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Original Research Article

Clinical and epidemiological profile of patients admitted with dengue fever in a tertiary care hospital, Thrissur, Kerala, India

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ABSTRACT

Background: Dengue is a fast emerging mosquito borne pandemic prone viral disease affecting many parts of the world. The elucidation of the exact clinical profile is important for patient management and thus crucial for saving life. Dengue is widespread throughout the tropics, with risk factors influenced by local spatial variations of rainfall, temperature, relative humidity, degree of urbanization and quality of vector control.
Methods: A descriptive study was undertaken and data was collected by reviewing the records of patients admitted with dengue fever over a period from January 2019 to August 2019. Total 100 records of confirmed cases of dengue were included in the study. The information regarding demographic details, clinical symptoms and complications, and epidemiological details were collected from the records using a questionnaire.
Results: Out of 100 patients admitted with dengue, 61% were males and 54% of the total were admitted during June and July month. Most common symptoms reported were fever (99%), headache (91%), muscle & joint pain (71%). The bleeding manifestation was reported in 11% and the most common site of bleeding was gastrointestinal tract.
Conclusions: The present study concludes that dengue confirmed cases are seen more among males, and the incidence of disease is more in age groups of less than 30 years. Most of them were residing in the Northern part of Thrissur (56%) and the most common clinical symptoms were fever and headache.

Keywords: Clinical profile, Dengue fever, Symptoms, Epidemiological profile

INTRODUCTION

Dengue is a fast emerging pandemic prone viral disease in many parts of the world. It is a mosquito borne viral infection causing severe flu like illness and, sometimes cause a potentially lethal complication called severe dengue due to plasma leaking, fluid accumulation, respiratory distress, severe bleeding, or organ impairment. Dengue is caused by four related, but antigenically distinct dengue viruses (DENVs, serotypes 1–4)[1] and are spread through the bite of an infected *Aedes* species (Ae. aegypti or Ae. albopictus) mosquito.

Every year, about 3.9 billion people get infected with Dengue and around 96 million manifest Severe Dengue. The Americas, South-East Asia and Western Pacific regions are the most severely affected, with Asia representing about 70% of the global burden of disease.[2]

Dengue virus is the most geographically widespread Arboviruses and is a major public health threat in the tropics and subtropics. The number of dengue cases reported to WHO increased over eight folds over the last two decades, from 505,430 cases in 2000 to over 2.4 million in 2010, and to about 4.2 million in 2019.

Reported deaths between the year 2000 and 2015 increased from 960 to 4032.[2]

There is no specific treatment for dengue/severe dengue. Early detection of disease progression associated with severe dengue, and access to proper medical care lowers fatality rates of severe dengue to below 1%.[2] The very first report of the existence of dengue fevers in India was way back in 1946. In 1963-1964, an initial epidemic of Dengue fever was reported on the Eastern Coast of India.[3] It spread northwards to Delhi in 1967[4] and simultaneously southwards[5] and gradually spread to the whole country. In India, dengue is endemic in almost all states and is a leading cause of hospitalization.[6] The disease, which typically had an urban distribution a few decades earlier, is now reported from peri urban as well as rural areas.[7] The incidence of dengue in Kerala is 49.278 per million population.[8] Total dengue cases reported from Kerala in 2019 was 4090 with 32 deaths.

The World Health Organization classifies dengue into two major categories: Dengue (with or without warning signs) and severe dengue. Dengue should be suspected when a high fever (40°C/104°F) is accompanied by two of the following symptoms: severe headache, pain behind the eyes, muscle and joint pains, nausea, vomiting, swollen glands or rashes. A patient enters the critical phase normally about 3-7 days after the onset of the illness. During this period, when the fever is dropping (below 38°C/100°F), warning signs that can manifest include severe abdominal pain, persistent vomiting, rapid breathing, bleeding gums, fatigue, restlessness or blood in vomitus. The primary pathophysiologic abnormality seen in Dengue Haemorrhagic Fever(DHF) and Dengue Shock Syndrome(DSS) is an acute increase in vascular permeability that leads to leakage of plasma into the extravascular compartment, resulting in hemo-concentration and decreased blood pressure.[9] It is a potentially deadly complication due to plasma leakage, fluid accumulation, respiratory distress, severe bleeding, or organ impairment. The next 24 to 48 hours of the critical stage can be lethal; proper medical care is needed to avoid complications and risk of death. The elucidation of the exact clinical profile is important for patient management and thus crucial for saving life.

Dengue is widespread throughout the tropics, with risk factors influenced by local spatial variations of rainfall, temperature, relative humidity, degree of urbanization and quality of vector control services in urban areas. Hence, the present study would be an attempt to describe the epidemiological and clinical profile of patients admitted with dengue fever in a tertiary care hospital.

