

Clinical and Laboratory Findings of Dengue Virus Infections: An Observational Study in Rural Area of Western Uttar Pradesh

Ajay Kumar^{1*}, V. K. Singh²

^{1*}Associate Professor, ²Professor & Head,
Department of General Medicine, Teerthanker Mahaveer Medical College, Moradabad, Uttar Pradesh, India.

ABSTRACT

Introduction: Dengue fever (DF) has been identified as an emerging infectious disease in Uttar Pradesh Region. This study was designed to assess the clinical and biochemical parameters of dengue fever patients.

Materials and Methods: The medical records of all of the individuals who were admitted to the CRD from July 2016 to June 2017 were evaluated. The CRD Evaluation Protocol was used as a tool for data collection, which consists of a questionnaire on the epidemiological, clinical, and laboratory data that were collected during the first medical visit.

Results: Majority of the patients were males (69.8%). Females formed 36.1%. Maximum patients were in 21-40 age group (65.9%). Fever was universal followed by headache (96.8%), myalgia (98.0%), conjunctival injection (26.1%), morbilliform skin rash (38.8%), abdominal pain (27.6%), retro-orbital pain (26.1%), itching predominantly localized to palmar and plantar aspects of hands and feet (32.2%).

Conclusion: Early diagnosis, careful monitoring and proper fluid management goes a long way in reducing the mortality due to dengue hemorrhagic fever and shock syndrome.

Keywords: Dengue Fever, Biochemical Parameters, Epidemiological, Hemorrhagic Fever.

*Correspondence to:

Dr. Ajay Kumar,
Associate Professor, Department of General Medicine,
Teerthanker Mahaveer Medical College, Moradabad, UP.

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INTRODUCTION

Dengue fever (DF) has been identified as an emerging infectious disease in Uttar Pradesh Region. Dengue is caused by infection with one of the four dengue viruses: dengue virus 1 (DENV-1), DENV-2, DENV-3 and DENV-4.¹ Infection with any of these viruses may result in asymptomatic infection, dengue fever (DF), or the more severe forms, dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS). DHF and DSS were recognized in Southeast Asia soon after multiple serotypes began to circulate in the 1950s.^{2,3} Since then the burden of dengue has increased rapidly with the number of annual cases worldwide rising from 908 in the 1950s to 925,896 in the 2000s.⁴ The number of dengue-endemic countries has also expanded from nine to over 110.⁵ Cases of DHF and DSS have also been increasingly recognized in other regions including South Asia, Latin America and the Pacific,⁶⁻⁹ with pediatric cases being more common. In recent years, DF and DHF/DSS have become more common in adults.^{10,11}

Dengue is the most important arthropod-borne viral disease of public health significance, the global prevalence of which has grown dramatically in recent decades with estimated 2.5 billion people at a risk of acquiring dengue viral infection and more than 50 million new infections being projected annually.^{12,13} Dengue and its severe manifestations: DHF and dengue shock syndrome

(DSS), are recognized as important emerging public health problems in tropics and subtropics. An early clinical diagnosis of dengue hemorrhagic fever is difficult because the criteria that were established by the World Health Organization (WHO) may be present only in the initial phase of the acute form of the disease.¹⁴ Thus, laboratory tests combined with a guided clinical examination, especially in endemic areas, are crucial to confirm a diagnosis, identify, and prevent outbreaks and provide early treatment for the severe forms of the disease and complications.¹⁵ Classic dengue fever is marked by rapid onset of high fever, headache, retro-orbital pain, diffuse body pain (both muscle and bone), weakness, vomiting, sore throat, altered taste sensation, and a centrifugal maculopapular rash, among other manifestations. A small percentage of persons who have previously been infected by one dengue serotype develop bleeding and endothelial leak upon infection with another dengue serotype. This syndrome is termed dengue hemorrhagic fever (DHF). The exact clinical and laboratory profile is crucial for diagnosis as well as successful management of the patients. The elucidation of the exact clinical

The present study is an attempt to describe the salient clinical as well as laboratory findings of serologically confirmed hospitalized cases of dengue fever.

