

## Research Article

# A study of clinical and laboratory profile of dengue fever in a tertiary care centre of Uttarakhand, India

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**Received:** 20 October 2013

**Accepted:** 12 November 2013

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## ABSTRACT

**Background:** Dengue is an important cause of mortality and morbidity in India. Many recent studies have shown varied clinical manifestations from different geographical locations. There is paucity of data on this topic from this region. The present study was conducted to find out the clinical features, complications, response to treatment and outcome of patients suffering from dengue in a tertiary care centre of Uttarakhand, India.

**Methods:** The study was performed at SGRR Institute of Medical & Health Sciences, Dehradun, which is a tertiary care hospital of Uttarakhand. The study period was of 1 year from July 2012 to June 2013. Patients of 12 years of age or above who were antigen positive or antibody positive were included in the study. All such patients who were admitted in the hospital underwent detailed clinical examination and investigation.

**Results:** Dengue infection was identified in 140 patients. Thrombocytopenia was the commonest hematological abnormality. Splenomegaly, hepatomegaly, and hepatosplenomegaly, were common findings. Renal, hepatic and cerebral dysfunctions were noted. Mortality was seen in 5 (3.6%) patients. Encephalitis, shock and ARDS were associated with high mortality and poor outcome.

**Conclusions:** Dengue is an important cause of mortality and morbidity in Uttarakhand. High index of suspicion, early diagnosis, monitoring of the clinical and laboratory parameters and prompt intervention may help in reducing the mortality.

**Keywords:** Dengue, Clinical manifestations, Laboratory profile, Uttarakhand

## INTRODUCTION

Dengue has recently become a major public health problem causing significant morbidity, mortality and economic loss. Dengue is endemic in more than 100 countries. Worldwide around 2.5 billion people live in dengue prone regions and about 100 million new cases are detected each year.<sup>1</sup> The WHO 2009 classification divides dengue fever into two groups: uncomplicated and severe;<sup>2</sup> though the 1997 WHO classification is still widely used, classifying dengue in to 3 groups: dengue fever (DF), dengue hemorrhagic fever (DHF) and dengue

shock syndrome (DSS).<sup>3,4</sup> The resurgence of dengue has been observed in India and varied clinical presentations are being reported in the outbreaks reported from different geographical locations.<sup>5-11</sup>

## METHODS

This prospective study was performed at SGRR Institute of Medical & Health Sciences, Dehradun, which is a tertiary care hospital of Uttarakhand. The centre receives patients from Uttarakhand and adjacent parts of Uttar Pradesh and Himachal Pradesh, India. The study period

was of 1 year from July 2012 to June 2013. The consenting patients of 12 years of age or above it who were antigen positive or antibody positive were included in the study. All such patients who were admitted in the hospital underwent detailed clinical examination and investigation. Platelet transfusion was given when the platelet count fell below 20,000/cu.mm. or thrombocytopenia was associated with bleeding.

## RESULTS

Of the 140 patients 80 (57.1%) were male and 60 (42.9%) were female (Table 1). Majority patients were of younger age group. Fever was noted in all 140 (100%) patients. There was clustering of cases during monsoon and post monsoon period. Maximum cases were observed from September to November (Table 2). Fever was present in all 140 (100%) patients (Table 3). Headache was complained by 112 (80.0%), myalgia was complained by 103 (73.6%) patients. Petechiae was seen in 21 (15.0%). Gastrointestinal bleed was noted in 10 (7.1%) in the form of malena. 9 (6.4%) patients had diarrhea and 16 (11.4%) had vomiting. Abdominal pain was present 19 (13.6%), Jaundice was noted in 24 (17.1%), Seizure was noted in 12 (8.9%) while 14 (10.0%) were unconscious. 3 (2.1%) developed ARDS, 6 (4.2%) developed shock. 26 (18.6%) had sore throat. 70 (50.0%) patients reported difficulty in falling asleep and maintaining sleep. Itching was reported by 18 (12.9%) patients. Thrombocytopenia was commonest hematological finding, noted in 136 (97.1%) patients (Table 4). Severe thrombocytopenia (<50,000 / cu. mm) was noted in 38 (27.1%). Average platelet count was 40,000/cu.mm. These findings were similar to another study conducted in Lucknow where average platelet count was found to be 35,000/cu.mm.<sup>12</sup> 58 (41.4%) patients were leucopenic. Deranged liver functions were observed as raised serum bilirubin (> 2.0 mg/dl) in 21 (15.0%), raised SGOT in 112 (80.0%) and raised SGPT in 58 (41.4%). Raised Serum creatinine (> 1.5 mg/dl) was noted in 10 (7.1%) patients. Hepatomegaly was noted in 61 (43.6%), splenomegaly in 42 (30.0%), ascites in 54 (38.6%) and pleural effusion and edema of the wall of gall bladder in 18 (12.9%) patients (Table 5). 5 (3.6%) patients died (Table 6). Causes of death were shock, ARDS, encephalitis and myocarditis.

