International Journal of Research in Medical Sciences
Shah MY et al. Int J Res Med Sci. 2020 Aug;8(8):3027-3030
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012

DOI: http://dx.doi.org/10.18203/2320-6012.ijrms20203458

Original Research Article

Clinical profile of dengue fever infection in patients admitted in NC Medical College, Haryana in the year 2019

Mohd Y. Shah[1], Faisal Y. Shah[2], Ifrah S. Kitab[3], Faizan Y. Shah[4]*

[1]Department of Medicine, NC Medical College, Israna, Haryana, India
[2]Department of Orthopedics, Ealing hospital, United Kingdom
[3]Department of Ophthalmology, Government Medical College, Srinagar, Jammu and Kashmir, India
[4]Department of Dermatology, Government Medical College, Srinagar, Jammu and Kashmir, India

Received: 16 June 2020
Accepted: 06 July 2020

***Correspondence:**
Dr. Faizan Y. Shah,
E-mail: faizanyounis@gmail.com

ABSTRACT

Background: 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 NCMC.
Methods: This retrospective study included 24 patients infected with dengue virus, aged 19 years to 45 years. Laboratory and haematological data were included.
Results Peak of infection occurred in November 2019 and no cases were recorded in October 2019. Common clinical symptoms were fever, joint pains, headache and rash. Common haematological abnormalities were thrombocytopenia. 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, Dengue hemorrhagic fever, Thrombocytopenia

INTRODUCTION

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.[4,5] 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, leucopoenia, thrombocytopenia, and hemorrhagic manifestations.[5] 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 to hypothermia.[2] In this study, authors analyzed the variation in clinical features of DENV-infected patients admitted in NCMC Hospital Panipat, Haryana, India.

METHODS

September 2019 to December 2019. All the patients presenting with a history of fever were subjected to evalutation and those who tested positive for dengue based on ELISA were included in the study.

All the patients were from the neighbouring catchment area. All patients were admitted and discharged within a period of 3-7 days. Bed rest and symptomatic treatment was given. IV fluids or platelet transfusion was not given in any patient. 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.

Inclusion criteria

All patients presenting with fever who were diagnosed as suffering from dengue based on ELISA were included in the study after obtaining an informed consent.

Exclusion criteria

Fever of any other etiology and patients who didn't consent to be a part of the study was excluded.

RESULTS

Seasonal distribution

The first case of DENV infection was detected in September 2019. Total number of cases seen during this period was 24. The age of the patients ranged from 19 to 45 years with a mean age of 28 years. Number of cases enrolled in September was 4, zero in October, 19 in November and one in December. The peak was seen in November. The total number of cases and gender wise distribution is shown in Figure 1. The clinical features of the patients are summarized in Table 1.

Table 1: Clinical and laboratory profile of dengue patients admitted at NCMC.

Clinical features	Number of patients	Percentage
Fever	24	100%
Rash, flushed	9	37.5%
Retro-orbital pain	2	8.3%
Headache	10	41.7%
Back pain/joint pain	21	87.5%
Abdominal pain	1	4.2%
Dengue triad (fever, headache, rash)	7	29.2%

Haematological profile

Thrombocytopenia (<l00,000 platelets/µl) was observed in 100% of patients. The lowest count was recorded as 8000 and highest was 4.9 lacs.

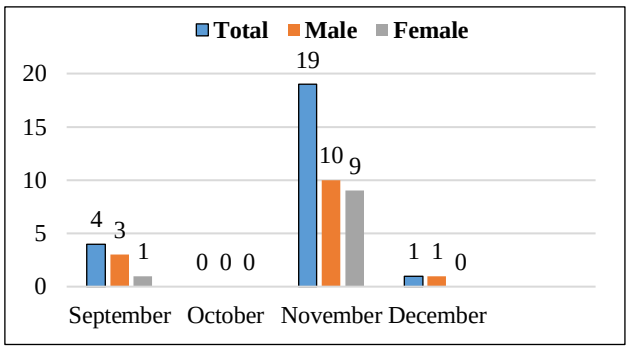

Figure 1: Distribution of patients attending hospital in 3 months with male female ratio.

The fall in platelet count was not significant in majority of the patients with most patients (75%) maintaining platelet counts above 50000.

