



## ORIGINAL RESEARCH ARTICLE

### STUDY ON CLINICAL PROFILE OF DENGUE IN A TERTIARY CARE HOSPITAL OF NEPAL

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#### ABSTRACT

**Background:** This study was conducted to elucidate the clinical features, laboratory parameters and management outcome of dengue patients admitted in a tertiary care center of Nepal. **Methods:** This was a retrospective descriptive study in dengue patients aged 12 years or more who were admitted in Tropical Wards and Intensive Care Unit of Chitwan Medical College Teaching Hospital (CMCTH), Chitwan, Nepal from November 2016 to December 2017. Diagnosis of dengue was confirmed by positive NS1 antigen or ELISA IgM or both. The required data were retrieved from patient's medical records and laboratory data base. Data analysis was performed by using IBM-SPSS 20. **Results:** Of 60 patients, majority (65%) were male. Forty-one (68.33%) patients were diagnosed by positive NS1 and 18 (30%) were ELISA IgM positive. In the year 2017, highest numbers of cases (20, 33.33%) were in the month of November, followed by 14 cases (23.33%) in October. Similarly, in the year 2016, dengue cases peaked in the month of November. All patients had fever as a presenting complaint. Other common presenting features were myalgia 42 (70%) and headache 32 (53%). Thrombocytopenia was observed in 52 (86.66%) patients followed by leucopenia in 41 (68.33%) cases. Elevation of AST and ALT were found in 45 (75%) and 38 (63.33%) patients respectively. Only 2 patients (3.3%) had dengue with warning signs. Four (6.8%) patients needed platelet transfusion. No mortality was observed. **Conclusions:** Majority of dengue patients had thrombocytopenia, leucopenia, and elevated AST and ALT. Only two patients had dengue with warning signs. Hospital mortality was not documented.

**Key words:** Clinical manifestation, Dengue, Fever, Thrombocytopenia

#### INTRODUCTION

Dengue is a mosquito-borne viral disease that is rapidly spreading in recent years. Dengue virus (DV) is an RNA virus of genus Flavivirus with four serotypes- DV-1, DV-2, DV-3 and DV-4 which is transmitted by bites of female mosquitoes, most commonly by *Aedes aegypticus* and to a lesser extent by *A. albopictus*.<sup>1</sup> All four serotypes were found circulating in Nepal.<sup>2</sup> It is estimated that about 3.97 billion people from 128 countries are at risk of infection with dengue virus.<sup>3</sup> The clinical presentations of dengue ranges from acute undifferentiated febrile illness, classic dengue fever to dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS).<sup>4</sup> During the last decade, there are reports of increasing number of dengue patients in South Asia.<sup>5-8</sup>

The first case of dengue in Nepal was reported in 2004 in Chitwan, Southern Terai district of Nepal<sup>9</sup>. Since then it has been found to be increasingly diagnosed from different parts of the country. In 2010, there were 917 confirmed cases of Dengue mainly from Chitwan, and Rupandehi districts situated in southern part of Nepal bordering India.<sup>10</sup> The occurrence of dengue fever in Nepal is high during rainy season, between July and December.<sup>11</sup> It was also reported that nearly 10% of the dengue patients had developed dengue hemorrhagic fever and or warning signs.<sup>12</sup> Dengue has been recognized as an emerging disease and one of the causes of acute undifferentiated febrile illnesses. Only a handful of studies have been conducted and most of them are limited to serological and demographical findings.<sup>13-16</sup> Limited data are available on clinical

features, laboratory parameters and outcomes of patients with dengue from Nepal. Therefore, this retrospective study aimed to report the clinical features, laboratory parameters and management outcome in adult dengue patients admitted in medical ward and intensive care unit of Chitwan Medical College, Chitwan, Nepal.

**METHODS**

This was a retrospective descriptive study carried out in dengue patients admitted and treated in in Tropical Wards and Intensive Care Unit of Chitwan Medical College Teaching Hospital (CMCTH), Chitwan, Nepal from November 2016 to December 2017. CMCTH is a 750-bedded multispecialty tertiary care hospital situated in southern part of Nepal. Ethical approval was taken from Ethical Review Committee of the Chitwan Medical College. All inpatients aged 12 years or more with diagnosed dengue by positive NS1 antigen or ELISA IgM or both were included in the study. Patients with dengue not requiring hospital admission or those co-infected with malaria, scrub typhus and influenza were excluded. Patients presenting within 5 days of onset of symptoms had NS1 antigen tested and ELISA IgM was done in the patients presenting after 5 days.

