Original Research Article

A study on the distribution of Dengue positive cases in Pune City in India

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Abstract: Dengue fever is mosquito-borne tropical disease caused by the dengue virus. Its symptoms typically begin three to fourteen days after infection. With this background in mind present study was done to study on the distribution of dengue positive cases in our city, Pune in India. The present study work was done at Rao Nursing Hospital at Pune. Analysis of Dengue data from 1 Jan 2015 to 31 Dec 2015 was done. Samples send for the suspected cases of Dengue fever patients admitted in Hospital for NS1 antigen ELISA and IgM ELISA. It is observed that the incidence of dengue cases was noted in central city area as well as in Katraj area of city. It may be due to central area due to high population density. It may be conclude that the dengue number of cases is observed in central city area of Pune city. However public health education by City health authorities, hospital based counseling during OPD hours can show significant impact for reducing or prevention of dengue fever.

Keywords: dengue cases, Pune city.

INTRODUCTION:

Dengue fever is mosquito-borne tropical disease caused by the dengue virus [1]. Its symptoms typically begin three to fourteen days after infection[2]. This may include a high fever, headache, vomiting, muscle and joint pains, and a characteristic skin rash[1-2]. Recovery generally takes less than two to seven days [1]. In a small proportion of cases, the disease develops into the life-threatening dengue hemorrhagic fever, resulting in bleeding, low level of blood platelets and blood plasma leakage, or into dengue shock syndrome, where dangerously low blood pressure occurs [2]. The global epidemiology of dengue fever/dengue hemorrhagic fever (DF/DHF) is changing fast [1]. The Indian encounter with this disease is interesting and intriguing. Dengue infection has been known to be endemic in India for over two centuries as a benign and self-limited disease. In recent years, the disease has changed its course manifesting in the severe form as DHF and with increasing frequency of outbreaks. Delhi, a city in North India, has experienced seven outbreaks of dengue virus infection since 1967 with the last reported in 2003 [2-4]. The 1996 epidemic in India was mainly due to the virus dengue -2[2]. While in 2003 all four serotypes of dengue viruses were found in co-circulation [5]. An estimated 390 million dengue infections occur worldwide each year, with about 96 million resulting in illness. Most cases occur in tropical areas of the world like India. With this background in mind present study was done to study on the distribution of dengue positive cases in our city, Pune in India.

METHODOLOGY:

The present study work was done at Rao Nursing Hospital at Pune. Analysis of Dengue data from 1 Jan 2015 to 31 Dec 2015 was done. Samples send for the suspected cases of Dengue fever patients admitted in Hospital for NS1 antigen ELISA and IgM ELISA .The sample size was determined with help of expert statistician. The cases confirmed as Dengue were included in present study while other suspected cases were rule out and excluded from present work.

A total of 329 serum samples from equal number of clinically suspected dengue fever were collected. Since our laboratory works round the clock, the samples were tested immediately for NS1, IgM and IgG by ICT-based tests. The tests were performed strictly as per the declared manufacturer's instructions. Platelet counts of all the cases positive for any of the dengue parameter were noted. Platelet counts were also

recorded in 329 cases of fever that were negative for any of the dengue parameter. The permutations and combinations of dengue-specific parameters were correlated with thrombocytopenia using standard error of proportions test. The count was done at admission, during follow up and at discharge.

