

A study of laboratory profile of dengue patients admitted in tertiary health care center

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Abstract

Background: Dengue is an acute viral infection with potential fatal complications. Laboratory investigations play an important role in management of dengue fever. **Aim and objective:** To study the laboratory profile of dengue patients admitted at a tertiary health care center **Methodology:** Present study was a Prospective, observational study carried out on 60 indoor patients with dengue fever having age group of more than 12 years. Data was collected with pre tested questionnaire. Data included demographic characters, clinical history, clinical examination and investigations. **Results and discussion:** Mean age of the study was 46.5 years. Male to female ratio was 1.33:1. Most commonly observed symptom was fever (approximately-100%), body ache (approximately-56%), chills(approximately-43%), generalized weakness (approximately-23%). The laboratory findings suggest that the dengue fever patient present with thrombocytopenia most commonly and associated with leukopenia.

Key Word: dengue.

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INTRODUCTION

The World Health Organization (WHO) consider dengue as a major global public health challenge in the tropic and sub-tropic nations. Dengue has seen a 30-fold upsurge worldwide between 1960 and 2010, due to increased population growth rate, global warming, unplanned urbanization, inefficient mosquito control, frequent air travel, and lack of health care facilities. Two and a half billion people reside in dengue-endemic regions and roughly 400 million infections occurring per year, with a mortality rate surpassing 5–20% in some areas. Dengue infection affects more than 100 countries, including

Europe and the United States (USA). ¹ The dengue virus, a member of the genus *Flavivirus* of the family *Flaviviridae*, is an arthropode- borne virus that includes four different serotypes (DEN-1, DEN-2, DEN-3, and DEN-4). ² Transmission among human beings occurs by the mosquito *Aedes aegypti* and chiefly occurs during the rainy season ³. Dengue virus infection presents with a diverse clinical picture that ranges from asymptomatic illness to DF to the severe illness of dengue hemorrhagic fever/dengue shock syndrome (DHF/DSS). ⁴ Onset of symptoms is characterized by a biphasic, high-grade fever lasting for 3 days to 1 week. Severe headache (mainly retro-bulbar), lassitude, myalgia and painful joint, metallic taste, appetite loss, diarrhea, vomiting, and stomachache are the other reported manifestations. Dengue is also known as “Breakbone fever” because of the associated myalgia and pain in joints. Of patients with DF, 50–82% report with a peculiar cutaneous rash. ⁵ Dengue virus infection exhibit varied clinical presentation, hence, accurate diagnosis is difficult and relies on laboratory confirmation. A decreased number of white blood cells (leukopenia), accompanied by a decreased number of platelet count (thrombocytopenia) and metabolic acidosis are the initial changes on laboratory examinations. Microbiological

laboratory testing confirms the diagnosis of DF. Virus segregation in cell cultures, nucleic acid demonstration by polymerase chain reaction (PCR), and serological detection of viral antigens (such as NS1) or particular antibodies are the preferred microbiological assays.⁶ Viral segregation and nucleic acid demonstration provide precise diagnosis, although the high cost limits the availability of these tests.

Aim and objective: To study the laboratory profile of dengue patients admitted at a tertiary health care center

MATERIAL AND METHODS

Present study was a Prospective, observational study carried out at a tertiary health care center during October 2017 to October 2019. Study population was all indoor patients with dengue fever having age group of more than 12 years

Inclusion criteria: Patients of both sexes of age more than 12 years, who were willing for admissions and who were positive for Dengue anti-IgM antibody by ELISA and NS1 (Nonstructural-1) antigen positive

Exclusion criteria: 1. Patients of less than 12 years of age, tested negative for dengue anti-IgM antibody by ELISA and NS1 antigen 2. Patients who were not willing for admission. 3. Patient with concomitant malaria, typhoid, leptospirosis.

Study was approved by ethical committee of the institute. A valid written consent was taken from the patients or their guardians after explaining study to them. 60 patients coming to Tertiary care hospital with dengue fever were selected for study. Data was collected with pre tested questionnaire. Data included demographic characters like age, sex etc. Detailed clinical history was taken. A through clinical examination was done. All the patients underwent investigations like Hemoglobin, TLC, Platelet count, hematocrit, Dengue anti-IgM antibody, Dengue anti-IgG antibody and NS1 Antigen, Liver function test(LFTs), Kidney function test (Sr. Urea), Serum creatinine), USG Abdomen, X-Ray chest P/A View and Torniquate Test. All patients were treated symptomatically. If needed fresh frozen plasma was given. Data was entered in excel sheet. Data was analysed using SPSS version 22.