Patients were identified from registry of Tropical Wards and Intensive Care Unit, and their demographic, clinical information and the details of management within the hospital were retrieved from patients’ medical records. Laboratory information (total and differential leucocyte count, platelet count, urea, creatinine and transaminases) including diagnostic test reports- NS1 antigen and ELISA IgM were extracted from electronic data base. Structured proforma prepared by reviewing literature were filled. The patients were categorized into dengue fever (DF), dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS) according to the World Health Organization (WHO) severity grading scale.<sup>4</sup>

Categorical variables were expressed in frequency (%) and median [interquartile range (IQR)] were calculated for numeric variables. Data analysis was performed by using IBM-SPSS 20.

**RESULTS**

Of 60 dengue patients, majority (39, 65%) were

male. Forty-one (68.33%) patients were diagnosed by positive NS1, 18 (30%) were ELISA IgM positive and one (1.66%) was positive for both. The median age [Interquartile Range (IQR)] of the patients was 23.50 (21).

There were 13 cases in November 2016. In the year 2017, highest numbers of cases (20, 45%) were in the month of November followed by 14 cases (32%) in October 2017 (Figure 1).

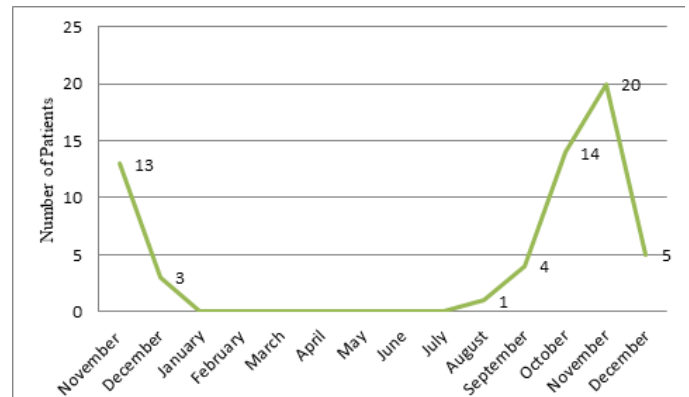


Fig 1: Month wise presentation of Dengue fever patients from November 2016-December 2017

The clinical findings of the patients are detailed in table 1. All patients had fever as a presenting complaint. Other common complaints were myalgia 42 (70%), headache 32 (53%) and nausea and vomiting 26 (43%). Anorexia 6 (16.66%), retro-orbital pain 7 (11.66%), and cough 4 (8.33%) were also documented. Only one patient underwent tourniquet test on suspicion of dengue hemorrhagic fever, which was positive.

**Table1: Clinical Features of Patients Presented with in Dengue Fever**

Clinical Features	n (%)
Fever	60 (100%)
Myalgia	42 (70%)
Headache	32 (53%)
Nausea/Vomiting	26 (43.33%)
Anorexia	6 (16.66%)
Retro-orbital Pain	7 (11.66%)
Cough	4 (8.33%)
Rash	2 (3.33%)
Abdominal Pain	2 (3.33%)
Torniquet Test Positive	1 (1.66%)

Leucopenia (WBC count <4000/mm<sup>3</sup>), lymphocytosis (lymphocytes >40% of total count) and thrombocytopenia (platelets < 150,000/mm<sup>3</sup>) were found in 41(68.33%), 35(58.33%) and 52 (86.66%) patients respectively. Severe thrombocytopenia (< 50,000/ mm<sup>3</sup>) was found in 18(30%) patients. Leucopenia with lymphocytosis was recorded in 26(63.4%) patients. The hematological parameters are illustrated in table 2.