MATERIALS AND METHODS

This study was approved by hospital ethics committee of Teerthanker Mahaveer University. The medical records of all of the individuals who were admitted to the CRD from July 2016 to June 2017 were evaluated. The CRD Evaluation Protocol was used as a tool for data collection, which consists of a questionnaire on the epidemiological, clinical, and laboratory data that were collected during the first medical visit. Individuals with a dengue diagnosis that was based on clinical and serological criteria were included in the study. 410 Patients with confirmed dengue fever, admitted in a hospital were selected. Only IgM dengue antibody-positive cases were included. These patients were admitted with fever, retrobulbar pain, abdominal pain, myalgia, headache or bleeding manifestations. IgM dengue antibody was estimated using PANBIO dengue IgM capture ELISA. The diagnosis of dengue fever, dengue haemorrhagic fever and dengue shock syndrome was based on the WHO criteria.¹⁶ The patients with concomitant malaria, typhoid, leptospirosis etc were excluded from the study. Detailed history and careful clinical examination was performed on each patient. Laboratory investigations done were Hb, TLC/DLC, platelet count, hematocrit, liver function tests, blood urea and serum creatinine, chest radiograph and ultrasound scan of abdomen. Blood count's was monitored periodically as and when required till resolution.

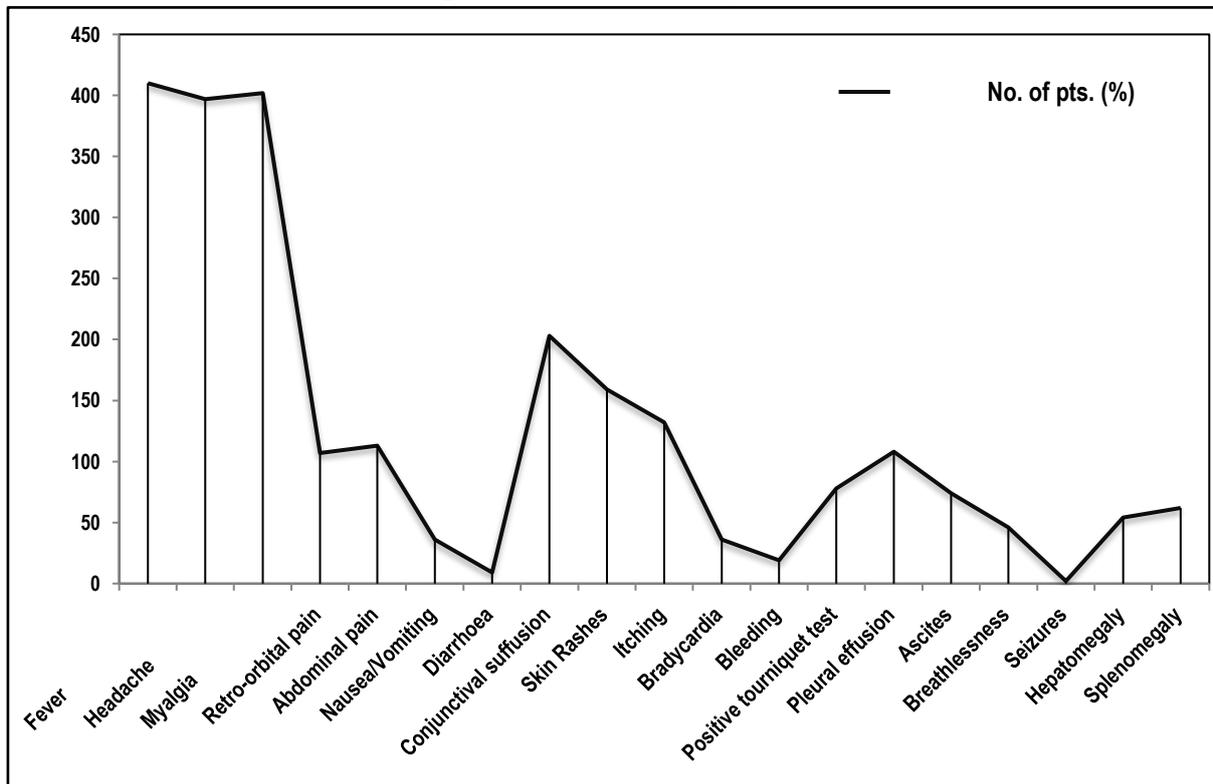
Table 2: Clinical features and laboratory findings of patients