RESULTS

In our study out of 70 subjects, 40 were male and 30 were female. Age of the patients in our study group ranges between 13 to 80 years. Mean age of the study was 46.5 years. Most of the patients diagnosed as a dengue fever presents with fever (approximately-100%), body ache (approximately-56%), chills(approximately-43%), generalized weakness (approximately-23%) and rarely some patient may present with rash, vomiting, melena, hematuria, itching, photophobia and neck stiffness. Fever

(approximately-24%) accompanied by facial flush and other flu like symptoms. The fever usually continue for two days to seven days and can be as high as 41 degree Celsius. Patients with fever accompanied with tachycardia (17%), some patients also had bradycardia (7%) may be due to myocarditis. bradycardia in dengue does not correlates with severity and stage of disease (Smith and Powell 1954) Few patient in our study was also had blanching (22.9%), hypotension (8.60%) and neck stiffness (1.4%). In our study 58% patients had thrombocytopenia which ranges from mild to severe, 38.5% patients had leukopenia, 19% patient had anemia which is mild, 6% patients had hyper billirubinemia, 37% patients had raised transaminases, 12% patients had deranged RFT's. In our study the laboratory findings suggest that the dengue fever patient present with thrombocytopenia most commonly and associated with leukopenia.

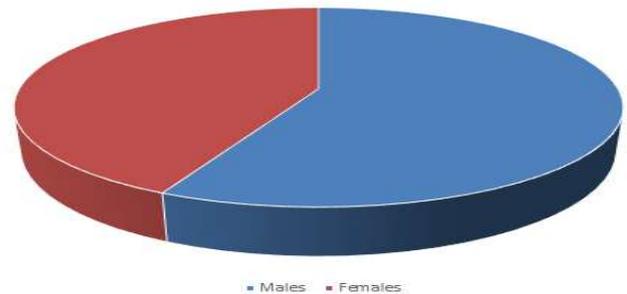


Figure 1: Distribution of dengue fever patients according to sex

Table 1: Distribution of dengue patients according to symptoms and signs

Symptoms and Signs	Number of patients	Percentage (%)
Fever	70	100.0
Body ache	56	80.0
Chills	51	72.9
Headache	43	61.4
Generalized weakness	23	32.9
Fever	24	34.3
Tachycardia	17	24.3
Blanching	16	22.9
Vomiting	7	10.0
Hypotension	6	8.6
Abdominal pain	4	5.7
Itching	3	4.3
Rash	4	5.8
Haematuria	1	1.4
Melena	1	1.4
Photophobia	1	1.4
Neck stiffness	1	1.4

Table 2: Distribution of dengue patients according to abnormal lab parameters

Abnormal Lab	Number of patients	Percentage (%)
HB	19	27.1
TLC	70	100.0
Platelet	58	82.9
Hematocrit	48	68.6
Sr Bilirubin	5	7.1
Direct Bilirubin	3	4.3
SGOT	31	44.3
SGPT	23	32.9
ALP	22	31.4
Sr.Creatinine	12	17.1

DISCUSSION

In our study out of 70 subjects, 40 were male and 30 were female. Male to female ratio was 1.33:1. Mean age of the study was 46.5 years. Similar findings were reported in Gupta *et al.* and Dar es Salaam 2014 outbreak.^{7,8} Males were affected more than females, this may be due to males are more exposed to mosquitoes in outdoor activity. Similar to our study, male preponderance was found in previous studies conducted by Karolie *et al.*⁹ Seema Avasthi *et al.*¹⁰; G Lepakshi *et al.*¹¹, Malavige *et al.*¹². Most of the patients diagnosed as dengue fever presents with fever (approximately-100%), Similar findings were observed in most of the studies from India.¹³⁻¹⁶ Fever (approximately-24%) accompanied by facial flush and other flu like symptoms. The fever usually continues for two days to seven days and can be as high as 41 degree Celsius. Patients with fever accompanied with tachycardia (17%), some patients also had bradycardia (7%). In our study, body ache was observed in approximately-56%. Other observed symptoms were chills (approximately-43%) and generalized weakness (approximately-23%). In our study 58% patients had thrombocytopenia which ranges from mild to severe Platelet Count <50000/cmm noticed in similar findings were noticed in Rajesh Deshwal *et al.*¹⁷ and Rachel Daniel *et al.*¹⁸ in a study by Munde *et al.*¹⁹ thrombocytopenia was observed in 75% patients. Karolie *et al.*⁹ found it to be 89%. In our study, 38.5% patients had leukopenia, 19% patient had anemia which is mild, 6% patients had hyperbilirubinemia, 37% patients had raised transaminases, 12% patients had deranged RFT's. Previous studies also noticed leukopenia in dengue patients.^{20,21} Hyperbilirubinemia was observed in higher number of patients in previous studies.²²⁻²⁴

CONCLUSION

Thrombocytopenia associated with leukopenia are most commonly observed laboratory findings in dengue fever.

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