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Statistics

Trend & Pattern of Dengue cases in a Tertiary Care Hospital in Pune, Maharashtra

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Abstract **Original Research Article**

Dengue virus is a mosquito-borne flavivirus and one of the most prevalent arbovirus in tropical and subtropical regions of the world. Dengue virus infection has emerged as notable public health problem in recent decades especially in the tropical and subtropical countries because of high mortality and morbidity associated with it. The study was performed in the record department of Medical College & Hospital, pune over a period of three years (From January 2014 to December 2016) with2490 clinically suspected patients attending the hospital & suffering from fever for at least five days. Blood was collected aseptically from suspected cases, serum was separated and analyzed by IgM capture ELISA technique to detect Dengue specific IgM antibodies. In this study, the highest numbers of cases (57.31%) were recorded in the age group 10–29 yrs with male preponderance and majority belonging to urban area. In present study the positivity rate of the dengue positive cases were decreasing over study period from 24.04% to 11.92%. A seasonal variation is also observed as there is an increasing no. of cases from July onward i.e. monsoon period in months from August to November. The no. of cases started rising from August and peaks at October, during all three years of the study. Community awareness, early diagnosis and management and vector control measures need to be strengthened in order to reduce the increasing number of dengue cases. Special preventive strategies should be planned during post monsoon period. Every case of fever should visit physician immediately to prevent complications, in rural as well as urban areas.

Keywords: Trend & Pattern, Dengue virus, fever, Community awareness.

INTRODUCTION

Dengue virus is a mosquito-borne flavivirus and one of the most prevalent arbovirus in tropical and subtropical regions of the world. Dengue virus infection has emerged as notable public health problem in recent decades especially in the tropical and subtropical countries because of high mortality and morbidity associated with it. Dengue with its two severe clinical manifestations dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS) is endemic in India and epidemics are frequently reported from many parts of India and abroad. Dengue fever is a recurrent problem in Maharashtra. In Pune Dengue was first documented in 1824. Thereafter several epidemics of Dengue were observed in Pune in 1836, 1906, 1911 and 1923 with a severe epidemic in 1923 affecting about 40% of people [1]. In India, DHF was first reported in Kolkata in 1963-64 where 200 people died. Another small outbreak of DHF in Pune occurred in 1990 where 12 children died. Recently, there has been a large outbreak in 2005 involving all districts of Maharashtra with 6293 cases and 27 deaths. In Pune alone 3967 persons were affected with 14 deaths, this has been followed by smaller number of cases occurring in subsequent years [2]. With increasing global temperature and associated climatic changes there are apprehensions about an outbreak in coming years. Dengue virus is a positive-stranded encapsulated RNA virus.

OBJECTIVES

- To find out the prevalence of Dengue among the symptomatic patients attending a tertiary care hospital in Pune.
- Documentation of the present scenario and recent trends of Dengue among the symptomatic patients attending the same hospital in pune.

MATERIALS & METHODS

The study was performed in the record department of Medical College & Hospital, pune over a

period of three years (From January 2014 to December 2016) with2490 clinically suspected patients attending the hospital & suffering from fever for at least five days. Blood was collected aseptically from suspected cases, serum was separated and analyzed by IgM capture ELISA technique to detect Dengue specific IgM antibodies.

Inclusion Criteria Were As Follows

Fever with two or more of the following symptoms- rash, bodyache, malaise, myalgia, arthralgia and retroorbital

RESULTS

A total of 15,064 suspected cases were tested by dengue IgM Capture ELISA over three years and 2490 samples were found to be reactive (16.53%). The study shows that there is decreasing trend of dengue cases from 2014 (46.67%) to 2016 (26.27%). A total of 1599 (64.22%) cases were male whereas 891 (35.78%) cases were female which clearly indicates male predominance over female cases throughout the study period.