RESULTS
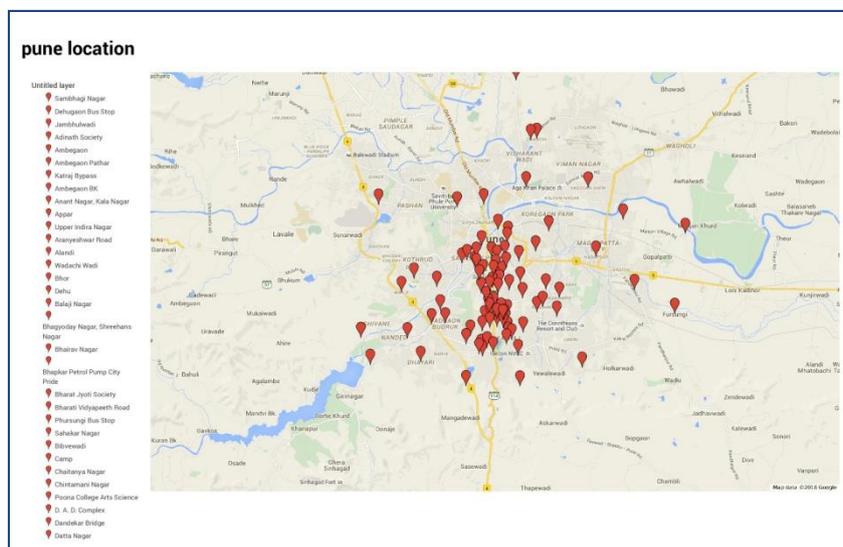
Photograph: Location wise map with dengue cases of Pune City

Table 1: Analysis of distribution of dengue cases: (N = 329)

S NO	Area	Number of cases	Percentage
1	Central City	228	69.03
2	Swargate	24	7.29
3	Katraj	28	8.51
4	Vimannager	2	0.60
5	Adgaon Budruk	3	0.91
6	Magarpatta city	1	0.30
7	Fursungi	2	0.60
8	Dhayari	2	0.60
9	Pashan	1	0.30
10	Others	38	11.55
		329	

It is observed that the incidence of dengue cases was noted in central city area as well as in Katraj area of city. It may be due to central area due to high population density.

DISCUSSION

The diagnosis of dengue fever may be confirmed by microbiological laboratory testing. This can be done by virus isolation in cell cultures, nucleic acid detection by PCR, viral antigen detection (such as for NS1) or specific antibodies (serology) [6, 7]. Virus isolation and nucleic acid detection are more accurate than antigen detection, but these tests are not widely available due to their greater cost. Detection of NS1 during the febrile phase of a primary infection may be greater than 90% sensitive however only 60–80% in subsequent infections is. All tests may be negative in the early stages of the disease. PCR and viral antigen detection are more accurate in the first seven days. In

2012 a PCR test was introduced that can run on equipment used to diagnose influenza; this is likely to improve access to PCR-based diagnosis [8].

Dengue is emerging as a major public health problem in India. Since the first epidemic in Kolkata during 1963–64 many places in India have been experiencing dengue infection [9]. One of the largest outbreaks in North India occurred in Delhi and adjoining areas in the year 1996.

The present study reports the incidence of dengue cases was noted in central city area as well as in Katraj area of city. It may be due to central area due to high population density Translational research is dynamic and multidisciplinary research approach applies discoveries from basic science to apply to increase quality of human health [10]. The laboratory data should be symmetrically collected and analyzed on

large scale can be helpful . Such studies will can be done with use of current new technologies used in medical research [11]. The study conducted by Tayade MC *et al.;* about robotics is good example. Such type of format can be used like inclusion of number of other Hospitals [12].

There are no specific medications to treat dengue, and there is no vaccine available against it. Therefore prevention is the most important step to reduce the risk of dengue infection. There are various measures that may affect the dengue. First important step is to mosquito control by either larval control or adult mosquito control. And second step is reducing mosquito bites during daylight time. Since many mosquitoes breed in standing water, source reduction can be as simple as emptying water from containers around the home. This is something that homeowners can accomplish. For example, homeowners can eliminate mosquito breeding grounds by removing unused plastic pools, old tires, or buckets; by clearing clogged gutters and repairing leaks around faucets; by regularly (at least every 4 days) changing water in bird baths; and by filling or draining puddles, swampy areas, and tree stumps. Eliminating such mosquito breeding areas can be an extremely effective and permanent way to reduce mosquito populations without resorting to insecticides.

