Clinical Profile of Dengue Fever Infection in Patients seen in OPD & Admitted in Govt Medical College, Doda (J &K) India for the Year 2022

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ABSTRACT

Introduction: Dengue infections can result in a wide spectrum of disease severity ranging from an influenza-like illness (dengue fever; DF) to the life-threatening dengue hemorrhagic fever (DHF)/dengue shock syndrome (DSS). The study was aimed to compare the clinical profile of all patients diagnosed with dengue viral infection at GMC Doda.

Material and methods: This retrospective study included 215 patients infected with dengue virus, age 20 years to 81years. Laboratory and haematological data were included.

Results: Peak of infection occurred in Nov. 2022 and least number of cases were recorded in September 2022. Common clinical symptoms were fever, headache and myalgia. Common haematological abnormalities were thrombocytopenia and leucopoenia. All patients survived. There was no case of dengue hemorrhagic fever or dengue shock syndrome.

Conclusions: Significant differences in the clinical profile is possibly because of infection with different serotypes of dengue virus (DENV), concurrent/sequential infection of more than one serotype, and differences in host immune responses associated with host genetic variations.

Keywords: Dengue Fever, Leucopoenia, Thrombocytopenia

INTRODUCTION

This study was conducted in GMC Doda from September to December 2022 (dengue season) Doda is a district in the eastern part of jammu division in the Indian union territory of Jammu & Kashmir and consists of 18 district and covers an area of 2,625Km^2. It is also called Chenab valley. Population of doda is 569,812. It will be pertinent to mention that Dengue has not be reported till date and this is first time Dengue fever cases were recorded.

Dengue (Den gay, Dandy) is a mosquito-borne viral illness caused by one of the four serotypes of the dengue virus DENV; (DENV-1 to DENV-4) belonging to the family Flaviviridae. The virus serotypes are closely related but antigenically distinct. Dengue infections can result in a wide spectrum of disease severity ranging from an influenza-like illness (dengue fever; DF) to the life- threatening dengue hemorrhagic fever (DHF)/dengue shock syndrome (DSS). In recent decades, the incidence of dengue infection has increased around the world and has become a major international public health concern. The disease is now endemic in more than 110 tropical and sub-tropical countries. The World Health Organization (WHO) estimates that there may be 50 million dengue infections worldwide every year[1,2] Infection with one serotype of DENV provides lifelong immunity to that serotype but results only in partial and transient protection against subsequent infection by the other three serotypes.

It is possible for a person to be infected as many as four times, once with each serotype. It is well documented that sequential infection with different DENV serotypes increases the risk of developing DHF. Ninety percent of DHF infections occur in children less than 15 years of age. There is currently no specific treatment for DENV infection, although several potential vaccines are in development; therefore, the only method of preventing DENV transmission is vector (mosquito) control.[1,3]

Early clinical features of dengue infection are variable among patients, and initial symptoms are often nonspecific; therefore, specific laboratory tests are necessary for an accurate diagnosis.[7,8] According to the US Centers for Disease Control and Prevention (CDC) and the WHO dengue guidelines, the clinical features of DF and DHF are sudden onset of fever, severe headache, myalgias and arthralgias, leucopenia, thrombocytopenia, and hemorrhagic manifestations.[8]

It occasionally produces shock and haemorrhage, leading to death. Classic DF symptoms include fever, headache, retro-orbital pain, myalgias and arthralgias nausea, vomiting, and often a rash. Some DF patients develop the more serious form of the disease DHF with symptoms that include a decline in fever and presentation of hemorrhagic manifestations, such as microscopic hematuria, bleeding gums, epistaxis, hematemesis, malena, and ecchymosis. DHF patients develop thrombocytopenia and hemoconcentration; the latter is due to an increase in the concentration of blood cells resulting from the leakage of plasma from the bloodstream. These patients may progress into DSS, which can lead to profound shock and death if not treated. Advance clinical symptoms of DSS include severe abdominal pain, protracted vomiting, and a notable change in temperature from fever

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to hypothermia.[2] In this study, we analyzed the variation in clinical features of DENV-infected patients admitted in GMC Doda and Hospital Doda and majority of them were seen in OPD and managed on OPD basis.

MATERIAL AND METHODS

Patients diagnosed with dengue viral infection (n= 215, 67 females and 148 males), aged 20 years to 81 years old, admitted at GMC Doda from September, 2022 to December, 2022 were included in the study. All the patients were from the neighboring catchment area. All patients were admitted and discharged within a period of 3-7 days. All patients received IV fluids and were closely monitored during admission. No patients required platelet transfusion. All patients survived. No patient went into dengue hemorrhagic fever or dengue shock syndrome.

Laboratory profile

All patients were tested for NS1 ELISA and were positive.