Table-1: Yearwise and Sexwise Distribution of Dengue Cases

YEAR	SEX		
	MALE	FEMALE	TOTAL
2014	761	401	1162(46.67%)
2015	442	232	674(27.07%)
2016	396	258	654(26.27%)
TOTAL	1599(64.22%)	891(35.78%)	2490(100%)

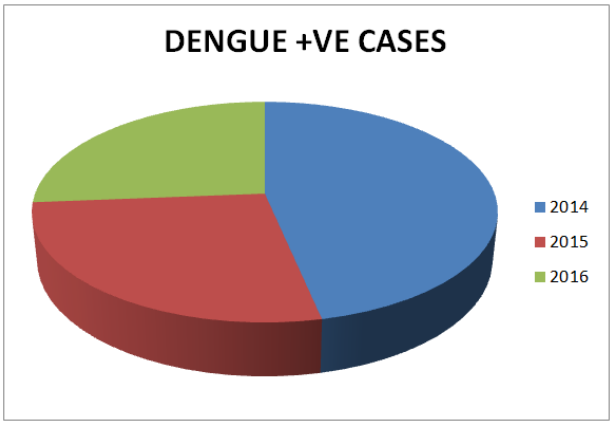

Fig-1: Shows the trend of dengue positive cases over study period

Table-2: Positivity Rate of Dengue Cases During The Study Period

YEAR	Dengue +ve Samples	Tested Samples	Positivity Rate	Total Samples
2014	1162	4833	24.04%	2490/15064
2015	674	4743	14.21%	positivity rate is 16.53%
2016	654	5488	11.92%	

Table-2 shows that the positivity rate of the dengue positive cases were decreasing over study period from 24.04% to 11.92%.

Table-3: Age & Sex Distribution of Dengue Cases

Age group	Year		
	MALE	FEMALE	TOTAL
<10 yrs	74	72	146(5.86%)
10-29yrs	986	441	1427(57.31%)
30-49yrs	408	263	671(26.95%)
>50yrs	131	115	246(9.88%)
TOTAL	1599	891	2490(100%)

Table-3 shows that the proportion of dengue cases was observed higher in age group 10 -29 and 30-49 years whereas it was seen lower in <10 years and >50 years people. This clearly indicates that children and elderly are at lower risk as compared to middle aged population in present study. Again male predominance is observed among high risk age groups.

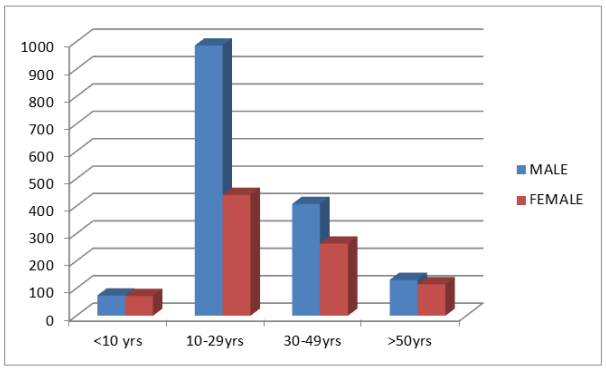

Fig-2: Shows the distribution of male and female in different age groups

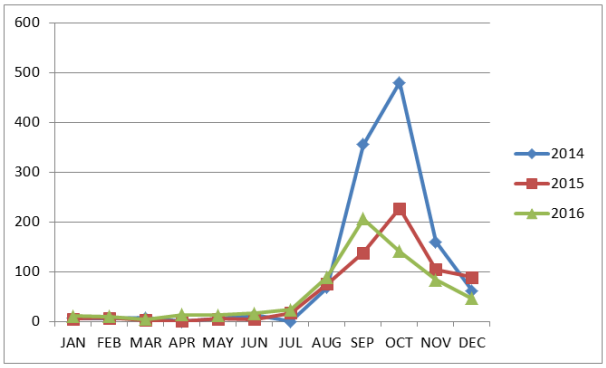

Fig-3: Shows the Month wise seasonal distribution of Dengue cases

Table-4: Residence wise Distribution of Dengue Cases

YEAR	RESIDENCE		
	URBAN	RURAL	TOTAL
2014	1037	125	1162
2015	574	100	674
2016	535	119	654
TOTAL	2146	344	2490

Table-4 shows that maximum number of cases are reported urban area as compared to rural areas. This could be due to the rapid urbanization with unplanned construction activities and poor sanitation facilities contributing fertile breeding grounds for mosquitoes. Due to an increase in the alertness among medical fraternity following the initial epidemic and the availability of diagnostic tools in the hospital have contributed to the increased detection of cases.

