

Original Research Article

A study on incidence rate of dengue fever in rural area of Thiruvannamalai district

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ABSTRACT

Background: In Tamil Nadu, the dengue outbreak is often associated with monsoon periods clubbed with draught. Basic population statistics such as incident rate was needed very much. Hence this study was planned a) to know the incidence rate of dengue fever in Kattampoondi primary health centre area in Thiruvannamalai district and b) to find out age-sex pattern of the cases.

Methods: A longitudinal descriptive study was conducted among the residents of villages served by Kattampoondi primary health center during July to December, 2017. Four villages were selected by random sampling technique. The population came about 9385. Only confirmed dengue cases as per WHO case definition, during July to December 2017 were found and confirmed cases included thereafter.

Results: The total dengue cases in the study area with a population of 9385 were found to be 75. Among 75 cases of dengue, 43 (57%) were males and 32 (43%) were females. Out of 75 cases, 36 (48%) cases occurred in the age group of 15 and above, 34 (45%) cases occurred between 5 to 15 years of age and 5 (7%) cases occurred among under five.

Conclusions: When compared to state incidence rate, the incidence rate of this PHC area was significantly high. This might be due to good surveillance work. Though all age groups and both sexes are susceptible to dengue fever, personal protection might be the reason for low incidence rate among children with below 5 year of age.

Keywords: Dengue, Incidence, Population statistics

INTRODUCTION

Dengue fever is a vector borne disease.¹ The agent is the dengue virus. There are four dengue virus serotypes (DEN-1, DEN-2, DEN-3 and DEN-4) circulating in Asia, Africa and the America.² Infection with one of those serotypes does not have cross immunity, so people in endemic areas can have four different dengue infections during their lifetimes³. It is one of the most important emerging diseases of the tropical and sub-tropical region. For the past 3 decades the geographical distribution of the

disease has been widely expanded and hospital admission and mortality increased dramatically.⁴

Approximately 2.5 billion people live in dengue-risk regions with about 100 million new cases each year worldwide.⁵ The vector for dengue fever is the female *Aedes mosquito*.⁶ Prevalence of *Aedes aegypti* and *Aedes albopictus* together with the circulation of dengue virus of more than one type in any particular area tends to be associated with outbreaks of severe dengue.⁷ The epidemic has been cyclical in nature and reaches its peak during June to November.

In Tamil Nadu, the outbreak is often associated with monsoon periods clubbed with draught. People tend to store water for prolonged period. The climatic conditions and domestic water storage give ample opportunities to raise the vector mosquito population.⁸ In Thiruvannamalai district, it was observed that for the past 3 years, the outbreak starts on June or July, reached peak during August or September and tailed on December.

In our country, during 2016 there were 1,29,166 dengue cases reported all over the states and death toll was 245.⁹ However it was feared that there might be under reporting. In most instances the private practitioners failed to come forward to report the dengue cases. In public sectors, the physicians or the public health workers were forced to bring down the disease burden. The other side of this approach might lead to under reporting.¹⁰ Dengue cases may be missed due to decreased sensitivity of diagnostic tests.¹¹ Frequent sensitization programme for physicians, good surveillance system which included private practitioners and expectation over realistic goals might solve the problem of under reporting & missed diagnosis.¹²

Table 1 shows the recent incidence rate of dengue fever in Tamil Nadu and it was found to be 0.28/1000 during the year 2017.¹³ Recently dengue cases and deaths are being reported every year from all the states & almost all districts of Tamil Nadu. Still we don't have population statistics of dengue. Basic population statistics such as incident rate was needed very much to know the trend, containment, preventive measures and the effect of the preventive measures. Hence this study was planned to know the incidence rate of dengue fever in Kattampoondi primary health centre area in Thiruvannamalai district from July to December 2017 and to find out age-sex pattern of the cases.