**Table 1: Age and sex wise distribution of dengue cases.**

Age group	Male	Female	Total
12-20	19 (13.6%)	14 (10.0%)	33 (23.6%)
21-30	20 (14.3%)	17 (12.1%)	37 (26.4%)
31-40	16 (11.4%)	14 (10.0%)	30 (21.4%)
41-50	15 (10.7%)	12 (8.6%)	27 (19.3%)
51-60	9 (6.4%)	3 (2.1%)	12 (8.6%)
61-70	1 (0.7%)	0 (0.0%)	1 (0.7%)
Total	80 (57.1%)	60 (42.9%)	140 (100%)

**Table 2: Month wise distribution of dengue cases.**

Month	Number (%)
January	1 (0.71%)
February	0 (0.0%)
March	0 (0.0%)
April	0 (0.0%)
May	0 (0.0%)
June	2 (1.4%)
July	8 (5.7%)
August	19 (13.6%)
September	38 (27.1%)
October	35 (25.0%)
November	28 (20.0%)
December	9 (6.4%)
Total	140 (100.0%)

**Table 3: Clinical manifestations in dengue cases.**

Criteria	No. of cases (n =140)
Fever	140 (100%)
Headache	112 (80.0%)
Myalgia	103 (73.6%)
Petechiae	21 (15.0%)
Gastrointestinal bleed	10 (7.1%).
Jaundice	24 (17.1%)
Diarrhea	9 (6.4%)
Vomiting	16 (11.4%)
Abdominal pain	19 (13.6%)
Seizure	12 (8.9%)
Unconsciousness	14 (10.0%)
ARDS	3 (2.1%)
Shock	6 (4.2%)
Sore throat	26 (18.6%)
Insomnia	70 (50.0%)
Itching	18 (12.9%)

**Table 4: Hematological and biochemical findings in dengue cases.**

Criteria	No of cases (%)
Thrombocytopenia <1.5 Lakh/cu.mm.	136 (97.1%)
Thrombocytopenia <1.0 Lakh/cu.mm.	75 (53.6 %)
Thrombocytopenia <50,000/cu.mm.	38 (27.1%)
Thrombocytopenia <50,000/cu.mm. with bleed	16 (11.4%)
Leukopenia (TLC <4000/cu.mm.)	58 (41.4%)
Serum bilirubin >2.0 mg/dl	21 (15.0%)
SGOT	112 (80.0%)
SGPT	58 (41.4%)
Serum creatinine > 1.5 mg/dl	10 (7.1%)

**Table 5: Ultrasonographic findings in dengue cases.**

Criteria	No of cases (%)
Hepatomegaly	61 (43.6%)
Splenomegaly	42 (30.0%)
Ascites	54 (38.6%)
Pleural effusion	18 (12.9%)
Gall bladder edema	18 (12.9%)

**Table 6: Outcomes in dengue cases.**

Age group	Total	Improved	Mortality
12-20	33 (23.6 %)	33 (23.6%)	0 (0.0%)
21-30	37 (26.4 %)	36 (25.7%)	1 (0.7%)
31-40	30 (21.4%)	29 (20.7%)	1 (0.7%)
41-50	27 (19.3%)	25 (17.9%)	2 (1.4%)
51-60	12 (8.6%)	11 (7.9%)	1 (0.7%)
61-70	1 (0.7%)	1 (0.7%)	0 (0.0%)
Total	140 (100 %)	135 (96.4%)	5 (3.6%)

## DISCUSSION

Severity of dengue infection varies from influenza-like self-limiting illness to life-threatening complications like dengue hemorrhagic fever (DHF) and dengue shock syndrome. Thrombocytopenia in dengue is related to oxidative stress.<sup>13</sup> In our study this was observed in 136 (97.1%) patients. Rashes are commonly observed with

severe thrombocytopenia.<sup>14,15</sup> In this study rashes were observed in 21 (15.0%) patients. Ascites pleural effusion, pericardial effusion and gallbladder wall edema are not uncommon in dengue fever.<sup>16</sup> In our study ultrasonographic evidence of ascites was seen in 54 (38.6%) and pleural effusion and gall bladder edema in 18 (12.9%). No case of pericardial effusion was observed in our study. Hepatomegaly, splenomegaly, ascites and pleural effusion were usually mild, so better detected by ultrasonography. Liver dysfunction is a common feature of dengue and SGOT is usually higher than SGPT.<sup>17-19</sup> This finding was also obvious in our study. Acute kidney injury is uncommon but well recognized complication of dengue fever.<sup>20-22</sup> In our study 10 (7.1%) patients suffered from this complication. Seizures result from CNS involvement in dengue.<sup>23</sup> In our study it was noted in 12 (8.9%) Mortality rate was 3.6% in our study. Another study from Kerala has reported a mortality rate of 3.2 %<sup>9</sup> while mortality as high as 20% has been reported in an earlier study.<sup>24</sup> Rare but serious manifestations of dengue include encephalitis myocarditis, ARDS, shock, liver failure.<sup>7,25-30</sup> In this study also mortality resulted because of these complications. Maximum number of cases is seen in rainy post rainy seasons because of water logging which acts as breeding ground for mosquitoes. This finding is similar to another study done from Kolkata.<sup>11</sup> So preventive measures to control the mosquitoes must be ready at the beginning of monsoon.

## CONCLUSION

Dengue is an important cause of mortality and morbidity in Uttarakhand. It presents with varied clinical manifestations. In view of the increasing burden of dengue on the public health-care system one should have a high index of suspicion. Early diagnosis and prompt intervention may help in reducing the mortality and morbidity.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the institutional ethics committee*

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DOI: 10.5455/2320-6012.ijrms20140232

**Cite this article as:** Singh R, Singh SP, Ahmad N. A study of clinical and laboratory profile of dengue fever in a tertiary care centre of Uttarakhand, India. *Int J Res Med Sci* 2014;2:160-3.