Table-4: Seasonal Distribution of Dengue Cases

MONTH	YEAR			
	2014	2015	2016	TOTAL
JANUARY	6	5	11	22
FEBRUARY	6	7	10	23
MARCH	7	2	4	13
APRIL	0	1	13	14
MAY	6	5	12	23
JUNE	12	4	16	32
JULY	0	17	23	40
AUGUST	68	75	89	232
SEPTEMBER	355	138	206	699
OCTOBER	480	227	141	848
NOVEMBER	160	104	83	347
DECEMBER	62	89	46	197
TOTAL	1162	674	654	2490

There is an increasing no. of cases from July onward i.e. monsoon period in months from August to November. The no. of cases started rising from August and peaks at October, during all three years of the study. No. of cases were less from January to May months. Pre monsoon increase in the number of cases was noted in the months of June and July due to stagnation of water, after a few bouts of pre-monsoon rainfall which facilitates vector breeding.

These findings highlight that preventive measures against dengue infection should be taken during water stagnation periods after the initial bout of rainfall and at the end of monsoon.

Table-5: Treatment outcome of Dengue Cases

YEAR	TREATMENT OUTCOME		
	DIED	SURVIVED	TOTAL
2014	9(0.77%)	1153(99.23%)	1162
2015	5(0.74%)	669(99.26)	674
2016	12(1.83%)	642(98.17%)	654
TOTAL	26(1.04%)	2464(98.96%)	2490

Table-5 shows that present study reported very low mortality rate however it should aim to reduce the mortality rate to zero. This can be done by Implementing timely, appropriate Clinical management, which involves Early clinical and laboratory Diagnosis, intravenous rehydration, Staff training and hospital reorganization.

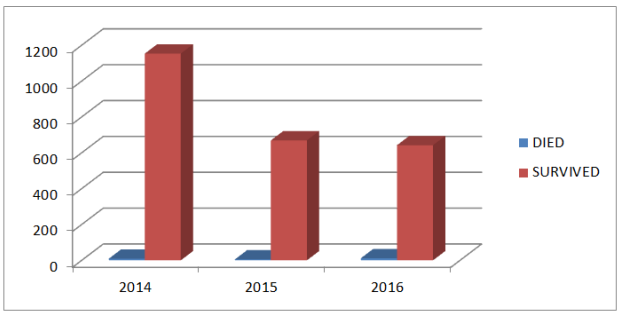

Fig-4: Shows the Mortality of Dengue cases

DISCUSSION

The present study had concentrated on the epidemiology and trend of Dengue fever in a tertiary care hospital of Pune city since 2014 to 2016. In this study, the highest numbers of cases (57.31%) were recorded in the age group 10–29 yrs with male preponderance. Findings of Sanjeev Das *et al*., Kulkarni S K, Gupta *et al.*, [3-5] and Chakravarti and Kumaria [6] were similar to our study i.e, maximum cases in the age group 21–30 years and male patients clearly outnumbered female patients. However Sarkar *et al*., [7], reported that maximum cases were in the age group ≤10 years and there was female preponderance. The majority of the cases were reported during the post monsoon seasons (August to November) with a peak during September and October in all the past three years (2014-2016), in accordance with the established findings by P. Reiter [8]. Our finding in this present study corroborates with the findings of Hati [9], Taraphdar *et al.*, [10], and Sarkar *et al.*, [11].

CONCLUSION

Dengue is the most common infection causing mortality and morbidity mainly among productive age group. Most of the patients were males and from Urban residence. Most cases occur during post monsoon period i.e. September-December. Community awareness, early diagnosis and management and vector control measures need to be strengthened in order to reduce the increasing number of dengue cases.

RECOMMENDATIONS

Special preventive strategies should be planned during post monsoon period. Every case of fever should visit physician immediately to prevent complications, in rural as well as urban areas.

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