METHODS

A cross-sectional study was conducted among the IgM and IgG confirmed cases of dengue admitted in the department of medicine and department of pediatrics of our medical college from June 2019 to August 2019. The sample size was calculated using the formula $4PQ/d^2$ where P is the proportion of dengue fever cases showing abdominal pain as a symptom. The value of P is taken to be 62.4% which was obtained from a previous study done at Kollam, Kerala.[10] The calculated minimum sample size was 60. The data was collected by reviewing the records of patients and the information regarding demographic details, clinical symptoms and complications, and epidemiological details like month of admission, place of residence which was collected from these records using a questionnaire. The incomplete case sheet records were excluded from the study. The institutional ethical clearance was obtained prior to the study. The obtained data was coded and entered in Microsoft Excel. Appropriate statistical methods, such as mean, percentage, proportion were used for analysis.

RESULTS

In total, 100 completely filled records were obtained for the study. The mean age of the study population is 34.77±19.37 years with a minimum age of 1 year and maximum of 82 years. In this study population, 25% is less than 21 years and 24% is between 21 and 30 years. 12%, 16% and 15% of the population falls in the age groups 31-40, 41-50 and 51-60 years respectively. Only 8% of the population is above 60 years. The age distribution of the study population is given in (Figure 1).

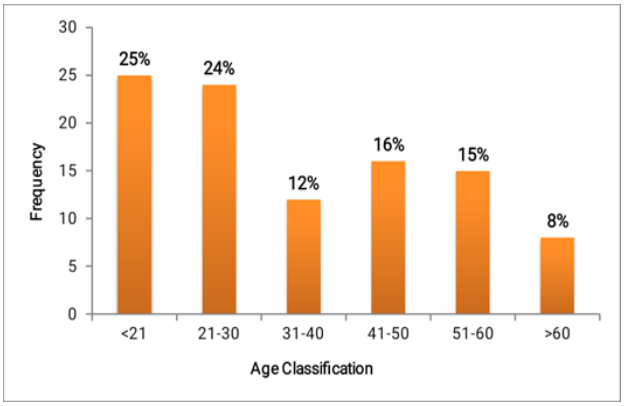

Figure 1: Age distribution of study population.

Out of the 100 patients considered for the study, 61% were males and 39% were females. Majority of the population were students (26%), followed by homemakers (19%), skilled workers (15%), farmers and businessmen (12%). The least number of cases were seen among professionals (7%). Considering the socio-economic status of the patients, 84% belong to the middle class category and 16% belong to the lower middle class category.

All the patients considered for the study were admitted during the months of June, July and August. 45% were admitted in June, 40% in July and only 15% in August. Since our Institution is located at Thrissur district, Kerala, India, the majority of the cases (57%) were reported from

the same place. 29% of the patients were from Palakkad district and 11% from Malappuram district. The remaining 3% were from districts Alleppey, Kannur and Kottayam combined. Out of the 57% of cases from Thrissur, 56% were from North of Thrissur and 44% were from South of Thrissur. The epidemiological profile of patients admitted with Dengue is given in (Table 1).

Table 1: Epidemiological profile of dengue.

Profile		Percentage
Gender	Male	61
	Female	39
Religion	Hindu	43
	Christian	24
	Muslim	33
Socioeconomic status	Middle class	84
	Lower middle class	16
Month of admission	June	45
	July	40
	August	15
Place of residence (among Thrissur natives)	Thrissur North	56
	Thrissur South	44

The most common symptoms presented by the patients were fever (99%) and headache (91%). 71% of them had body aches and 43% had vomiting. 26% of them presented with skin rashes and 20% had sore throats. Few of them had abdominal pain (11%) and diarrhoea (8%). Clinical profile of patients admitted with Dengue fever is given in (Figure 2). Few of the patients presented complications associated with dengue fever. 22% of them had hepatomegaly, 4% had pleural effusion, 11% showed bleeding manifestation and 1% had ascites. Complications associated with Dengue fever are given in (Figure 3). Among the bleeding patients, the most common site of bleeding was Gastrointestinal tract (64%), followed by gums (18%) and Respiratory tract(18%). The distribution of the site of bleeding is given in (Figure 4).

