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Original Research Article

Frequency and trend of dengue fever in a tertiary care hospital in Kancheepuram, Tamilnadu: three-year retrospective study

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ABSTRACT

Background: Dengue is a mosquito borne viral disease which is endemic in the tropical and subtropical regions. In the recent years it has become a significant public health problem and its incidence is increasing in India. In 2016 1.1 lakh new dengue cases were reported in India. The objectives of the study was to describe the frequency and distribution of dengue infection and to determine the association between dengue infection and selected variables.
Methods: The study is a hospital based retrospective study conducted in a tertiary care hospital in a rural area of Kancheepuram district. Three-year data (January 2015 to December 2017) was collected from the medical records department of the hospital. Dengue cases were diagnosed by ELISA test.
Results: Among 340 dengue patients admitted in the hospital 240 (74.5%) were male and 100 (25.5%) were female. In this study, 306 (90%) patients were of the classical dengue type and 34 (10%) patients belong to dengue haemorrhagic fever type. There is a spike in the case load after the monsoons. There was a positive statistical significant association ($p<0.0001$) between dengue infection and male sex, low socioeconomic status and platelet count at the time of admission.
Conclusions: Results of the study indicate that there should be proper education of the public through various available Medias and awareness campaigns. All dengue patients must be appropriately treated in order to prevent complications. The national vector borne disease control program must extend its coverage to combat dengue infection.

Keywords: Dengue, Mosquito, Viral disease

INTRODUCTION

Dengue is vector borne viral infection transmitted by bite of mosquitoes mainly affecting tropical and subtropical regions of the world.[1] Dengue virus has four serotypes (DEN 1-4) among which serotype DEN 2 is most common in India.[2] The Dengue name is derived from the word *'Ki denga pepo'*, which means sudden seizure by the demon in the Swahali language.[3] Benjamin Rush called dengue fever as break bone fever after the 1780 tragic epidemic in Philadelphia.[4] Dengue fever causes a significant morbidity and mortality in the tropical regions and nearly 2/5th of the global population living in high risk areas for dengue infection.[5] Global prevalence of dengue fever is increasing over the years and it is endemic in nearly 100 countries.[6,7]

Majority of dengue fever cases presents as a self-limiting illness and rarely they go in for severe complications like dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS).[8] The two factors which are associated with increased severity of dengue infection are secondary dengue infection and infection with virulent viral strain.[9] Early diagnosis of the dengue infection remains the cornerstone for treatment and prevention of dreadful complications like DHF and DSS.[10,11] Till date there is no

vaccine or specific anti-viral drug to treat dengue infection and hence vector control remains the only option to bring down he burden from the disease.[12,13]

In India the firs epidemic was reported in 1780 in the metropolitan city of Chennai in Tamil Nadu.[1] Dengue fever is endemic in 34 states/UT of India. During 2009-2017 in India 683,545 dengue cases and 2,576 dengue deaths were reported as per the national vector borne disease control program surveillance data.[15] Case fatality rate due to dengue is more than 1 over the last decade.[16] In Tamil Nadu during 2018, overall 4,486 people were affected by dengue and 13 deaths were also reported.[17]

With this background this three-year retrospective study was planned in Kancheepuram district of Tamil Nadu with the objectives to describe the frequency and distribution of dengue infection and to determine the association between dengue infection and selected variables.

METHODS

It was a hospital based retrospective observational study conducted for a period of 3 months (January 1st 2018 to March 31st 2018).

Study area

The study was conducted in Sree Balaji medical college and hospital in Kancheepuram district, Tamil Nadu which is tertiary care teaching hospital.

Study population

Dengue patients belonging to all age group were chosen as the study participants.

Sampling method

Dengue patient's records from the medical records department of the hospital were selected using universal sampling method.

Sample size

In the three-year time period 340 dengue patients were admitted in the hospital and they all were taken as study samples.

Data collection

Records of 340 dengue patients obtained from medical records department of the hospital were reviewed for the period of 3 years (2015 -2017). Dengue was diagnosed in the hospital by ELISA. Details about Socio-demographic features, type of dengue, and platelet count at the time of admission were taken from the records.

Statistical analysis

The data was entered in Microsoft excel and analysed using SPSS 22 version. Descriptive and analytical statistics were used to explain the study variables.

Ethical approval

The study was approved by the Institutional Ethics Committee, Sree Balaji Medical College and Hospital.

RESULTS

Frequency distribution of dengue infection

Among the study participants 240 (74.5%) were males and 100 (25.5%) were females. Table 1 shows majority of the dengue patients belonged to 20-40 years of age 168 (48%).

With respect to socio economic status nearly 63% of dengue cases belonged to lower class and 27% belonged to middle class. In this study, 306 (90%) patients were of the classical dengue type and 34 (10%) patients belong to DHF type.

Table 1: Frequency distribution of dengue infection.

Socio-demographic variables	Classical dengue fever		DHF	
	Frequency (n=306)	Percentage (%)	Frequency (n=34)	Percentage (%)
Age (in years)				
<20	43	14	5	15
20-40	152	49	16	47
40-60	81	28	8	23
>60	30	9	5	15
Sex				
Male	213	70	27	79
Female	93	30	7	21
Socioeconomic status				
Upper class	33	11	3	9
Middle class	77	25	10	29
Lower class	196	64	21	62

Sex wise distribution of dengue infection

In this study Figure 1 depicts the sex wise distribution of dengue infection. Nearly 74.5 % of the patients were males and 25.5% were females. Among classical dengue cases 70% (213) were male and 30% (97) were females. Also among DHF cases 79% (27) were males and 21% (7) were females respectively

