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Original Research Article

Assessment of clinical and haematological profile in dengue fever

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ABSTRACT

Introduction: Series of biochemical and haematological changes occur during the course of the illness. Physicians should be aware of the most common clinical as well as clinical and biochemical presentations which are important for the clinical management of patients and thus crucial for saving a life. Therefore, this study aimed to highlight the most common clinical features and biochemical findings of dengue cases.
Methods: A total of 200 cases of suspected dengue fever were included in the study. The present is the prospective cohort study; samples were selected with sampling technique. A total of 200 cases of suspected dengue fever were included in the study. The frequency of various signs and symptoms and the values of laboratory tests were compared. The results were tabulated and correlated.
Results: In our series in clinical manifestations, all cases presented with fever, myalgia was found in 156 patients, headache was found in 106 patients, rashes were present in 28 patients, others clinical features are nausea, pain abdomen was seen in 42 patients, loose motion was seen in 34 patients etc. None of our patient have visual complains. Retro-orbital pain was noted in 12 patients. Bleeding manifestations in any form was seen in 78 cases.
Conclusions: Dengue needs to be suspected in any patient presenting with a short duration of fever and myalgia. Bleeding tendencies should be closely watched for. When features of plasma leakage such as pedal edema, pleural effusion, ascites, are present, patient should be closely watched for and should be immediately managed.

Keywords: Bleeding manifestation, Dengue, Epistaxis, Fever, Shock

INTRODUCTION

Dengue is a mosquito-borne arboviral disease and is a major global public health threat that is prevalent in tropical and sub-tropical regions of the world, mostly in urban and semi-urban areas. The global incidence of dengue infection has grown dramatically over the years leading to significant morbidity and mortality in the tropical countries.[1,2]

Dengue fever (DF) with its severe manifestations such as Dengue hemorrhagic fever (DHF) and Dengue sock syndrome (DSS) has emerged as a major public health problem of international concern. Dengue fever is caused by an ribonucleic acid (RNA) virus of the family Flaviviridae; genus Flavivirus.[3] It has 4 closely related serotypes DEN 1, DEN 2, DEN 3, DEN 4 which bear partial cross reactivity with each other. The geographical distribution has greatly expanded over the last 30 years, because of increased potential for breeding of *Aedes aegypti*.[4] This has been prompted by demographic explosion, rapid growth of urban centers with strain on public services, such as potable water and augmented by rain water harvesting in diverse types of containers resulting in multiple storage practices.[5]

In clinical practice, as it is known, the patient's diagnosis and management are based on clinical manifestations and abnormal laboratory findings. Initial Dengue virus (DENV) infection may be asymptomatic or may result in

a nonspecific febrile illness typically present with the sudden onset of fever, severe headache, bone, joint and muscular pains, mild bleeding manifestation, weakness, myalgia, and rash. All these clinical presentations are similar to many other febrile diseases prevalent in the country; such as malaria, kala-azar and typhoid fever which pose a diagnostic challenge of dengue.[1,6]

DF with its severe manifestations such as DHF and DSS has emerged as a major public health problem of international concern. The geographical distribution has greatly expanded over the last 30 years, because of increased potential for breeding of *Aedes aegypti*.[7] This has been prompted by demographic explosion, rapid growth of urban centers with strain on public services, such as potable water and augmented by rain water harvesting in diverse types of containers resulting in multiple storage practices.[8]

Series of biochemical and clinical changes occur during the course of the illness. They could be used to identify the complications early and introduce effective management strategies thus reducing morbidity and mortality.[9] Physicians should be aware of the most common clinical as well as clinical and biochemical presentations which are important for the clinical management of patients and thus crucial for saving a life. Therefore, this study aimed to highlight the most common clinical features and biochemical findings of dengue cases.

METHODS

The present study was done in the medical college and the associated outpatient department of the hospital. The study was done for the period of one year. The patients were informed about the study and the written informed consent was obtained from them. The college institutional ethical committee was informed about the study and the ethical clearance certificate was obtained from them before the start of the study.

A total of 200 cases of suspected dengue fever were included in the study. The present is the prospective cohort study; samples were selected with sampling technique. Admitted to the hospital with the history of fever of more than 38.5^0C and Immunoglobulin M (IgM) dengue positive were selected using purposive sampling techniques. They are followed from the onset of fever to time of recovery or discharge according to World Health Organization (WHO) discharge criteria whichever is earlier. The following investigations were done- blood counts, IgM dengue. Clinically patients are monitored and platelets, hematocrit test are repeated daily.

Inclusion criteria were as follows: patients admitted to the medical hospital, patients having fever more than 38.5^0C, lab diagnosis with IgM dengue positive test. The exclusion criteria were: age less than 15 years or more than 60, presence of any systemic diseases and present of any haematological disorder.

Serum samples were obtained on an average of 5 to 7 days after DF symptoms had appeared. The cases were followed-up daily for the clinical and laboratory parameters. The patients were treated with intravenous (IV) fluids, paracetamol, antacids, blood products and inotropics as per WHO criteria for treatment of dengue. These cases were stratified based on the presence or absence of complications like shock and haemorrhage into various dengue types. The frequency of various signs and symptoms and the values of laboratory tests were compared. The results were tabulated and correlated. The outcome was recorded in every subject. The criteria defined by WHO as mentioned previously, were followed for the inclusion of subjects into the study.