CLINICAL FEATURES	No. of pts. (%)
Fever	410 (100)
Headache	397 (96.8)
Myalgia	402(98.0)
Retro-orbital pain	107 (26.1)
Abdominal pain	113 (27.6)
Nausea/Vomiting	36 (8.8)
Diarrhoea	9 (2.2)
Conjunctival suffusion	203 (49.5)
Skin Rashes	159 (38.8)
Itching	132 (32.2)
Bradycardia	36 (8.8)
Bleeding	19 (4.6)
Positive tourniquet test	78 (19.02)
Pleural effusion	108 (26.3)
Ascites	74 (18.04)
Breathlessness	46 (11.2)
Seizures	02 (0.9)
Hepatomegaly	54 (13.1)
Splenomegaly	62 (15.1)
LABORATORY FINDINGS	
Thrombocytopenia (<50,000/cumm)	286 (69.8)
Leucopenia (<4,000/cumm)	97 (23.7)
Raised AST, ALT >45 IU/L	374 (91.2)
Raised hematocrit (>45%)	72 (17.6)

Table 1: Sex and age characteristics of patients

Age (Years)	Male	Female
16-20	41	22
21-40	187	83
41-60	46	37
>60	12	6
Total	286 (69.8%)	148 (36.1%)

Figure 1: Clinical features of patients



RESULTS

Majority of the patients were males (69.8%). Females formed 36.1%. Maximum patients were in 21-40 age group (65.9%) (Table 1). Fever was universal followed by headache (96.8%), myalgia (98.0%), conjunctival injection (26.1%), morbilliform skin rash (38.8%), abdominal pain (27.6%), retro-orbital pain (26.1%), itching predominantly localized to palmar and plantar aspects of hands and feet (32.2%). Positive tourniquet test was found in 19.2% of patients, while bleeding in form of petechiae, ecchymosis and epistaxis was documented in 5.9% of cases. Pleural and ascitic fluid exudation was documented in 26.3% and 18.04% of cases, respectively. Hepatomegaly was noted in 13.1% and splenomegaly in 15.1% of all cases (Table 2, Figure 1).

DISCUSSION

In our findings Majority of the patients were males (69.8%). Females formed 36.1%. Maximum patients were in 21-40 age group (65.9%). Fever was universal followed by headache (96.8%), myalgia (98.0%), conjunctival injection (26.1%), morbilliform skin rash (38.8%), abdominal pain (27.6%), retro-orbital pain (26.1%), Itching predominantly localized to palmar and plantar aspects of hands and feet (32.2%). Positive tourniquet test was found in 19.2% of patients, while bleeding in form of petechiae, ecchymosis and epistaxis was documented in 5.9% of cases. Pleural and ascitic fluid exudation was documented in 26.3% and 18.04% of cases, respectively. Hepatomegaly was noted in 13.1% and splenomegaly in 15.1% of all cases. Slightly higher number of males is primarily because of the serving soldiers most of whom tend to stay alone leaving their families at their paternal homes. Fever was the most common presentation (100%), which is in unison with other similar studies from India and South East Asia.¹⁷⁻²⁰ Headache and myalgia were seen in majority of cases. Retro-orbital pain was noticed in only in 18.25% of cases. Conjunctival injection was documented in 39.41% of all cases and diffuse erythematous skin rash in 37.86%. Mandal et al in a similar study have documented headache in 62.16% and rash in 37.84% of cases.²¹ The laboratory alterations such as thrombocytopenia and elevation of ALT were more severe in adults, like published before.²² It is noteworthy that we also did not find respiratory and renal involvement in any of the cases studied. Several studies have suggested that adults who have been previously primed with DENV have a favorable prognosis; however, subsequent infections by distinct DENV serotypes may result in severe forms of the disease. Primary infection could be a protective factor against the severe forms of dengue in children, which may explain the higher incidence of the severe forms of the disease and hospitalization in adults.²²

Dengue control and prevention require awareness of factors beyond those commonly seen in tropical countries. Many of the affected countries are poor and developing. Realistic approaches for their infrastructure are required to be urgently developed. Detailed serological and virological studies of dengue outbreaks in endemic areas are required to pinpoint the nature of the outbreaks to help to develop effective control measures.

CONCLUSION

Early diagnosis, careful monitoring and proper fluid management goes a long way in reducing the mortality due to dengue hemorrhagic fever and shock syndrome. Fever associated with

headache, retroorbital pain, erythematous morbilliform rash, conjunctival suffusion and itching in palms and soles along with thrombocytopenia, leucopenia, elevated liver transaminases should prompt a clinician on the possibility of dengue infection. Platelet transfusions have little role in management of dengue patients.

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