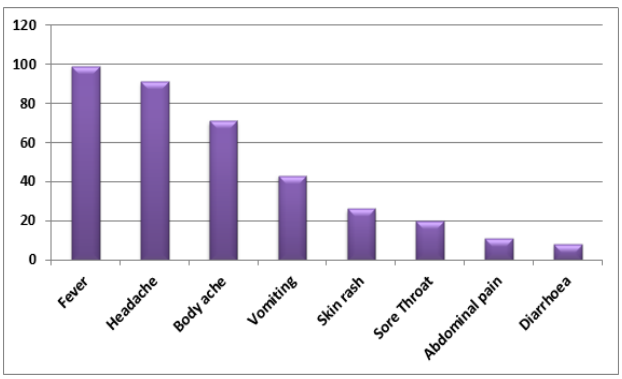

Figure 2: Clinical profile of dengue fever.

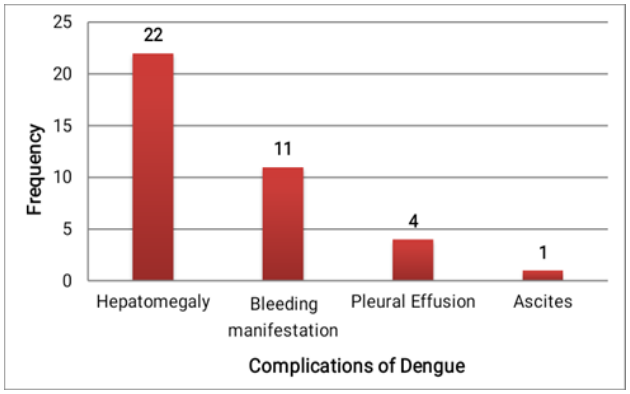

Figure 3: Complications of dengue.

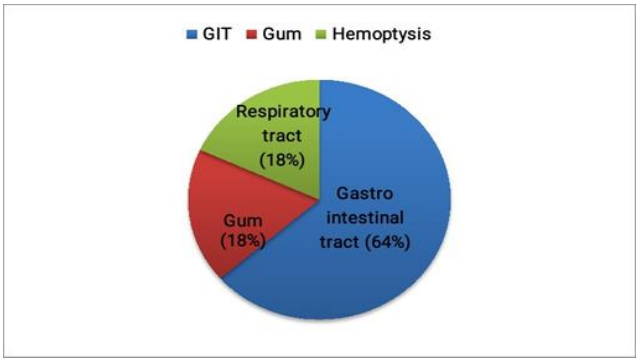

Figure 4: Site of bleeding.

DISCUSSION

This study describes the clinical and epidemiological profile of patients admitted with dengue fever in a tertiary care hospital, Thrissur, Kerala, India. In my study, the majority of the population was under 21 years and in the age group 21-30 years, who majorly belong to the Student category. The mean age of my study population is 34.77±19.37 years, which is different from a study conducted at Kollam, Kerala, where the mean age was 42.6 years, [10] and another study conducted at Delhi, where mean age was 26.3 years.[11] Since students are exposed to crowded classrooms, public parks, theatres, and other common public spaces, they probably have a higher risk of infection than other professionals and workers. Homemakers are the next most affected group. It could be because vectors that transmits dengue fever usually breeds in indoor settings, artificial water holding containers, plastic tanks, water storage jars, flower vases, glasses and plastic bottles.

According to my study, the majority of the patients were males (61%). In another study conducted at Delhi also, the majority of the patients were males(75.5%).[11] But in the study conducted at Kollam, the disease incidence was equally distributed among both sexes.[10] The high number of male patients could be because males often work outside the house and travel more compared to females, thus increasing the risk of mosquito bites and hence, the disease.

In my study, the majority of the cases were from Thrissur(57%) district of Kerala, India, out of which 56% were from North Thrissur and 44% from South Thrissur. The high numbers from Thrissur could be due to the location of the study setting in Thrissur. Thrissur is followed by Palakkad(29%) and Malappuram(11%) in the number of cases. This probably could be due to proximity of these districts to the study setting. Thrissur is bordered by Palakkad and Malappuram districts.

In my study, the majority of patients come from the middle class(84%) socioeconomic category. They probably had enough knowledge about the disease, but may not have taken any steps to prevent the disease.