Statistical analysis

The following methods of statistical analysis have been used in this study. The excel and Statistical package for social sciences (SPSS) (SPSS Inc, Chicago) software packages were used for data entry and analysis. The results were presented in numbers and percentage for categorical data in table.

RESULTS

The present study was done with the aim to highlight the most common clinical features and biochemical findings of dengue cases. A total of 200 patients were included in the study. There were 132 male patients and 68 female patients. The age wise distributions of the patients were as follow (Table 1). The maximum number of patients was in the age range of 21-30 years. The mean age was found to be 26 years. Out of 200 cases with distribution in antigenic presentation, 112 patients were NS1 positive, IgM positive in 58 patients of cases, NS1 and IgM positive in 18 patients, IgM and IgG positive in 8 patients of case which indicated secondary cases and 4 cases with all NS1, IgM, IgG for dengue positive (Table 2).

Table 1: Age wise distribution of the patients.

Age distribution (in years)	Number of patients
15-20	34
21-30	96
31-40	34
41-50	26
51-60	10
Total	200

In our series in clinical manifestations, all cases presented with fever, myalgia was found in 156 patients, headache was found in 106 patients, rashes were present in 28 patients, others clinical features are nausea, pain abdomen was seen in 42 patients, loose motion was seen in 34 patients etc. None of our patient have visual complains. Retro-orbital pain was noted in 12 patients. Bleeding manifestations in any form was seen in 78 cases (Table 3).

Table 2: Antigenic/antibody presentations of dengue cases.

Antigenic/antibody presentations	Number of patients
NSI antigen	112
IgM antigen	58
NSI antigen + IgM antibody	18
IgM antibody + IgG antibody	8
NS1 Antigen + IgM Antibody + IgG antibody	4
Total	200

Table 3: Clinical manifestation of the patients.

Symptoms seen in patients	Number of patients
Myalgia and backache	156
Rashes	28
Retro orbital pain	12
Headache	106
Loose motion	34
Fever	200
Bleeding manifestation	78

Table 4: Spectrum of bleeding manifestations.

Spectrum of bleeding manifestation	Number of patients
Malena	36
Epistaxis	12
Hematuria	2
Petechie	46
Hematemesis	4
Gum bleeding	4
Ophthalmic bleed	16

In spectrum of bleeding manifestations; bleeding in skin manifestations like purpura or petechie predominated in 48 patients. Gastrointestinal bleeding like malena was seen in 36 patients and hematemesis was found in 4 patients and other bleeding features like epistasis was found in 12 cases,gum bleeding in seen in 4 cases, haematuria was seen in 2 cases, and ophthalmic bleeding like sub conjunctival haemorrhage, intravitreal haemorrhage was seen in 16 cases (Table 4).

DISCUSSION

DF is the most important arboviral infection of humans and has become a major global public health problem. It is one of the most important tropical infectious diseases in the world. In India, epidemics are becoming more frequent. Involvement of younger age group and increasing in the frequency of epidemics are indicators of higher incidence of infection.[10]

Classical dengue fever is an acute febrile illness but in a small percentage of dengue infection, a more severe form of disease known as DHF occurs. Early recognition and meticulous management are very important to save precious lives from this killer disease. The incidence and geographical distribution of dengue have increased due to increase in global temperature and increased population, unplanned urbanization, inefficient mosquito control, and lack of health care facilities.[11]

Dengue has diverse of clinical manifestations starting from simple fever to life threatening complications and severe encephalopathy too. In our series all patient presented with fever, followed by myalgia seen in 156 case. Headache is also one of common presentation but retro-orbital pain which is a classical feature of dengue was seen only in 12 cases which is much less than other studies but similar to Kapoor et al.[12] Our clinical findings were similar to that of other previous studies. These were GI manifestations like loose stools and abdominal pain. Rash, mostly of maculo-papular variety, rarely pruritic, seen in extremities and trunk was found in 28 cases. Gupta et al, reported a similar results with 100% presenting with fever, but a higher incidence of rash seen in 72 cases and retro-orbital pain was seen in 80 cases.[13] Kumar on the other hand reported 98% presentation with fever, a similar incidence of rash (19.1%) but a lower incidence of headache (31%).

There were 120 cases who presented with any form of bleeding manifestations. Purpura and petechiae, common manifestations of dengue was found 46 cases. However, melena was found in 36 cases. Bleeding from other sites like epistasis 12 cases, gum bleeding was seen in 4 patients, ophthalmic bleeding like sub conjunctival haemorrhage was observed only in a few cases. Sreenivas et al, found that 26% of cases had melaena, 20% had petechiae, 8% had haematemesis, 4% had epistaxis and 2% had gum bleeding.[14] Haematuria was the least common finding among our patients, accounting for about 1%, it was reported the same in the earlier studies of Sreenivasan et al, Narayanan et al, that bleeding by the urogenital tract is less common among the bleeding manifestations.

The pathophysiology of dengue infections is complex and not completely understood. Various manifestations of dengue is due to direct virus invasion or complex immune mechanism comprise of complement system pathway and NK cells. Complements activation due to immune activation and cytokine production are involved in mechanism of plasma leakage.[15]

CONCLUSION

There is increase in incidence of the dengue fever leads to increase in the necessity to understand the dengue fever. Dengue needs to be suspected in any patient presenting with a short duration of fever and myalgia. Bleeding tendencies should be closely watched for. When features of plasma leakage such as pedal edema, pleural effusion,

ascites, are present, patient should be closely watched for and should be immediately managed.

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