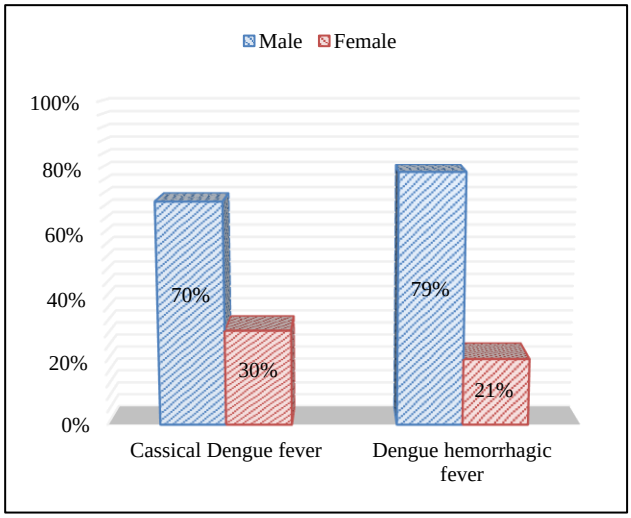

Figure 1: Sex wise distribution of dengue infection.

Trend of dengue infection

In the three-year study period more number of cases were reported in the year 2017 (61.7%) and followed by 2015 (30.3%) which is similar to the national level dengue statistics. During 2016 there is a significant drop in the no of reported dengue fever cases accounting for only 18% of the total, shown in Table 2.

Trend of dengue infection over the three years period is represented in Figure 2. It clearly shows that there is an increase in the dengue cases after the months of June and July and also there is highest peak in the cases following the rainy seasons (September-November). During the January to May months there is the drop in the reported cases.

Table 2: Year wise distribution of dengue infection.

Year	Frequency (n-340)	Percentage (%)
2015	103	30.3
2016	61	18
2017	176	61.7

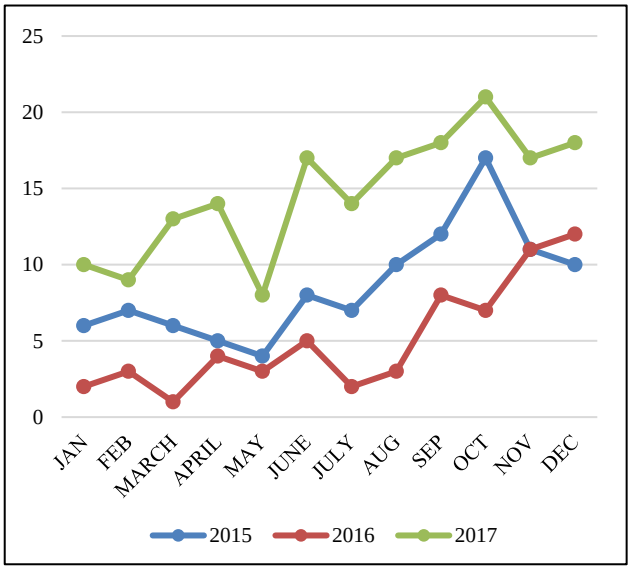

Figure 2: Trend of dengue infection.

Association between dengue infection and selected variables

As we can see from Table 3 there was a positive statistical significant association (p<0.0001) between dengue infection and male sex, lower socioeconomic status and platelet count at the time of admission. There is no statistical association between age and dengue infection (p=0.105) in this study.

Table 3: Association between dengue infection and selected variables.

Variable	Dengue infection	Chi-square value	P value	Degree of freedom
Age (in years)				
<20	48	6.138	0.105	3
20-40	168			
41-60	89			
>60	35			
Sex				
Male	240	87.619	<0.00*	1
Female	100			
Socio-economic status				
Upper class	36	16.577	<0.000*	2
Middle class	87			
Lower class	217			

Continued.

Variable	Dengue infection	Chi-square value	P value	Degree of freedom
Platelet count at the time of admission				
<50,000/mm^3	85	80.000	<0.000*	3
50,000-1 lakh/mm^3	146			
1-1.5/lakh mm^3	75			
>1.5 lakh/mm^3	34			

*p value<0.0001 is highly significant statistically.

DISCUSSION

In present study 240 (74.5%) were males and 100 (25.5%) were females. Male preponderance of cases were also seen in studies by Antony et al (60.70% were males and 39.29% were females), Garg et al (67% were males and 33% were females) and Kumar et al (64.6% were males and 35.4% were females) but, female preponderance was seen in study by Padhi et al.[11,18-20] Majority of the dengue patients belonged to 20-40 years of age in our study which is similar to study by Antony et al (>20 years) and also it is discordant to studies by Padhi et al (11-20 years) and Garg et al (0-15 years).[11,18,19]

Nearly 90% of the study participants belonged to classical dengue and only 10% were of DHF type. In Antony J study 97.65% classical dengue and only 2.35% were of DHF type and also Sharma did a study in Delhi in which 58.9% had classical dengue, 37.6% had DHF, and 3.38% had dengue shock syndrome.[18,21]

Among the study participants there is an increase in the dengue cases after the months of June and July and also there is highest peak in the cases following the rainy seasons (September-November). This finding is consistent with studies by Gunasekaran et al, Bhat et al and Dash et al.[22-24] this trend is because of the increase in the breeding place for the vectors during the post monsoon period.

In present study the variables significantly associated with dengue infection are male sex, lower socioeconomic status and platelet count at the time of admission and about 67.9% of the dengue patients had a platelet count of <1 lakh mm^3 at the time of admission which is similar to studies by Sirisena et al and Guzmán et al.[25,26]

CONCLUSION

Results of the study clearly indicate that there should be proper education of the public through various available Medias and awareness campaigns. Majority of the cases were reported during the post monsoon period which warrants a coordinated action towards the vector control measures. Active participation from the public is an essential component to curb down the problem. There is also an urgent need to develop a vaccine which is effective against all 4 serotypes of dengue virus.

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