Haematological profile

Haematological parameters evaluated were platelet count, prothrombin time (PT), partial thromboplastin time (PTT), Hb and haematocrit (HCT) levels, complete blood count (CBC), and white blood cell count (WBC). Blood glucose, urea/creatinine and LFT, X ray chest, ECG were done for all patients as baseline investigations Among the studied patients, none had diabetes and only 3 patients were hypertensive. USG examination showed acalcular cholecystitis in 1, generalised lymphadenopathy in 1 patient.

RESULTS

Seasonal distribution

The first case of DENV infection detected in September 2022. Total number of cases admitted in September were 2, 19 in October, 8 in November and 3 in December. The peak was seen in October as shown in Fig 1.

Haematological profile

Thrombocytopenia (<1,50,000 platelet count) was observed in all patients. The lowest count was recorded as 5000 and highest was 1.4 lacs. One patient had bleeding gums with platelet count of 5000. This female patient was observed but no platelet transfusion was given and the patient recovered in a couple of days.

Clinical features	Number of patients	%age
Fever	32	100
Rash, flushed	16	50
Retro-orbital pain	8	25
Headache	11	34
Back pain/joint pain	1	3
Acalcular cholecystitis	1	3
Abdominal pain	3	3
Pleural effusion	1	3
Bleeding gum	1	3
Generalized lymphadenopathy	1	3
Dengue triad(fever, headache, rash)	7	21

Table-1: Clinical and laboratory profile of dengue patients admitted at GMC Doda.

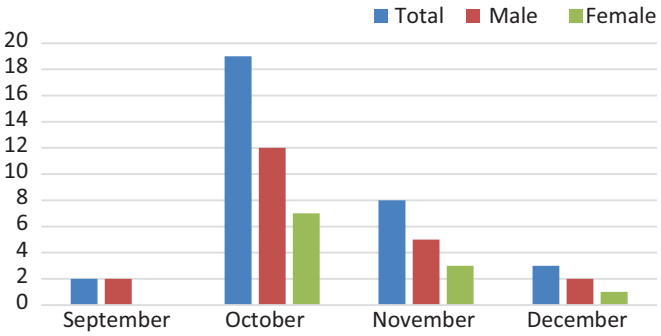

Figure-1: Distribution of patients attending hospital in 4 months with male female ratio.

DISCUSSION

Seasonal distribution

Dengue fever usually commences from mid-June and then there is a surge in September to December. But this time cases were seen from September to December and no cases were seen in June, July and August. Probably this is due to increased temperature (global warming). The pathogenesis of DENV is poorly understood.

A complex interaction between immuno-pathologic, viral, and human genetic factors results in a varied DENV disease outcome, which may explain the varied range of clinical presentations observed in this retrospective analysis. A possible reason for the significant differences seen in the clinical expression of the disease may be due to infection with different DENV serotypes and the possibility of concurrent infections with more than one serotype. Co-circulation of multiple DENV serotypes has been reported from many parts of the world, including India during an outbreak of DHF/DSS in 2006. Co- circulation of multiple DENV serotypes would result in an increased risk of concurrent infections[11,12] There is, however, limited documentation describing concurrent infections with more than one serotype in the same individual.[13,14] Furthermore, as already alluded to, sequential infection with more than one serotype is thought to be a major factor for the emergence of DHF.[15]

Both primary and secondary infection by any of the four DENV serotypes can cause DF and DHF; however, virus virulence is not the only factor to explain differences in host susceptibility to the disease and disease severity. Host immune response variations have been associated with polymorphism in the human genome, which may help explain why some patients develop end-stage complications in dengue disease and others only experience a mild form of the disease.[17]

In another study of children with DENV infection, host genetic differences were shown to affect the immune response and consequently, influence disease outcome.[18] Dengue infection can have potentially fatal consequences, and to date, vector control methods to prevent the spread of the virus have been unsuccessful.[19] Although there are promising vaccine candidates in development, further studies are required for a greater understanding of the

humoral immune responses to DENV infection and disease pathogenesis.[20,21]

CONCLUSION

It was observed that significant differences in the clinical presentation of DENV infection. Dengue viral infection is a complicated disease and many factors may be attributed to the differences seen, such as infection with different serotypes or infection with more than one serotype, either sequentially or concurrently. Differences in host genetics and immune responses may also play a role in the severity of infection..This is first time in Doda district,dengue cases were reported. This time a total of 215 cases of dengue were reported and all of them were NS1 positive.out of 215 cases, only 32 patients got admitted and rest were managed on OPD basis. We could not explain,the reasons for dengue infection,as no case was reported till time.probably,GMC doda was created in the year 2019 and this district hospital was not well equipped with man and machinery. It is coming as teaching and research centre and probably,we think on boarder terms and conditions. Only 5 patients had travel history to Jammu,where dengue is reported from decades. We have to remain vigilant and genome sequencing may be taken up in future for research and academic purposes.

Ethical approval

The study was approved by the Institutional Ethics Committee

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