Most of the patients considered for this study were admitted in June(45%) and July(40%) month. A review by Khormi et al.[12] has stated that climatic factors including rainfall, humidity and temperature are closely linked with mosquito density population. The rainfall provides places for the mosquitoes to lay eggs and develop to the adult stage. The mosquito population increases from the start of the rainy season.[13] Since the rainy season starts in June in Kerala, majority cases were reported during months of June and July. In another study conducted at Mumbai, they found that every year, most of the cases occurred between the months of June and November.[14]

In my study, in terms of clinical symptoms, most common symptoms presented were fever(99%) and headache(91%). This coincides with a study conducted at Kollam, where fever was documented in 242(96.8%) patients and headache among 193 patients(77.2%)[10]. But in another study at Mumbai, only 13.9% had a headache.[14]

In my study, 71% of them had body aches, but in the study conducted at Delhi, only 45 patients(45.9%) were presented with body aches[11] and in another study conducted at Mumbai, only 25.0% had body ache.[14] In my study, 20% had sore throats, few of them had abdominal pain(11%) and diarrhoea(8%). On the contrary, in the study conducted at Kollam, only 5.2% complained of sore throat, 15.2% had diarrhoea and 62.4% complained of abdominal pain.[10] In my study, 26% presented with skin rashes and eleven patients(11%) presented with bleeding manifestation, with Gastrointestinal tract(64%) as the common site of bleeding. The results are comparable to those from the study conducted at Kollam, where 33 patients (13.2%) had skin rashes and 38 patients (15.2%) presented with bleeding manifestation, in which gastrointestinal tract bleeding in the form of melaena was the most frequent.[10]

In my study, 22% presented with Hepatomegaly, 4% had Pleural effusion and only 1% had ascites. On the contrary, in the study conducted at Kollam, 17.6% had hepatomegaly, ascites were detected either clinically or by ultrasound in 30 patients (12%) and thirty three patients(13.2%) had pleural effusion[10]. In another study conducted at Delhi, hepatomegaly was seen in 20.4% of patients and Pleural effusion in 08.2% of patients.[11]

CONCLUSION

The present study concludes that, among Dengue cases admitted in a tertiary care hospital, Thrissur, Kerala, majority of them were males, coming from middle class families and residing in the northern part of Thrissur. The incidence of disease is more in age groups of less than 21 years and between 21 and 30 years. The most common clinical symptoms presented were fever and headache. Few of them had complications like hepatomegaly, and bleeding manifestation with gastrointestinal tract as the most common site of bleeding.

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REFERENCES

1. Gubler DJ. Dengue. In: Epidemiology of arthropod bore viral disease. Monath TPM, Boca Raton. 5th ed. Finland: CRC Press: 1988:223-60.
2. WHO fact sheet on dengue and severe dengue. Available at: https://www.who.int/en/news-room/fact-sheets/detail/dengue-and-severe-dengue. Accessed on 25 May 2020.
3. Carey DE, Myers RM, Reuben R, Rodrigues FM. Studies on dengue in Vellore, South India. Am J Trop Med Hyg. 1966;15:580-7.
4. Balaya S, Paul SD, D'Lima LV, Pavri KM. Investigations on an outbreak of dengue in Delhi in 1967. Indian J Med Res. 1969;57:767-74.
5. Myers RM, Carey DE, Banerjee K, Reuben R, Ramamurti DV. Recovery of dengue type 3 virus from human serum and Aedes aegypti in South India. Indian J Med Res. 1968;56(6):781-7.
6. Santosh Kumar PS, Arjun MC, Gupta SK, Nongkynrih B. Malaria, dengue and chikungunya in India – an update. Indian J Med Spec. 2018;9:25-9.
7. Chakravarti A, Arora R, Luxemburger C. Fifty years of dengue in India. Trans R Soc Trop Med Hyg. 2012; 106:273-82.
8. Mutheneni SR, Morse AP, Caminade C, Upadhyayula SM. Dengue burden in India: recent trends and importance of climatic parameters. Emerg Microbes Infect. 2017;6(8):e70.
9. Innis BL. Dengue and dengue hemorrhagic fever. In: Porterfield JS, eds. Exotic viral infection. 7th ed. Chapman & Hall, London, United Kingdom; 1995.

10. Daniel R, Philip AZ . A study of clinical profile of dengue fever in Kollam, Kerala, India. Dengue bulletin. 2005;40:25.
11. Sharma S, Sharma SK, Mohan A, Wadhwa J, Dar L, Thulkar S, et al. Clinical Profile of Dengue Haemorrhagic Fever in Adults during 1996 – Outbreak in Delhi, India. Dengue Bulletin. 1998;22:20.
12. Khormi HM and Kumar L. Examples of using spatial information technologies for mapping and modelling mosquito-borne diseases based on environmental, climatic and socio-economic factors and different spatial statistics, temporal risk indices and spatial analysis: A review. J Food Agric Environ. 2011;9(2):41-9.
13. Polwiang S. The seasonal reproduction number of dengue fever: impacts of climate on transmission. PeerJ. 2015;3:e1069.
14. Turbadkar D, Ramchandran A, Mathur M, Gaikwad S. Laboratory and clinical profile of dengue: A study from Mumbai. Ann Trop Med Public Health. 2012;5:20-3.

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