DISCUSSION

Seasonal distribution

Dengue fever usually commences from mid-June and then there is a surge in September and November. But this time dengue patients were negligible in number across the country. This can possibly be attributed to the fact that people have become more vigilant and aware regarding this disease. Spraying of insecticides and caution regarding stagnation of water have also contributed to the decrease in number of cases witnessed compared to previous years.

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.[6,7]

There is, however, limited documentation describing concurrent infections with more than one serotype in the same individual.[8,9] Furthermore, as already alluded to, sequential infection with more than one serotype is thought to be a major factor for the emergence of DHF.[1] 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.[10]

In another study of children with DENV infection, host genetic differences were shown to affect the immune response and consequently, influence disease outcome.[11]

Dengue infection can have potentially fatal consequences, and to date, vector control methods to prevent the spread of the virus have been unsuccessful.[12] 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.[13]

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. The difference in clinical profile of Dengue Fever in our study from the study which we did in 2015 in MAMC Agroha Haryana was that all patients at the time of presentation were thrombocytopenicin this study. Only seven patients presented with classical triad of Fever, headache, rash. Maximum patients this time presented with fever and joint pains.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. WHO Fact sheet No 117: Dengue and dengue haemorrhagic fever. Available at: http://www.who.int/mediacentre/factsheets/fs117/e/. Accessed 23 June 2020.
2. Dengue and Dengue Hemorrhagic Fever: Information for Health Care Practitioners – CDC Division of Vector- Borne Infectious Diseases. Available at: http://www.cdc.gov/ncidod/dvbid/dengue/dengue-hcp.htm. Accessed 27 January 2016.
3. Malavige GN, Fernando S, Fernando DJ, Seneviratne SL. Dengue viral infections. Postgrad Med J. 2004;80:588-601.
4. Khan NA, Azhar EI, El-Fiky S, Madani HH, Abuljadial MA, Ashshi AM, et al. Clinical profile and outcome of hospitalized patients during first outbreak of dengue in Makkah, Saudi Arabia. Acta Trop. 2008;105:39-44.
5. Ramos MM, Tomashek KM, Arguello DF, Luxemburger C, Quiñones L, Lang J, et al. Early clinical features of dengue infection in Puerto Rico. Trans R Soc Trop Med Hyg. 2009;103(9):878-84.
6. Coffey LL, Mertens E, Brehin AC, Fernandez-Garcia MD, Amara A, Després P, et al. Human genetic determinants of dengue virus susceptibility. Microbes Inf. 2009;11:143-56.
7. Balmaseda A, Hammond SN, Pérez L, Tellez Y, Saborío SI, Mercado JC, et al. Serotype-specific differences in clinical manifestations of dengue. Am J Trop Med Hyg. 2006;74:449-56.
8. Bharaj P, Chahar HS, Pandey A, Diddi K, Dar L, Guleria R. Concurrent infections by all four dengue virus serotypes during an outbreak of dengue in 2006 in Delhi, India. Virol J. 2008;5:1.
9. Loroño-Pino MA, Cropp CB, Farfán JA, Vorndam AV, Rodríguez-Angulo EM, Rosado-Paredes EP, et

al. Common occurrence of concurrent infections by multiple dengue virus serotypes. Am J Trop Med Hyg. 1999;61:725-30.
10. Chaturvedi U, Nagar R, Shrivastava R. Dengue and dengue haemorrhagic fever: implications of host genetics. FEMS Immunol Med Microbiol. 2006;47:155-66.
11. Long HT, Hibberd ML, Hien TT, Dung NM, Van Ngoc T, et al. Patterns of gene transcript abundance in the blood of children with severe or uncomplicated dengue highlight differences in disease evolution and host response to dengue virus infection. J Infect Dis. 2009;199:537-46.
12. Swaminathan S, Khanna N. Dengue: recent advances in biology and current status of translational research. Curr Mol Med. 2009;9:152-73.
13. Crill WD, Hughes HR, Delorey MJ, Chang GJ. Humoral immune responses of dengue fever patients using epitope-specific serotype-2 virus-like particle antigens. PLoS ONE 2009;4(4):e4991.

Cite this article as: Shah MY, Shah FY, Kitab IS, Shah FY. Clinical profile of dengue fever infection in patients admitted in NC Medical College, Haryana in the year 2019. Int J Res Med Sci 2020;8:3027-30.