METHODS

A longitudinal descriptive study was conducted among the residents of villages served by Kattampoondi primary health center during July to December, 2017. Kattampoondi PHC area has 5 sub-centers. Each sub-center has 3 to 5 villages. Total 21 villages were served by this PHC area catering 25,672 populations. Four villages were selected by random sampling technique. The population came about 9385 in these selected villages. Only confirmed dengue cases as per WHO case definition, during July to December 2017 were included in the study.¹⁴ The cases were out from fever register maintained in the primary health centre. Eight compulsory rotatory residential internees (CRRIs) of community medicine department were deputed for surveillance work during the study period. The index case was noted on 22nd July 2017 from a private hospital. CRRIs were engaged to do containment activities, fever surveillance and door to door survey in those areas along with the village health nurses. One private hospital was designated as sentinel site and cases were collected from

the designated hospital. Blood samples were collected from suspected cases with history of fever more than 2 days. Reports were collected and confirmed cases included thereafter. Intense search was made to find out cases of dengue fever whatever the disease spectrum. Data were entered in Microsoft excel and results were expressed in incidence rates and percentages.

RESULTS

The total dengue cases in the study area with a population of 9385 were found to be 75. This included 13 cases treated outside the study area and excluded 3 visitor cases. No fatality due to dengue has occurred in this area. A cluster of 7 cases were noted in one village named Nadupattu in the Mariammankovil Street with a population of 52. Another cluster of 8 cases were found in another village named S.Valavetti, where there was a secluded residential area with 21 inmates. This gave the incidence rate of 9/1000/year.

Table 1: The incidence rate of dengue fever in Tamil Nadu.

Year	Reported dengue cases	Population	Incidence rate/ 1000/year
2010	2,051	6,85,15,977	0.03
2011	2,015	7,25,73,144	0.03
2012	12,826	7,36,39,140	0.174
2013	6,122	7,43,19,757	0.082
2014	2,804	7,54,78,738	0.037
2015	4,535	7,66,56,206	0.059
2016	2,531	7,78,81,463	0.032
2017	22,197	7,90,96,413	0.28

Table 2 shows the age-sex distribution of dengue cases in the study population. Among 75 cases of dengue, 43 (57%) were males and 32 (43%) were females. Out of 75 cases, 36 (48%) cases occurred in the age group of 15 and above, 34 (45%) cases occurred between 5 to 15 years of age and 5 (7%) cases occurred among under 5.

Table 2: Age-sex distribution of dengue cases.

Age (in years)	Female	Male	Total
Under 5	2	3	5(7%)
5-14 years of age	14	20	34 (45%)
15 years and above	16	20	36 (48%)
Total	32 (43%)	43 (57%)	75

DISCUSSION

A community based longitudinal descriptive study conducted among villages of Thiruvannamalai district have showed that the incidence rate of dengue were 9 per

1000 population per year. A study conducted by Mutheneni et al have shown that highest incidence of dengue in India from 1998 to 2014 was at Pondicherry and the incidence rate was 372.2 per million population, which was much lower than the present study.¹⁵ When compared to Tamil Nadu state incidence rate, the incidence rate of the present study was significantly high.¹³ The reasons behind the high incidence rate in the study area could be that the villages in the study area were the villages among the few villages in Thiruvannamalai district that have witnessed dengue outbreak in 2017. The other reason behind high incidence rate might be due to good surveillance work. In the present study, the incidence of dengue was more among males when compared to females which was similar to a study conducted among six Asian counties.¹⁶ Majority of the dengue cases in the study area have occurred in the age group of 15 years and above, which was similar to a meta-analysis that have showed median age of dengue cases was 22 years.¹⁷ Though all age groups and both sexes are susceptible to dengue fever, personal protection might be the reason for low incidence rate among children with below 5 year of age. Few cases might have occurred outside the study period. These cases were not included due to logistic reason especially non-availability of CRRIs, as the motivated and trained CRRIs moved to next posting. The disease spectrum had not been analyzed in this study for the same logistic reason.

CONCLUSION

The present study have showed very high incidence rate of dengue in villages of Thiruvannamalai district, Tamil Nadu and dengue cases were more among males and in the age group of 15 years and above. Effective health education, stringent regulatory approaches and good surveillance were much needed to control and prevent dengue outbreaks.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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