**Table 2: Hematological Parameters**

Categories		n (%)
Thrombocytopenia (<1,50,000/mm <sup>3</sup> )	Mild (1,00,000-50,000/ mm <sup>3</sup> )	6 (15%)
	Moderate (50,000-90,000/ mm <sup>3</sup> )	28 (46.66%)
	Severe (<50,000/ mm <sup>3</sup> )	18 (30%)
Leucopenia		41 (68.33%)
Lymphocytosis		35 (58.33%)
Leucopenia with Lymphocytosis		26 (63.4%)

Elevation of the liver enzymes aspartate aminotransferase (AST) and alanine aminotransferase (ALT) were found in 45 (75%) and 38 (63.33%) patients respectively.

In this study, 58 patients (96.7%) had dengue without warning signs while only 2 patients (3.3%) had dengue with warning signs. Only 1 patient (1.66%) met the criteria for dengue hemorrhagic fever. All the patients received intravenous fluid therapy and antipyretics. Among 60 patients, only 4 (6.8%) patients needed platelet transfusion (platelets count < 10,000/ mm<sup>3</sup> or spontaneous bleeding). No major complications like bleeding, septic shock, organ impairment and mortality were observed in this study population. The median (IQR) duration of hospital stay was 4(2) days.

## DISCUSSION

Dengue has been recognized as one of the important differentials in acute undifferentiated febrile illnesses in Nepal. This study was aimed to find out demographic, clinical, and serological and other laboratory profiles dengue patients admitted to Tropical Wards and Intensive Care Unit of Chitwan Medical College Teaching Hospital.

In present study the male patients with dengue outnumbered the female patients. Similar results have been shown by other studies conducted in Nepal<sup>5,15</sup>, India<sup>17,18</sup> and Pakistan.<sup>19</sup> This could be due to male population being more involved in outdoor work which increases the risk of transmission of the disease. The other reason could be the gender discrimination that still prevails in these countries as females less often seek medical attention. On analysis of seasonal variability, we found the number of dengue patients peaked in October and November. Similar variation was observed in other studies conducted in Nepal<sup>11,16</sup>, but studies conducted in China, India, Pakistan and Bangladesh found August and October to be peaked season for dengue.<sup>5,6, 11,17-19, 21</sup> These observations might indicate that seasonal outbreaks in these countries are closely related and there might be consistent transmission of the disease among these countries.

Fever with myalgia and headache were the most common presenting symptoms in our study. These symptoms were also predominant in studies from Nepal<sup>22</sup>, India<sup>17, 18</sup> Pakistan<sup>6</sup>, and Taiwan.<sup>23</sup> However another study conducted in Nepal<sup>16</sup> and in Pakistan,<sup>19</sup> fever with headache and nausea vomiting were the most predominant features. In addition to that, cough and anorexia were also the observed symptoms in our study which were also observed in other studies conducted in India and Pakistan.<sup>6, 17,19</sup> On the contrary, a recent study from Nepal<sup>16</sup> didn't report such symptoms, instead reported sore throat, hepatomegaly and splenomegaly to be the common findings. Less than one-third of the patients had retro-orbital pain while abdominal pain and rash were less common presentation in our study in comparisons to other studies.<sup>5,16-18</sup> Hemorrhagic manifestations or other complications were not observed in our patient. Thrombocytopenia, leucopenia and elevated liver enzymes (AST and ALT) were observed in our study, which were also mentioned in other studies.<sup>21, 24</sup> On the other hand, leucopenia with lymphocytosis was seen in more than half of the infected patients with dengue which was also seen in one of the studies.<sup>17,19</sup> The treatment and management of dengue illness is supportive with antipyretics and intravenous fluids. One of the studies<sup>25</sup> shows no correlation between platelet transfusions and thrombocytopenia unless there are signs of bleeding. Four of our patients

received platelets transfusion for platelets count < 10,000/mm<sup>3</sup>. The median (IQR) duration of hospital stay of patients was 4 (2). There were no mortality reported in our study, the reasons might be that our patients had primary dengue infection where DHF and DSS were less common or different serotypes were involved.

There are a few limitations in our study. This is a retrospective study with small number of patients in a single center. Diagnosis was confirmed by either antigen test or IgM ELISA but not by other molecular tests to find out the serotypes.

## CONCLUSION

Majority of Patients had thrombocytopenia, leucopenia, and elevated AST and ALT with no hospital mortality. Only two patients had dengue with warning signs. The occurrence of dengue fever was high in the months of October and November. All the patients received intravenous fluid therapy and antipyretics. Hospital mortality was not documented

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