Control of adult mosquitoes is the most familiar aspect of mosquito control to most of the public. It is accomplished by ground-based applications or via aerial application of residual chemical insecticides such as Duet. Generally modern mosquito-control programs in developed countries use low-volume applications of insecticides, although some programs may still use thermal fogging. Besides fogging there are some other insect repellent for indoors and outdoors. To control adult mosquitoes in India, van mounted fogging machines and hand fogging machines are used.
In our study we noticed that addressing control of mosquito breeding, educate awareness of locality, control of vector, intimated the PMC and they took a survey played vital role. Especially in central part of city, after survey it was noted that the sources were less affected even after measures done by Municipal Corporation.

Further studies regarding the molecular characterization of these dengue-3 viruses are underway. Epidemiology of dengue infection in urban zones of India is rapidly changing face, with frequency of outbreaks increasing, even as dengue establishes itself as endemic disease [13]. The need of the hour is to characterize the circulating serotypes of dengue virus in our community and understand the evolutionary processes influencing the dengue virus, as this is

expected to impact on vaccination strategies for future. However public health education by City health authorities, hospital based counseling during OPD hours can show significant impact for prevention of dengue fever.

CONCLUSION
It is observed that the incidence of dengue cases was noted in central city area as well as in Katraj area of city. It may be due to central area due to high population density. In our study we noticed that addressing control of mosquito breeding, educate awareness of locality, control of vector, intimated the PMC and they took a survey played vital role. Especially in central part of city, after survey it was noted that the sources were less affected even after measures done by Municipal Corporation.

REFERENCES
1. Dengue and severe dengue Fact sheet N°117, WHO. May 2015. Retrieved 3 February 2016.
2. Kularatne SA; Dengue fever. BMJ (Clinical research Ed.) 2015; 351: h4661.
3. Normile D; Surprising new dengue virus throws a spanner in disease control efforts. Science. 2013; 342 (6157): 415.
4. Gupta E, Dar L, Kapoor G, Broor S; The changing epidemiology of dengue in Delhi, India. Virology Journal, 2006; 3(1): 1.
5. Maron, Dina (December 30, 2015). First Dengue Fever Vaccine Gets Green Light, Countries, Scientific American. Retrieved 3 February 2016.
6. Gubler D; Dengue and dengue hemorrhagic fever, Clin Microbiol Rev 11: 480-96.
7. Broor S, Dar L, Sengupta S, Chakaraborty M, Wali JP, Biswas A, et al.; Recent dengue epidemic in Delhi, India, In Factors in the emergence of arbovirus diseases. Edited by: Saluzzo JE, Dodet B. Paris: Elsevier; 1997; 123-7.
8. Dar L, Broor S, Sengupta S, Xess I, Seth P; The first major outbreak of dengue hemorrhagic fever in Delhi, India, .Emerg Infect Dis 1999; 5: 589-90.
9. Gupta E, Dar L, Narang P, Srivastava VK, Broor S; Serodiagnosis of dengue during an outbreak at a tertiary care hospital in Delhi, Indian J Med Res 2005; 121: 36-8
10. Tayade MC, Latti RG; Translational research in physiology: Review, Indian Journal of Basic and Applied Medical Research; 2015; 4(3): 405-414.
11. Tayade MC, Kulkarni NB; The Interface of Technology and Medical Education in India: Current Trends and Scope. Indian Journal of Basic & Applied Medical Research; 2011; 1(1): 8-12.
12. Karandikar PM ,Tayade MC; Application of Robotics technology in clinical practice in India ,

Asian Journal of Medical Sciences, September 2013; 5(1): 29-33

13. Dar L, Gupta E, Narang P, Broor S; Co-circulation of dengueserotypes 1,2,3 and 4 during the 2003 outbreak in Delhi, India , Emerg Infect Dis 2006; 12: 352-3