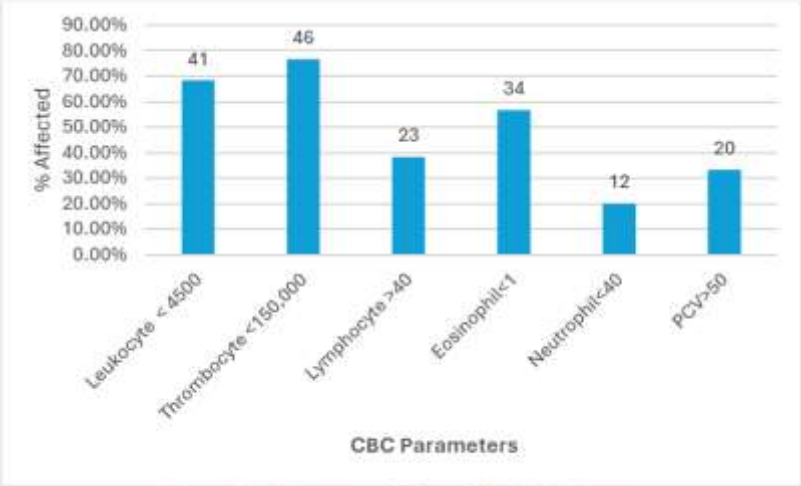


**Figure 3:** Dengue relation with CBC Report

Biochemical abnormalities were detected in liver and renal function tests (LFT and RFT). Aspartate aminotransferase (AST) levels were elevated in 56 patients (93.33%), with a mean increase of 140.75 (SD 78.45). Alanine aminotransferase (ALT) levels were elevated in 42 patients (70.00%), with a mean rise of 87.93 (SD 35.68). Total bilirubin was elevated in 6 patients (10.00%), with a mean increase of 1.53 (SD 0.23). A decrease in protein levels was observed in 40 patients (66.67%), with a mean reduction of 0.44 (SD 0.30). Serum calcium levels were reduced in 50 patients (83.33%), with a mean decrease of 0.75 (SD 0.40), and serum phosphate was decreased in 20 patients (33.33%), with a mean drop of 0.32 (SD 0.17).

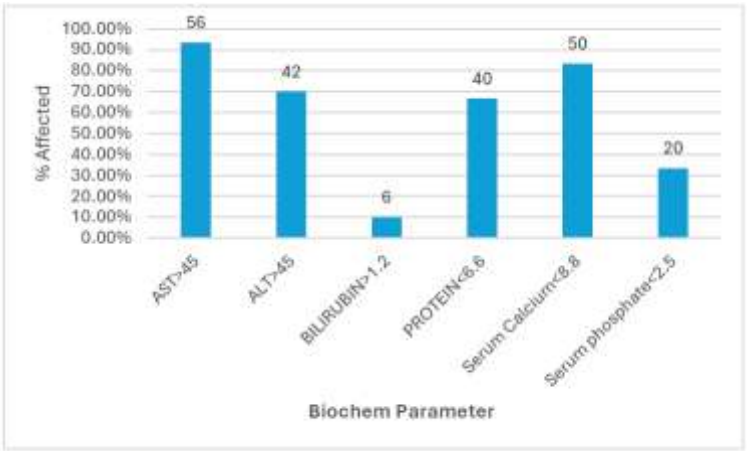


**Figure 4:** Dengue relation with Biochem Reports

Electrocardiogram (ECG), X-ray, and ultrasonography findings also revealed notable abnormalities(Figure 5). Sinus bradycardia was observed in 15 patients (25.00%). X-ray results indicated mild to moderate bilateral pleural effusion in 13 patients (21.67%), while 8 patients (13.33%) had unilateral pleural effusion. Ultrasonography revealed mild to moderate ascites in 7 patients (11.67%).

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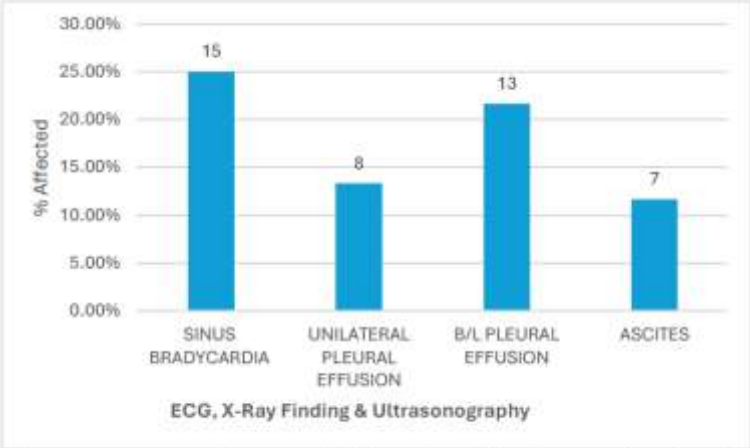


**Figure 5:** Dengue relation with ECG, X-ray & Ultrasonography Reports

## IV. DISCUSSION

The present study provides an overview of the clinical profile, laboratory characteristics, and outcomes of dengue fever (DF) in adult patients. Gastrointestinal symptoms, particularly abdominal discomfort, were notably prevalent, with 50% of patients in this study reporting such symptoms, compared to 38% in the study by Sharma et al. (7). Bleeding manifestations, however, were less frequent in this cohort, affecting only 5% of patients. This contrasts with studies by Horvath in Australia (8) and Sharma in India (7), where bleeding occurred in 63% and 69% of cases, respectively. In the current study, bleeding was primarily observed in the gastrointestinal tract and gums, and the relatively low incidence of bleeding manifestations might be attributed to the exclusion of bleeding from venepuncture sites in the study's definition of bleeding tendencies. Additionally, while thrombocytopenia was common, it did not show a strong association with bleeding tendencies, a finding consistent with Sharma et al.'s study (7). In this study, 76.67% of patients experienced thrombocytopenia, which was higher compared to 43.8% in a previous study.

Liver function tests (LFTs) also provided significant comparative insights. Elevated levels of AST and ALT were observed in 97.33% and 70% of patients, respectively, in this study, compared to 88.4% and 76.7% in the study by Sharma et al. (7). Elevated bilirubin levels were noted in 10% of patients in this study, which was slightly higher than the 8.82% reported by Sharma et al. Protein, serum calcium, and serum phosphate levels showed substantial changes in the patients, aligning with deviations seen in renal function tests (RFT). These biochemical abnormalities indicate notable pathophysiological alterations associated with DF.

Regarding other clinical manifestations, 25% of patients in our study presented with bradycardia, a finding similar to that of Gudi Srinivas et al. (9), who reported 24% of cases with bradycardia. There was a significant difference in the incidence of pleural effusion seen on X-ray, with 16.67% of patients in our study affected, compared to 3% in other studies. Similarly, the prevalence of ascites detected via ultrasonography was higher in our study (11.67%) compared to 9.4% in Gudi et al.'s study (10).

The only mortality in this study occurred due to myocarditis, with the remaining 59 patients recovering well. Key findings of this study included the high prevalence of thrombocytopenia and eosinopenia in CBC reports, as well as significant changes in serum calcium, AST, ALT, and protein levels in LFT and RFT results. Effusion and sinus bradycardia were also noted as important markers of the physiological effects of dengue fever.

The primary limitations of this study include its small sample size and potential underreporting of cases that may not have been adequately recognized or reported. However, future research with larger sample sizes could confirm that early diagnosis and prompt treatment in dengue cases could reduce both morbidity and mortality, improving patient outcomes and aiding in quicker recovery.

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