



RESEARCH ARTICLE

A CASE STUDY ON RISE IN DENGUE CASES IN CONSTRUCTION AREAS OF GANDHINAGAR DISTRICT

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ABSTRACT

To understand the dynamics of Dengue transmission particularly in areas having construction sites of Gandhinagar district to plan and implement effective control measures. The study was conducted covering 3 Primary Health centers viz. Uvarsad, Adraj and Sughad where maximum construction sites were located. Detailed analysis of Dengue cases detected was undertaken. 64% of the confirmed cases were male patients, while 61 % falls in the age group of 20 to 45 years. 42 % of the total dengue cases in the district were contributed by the three PHCs where construction sites were more. Entomological survey revealed that 73% of positive mosquito breeding places were due to stagnation of water in under construction buildings. The study clearly brings out the fact that construction sites create an ideal environment for the transmission of vector borne diseases like Dengue. To prevent transmission top down driven activities involving contractors and site managers needs to be effectively implemented. Adequate preventive measures at the construction sites and enforcement of legislative measures with penalty are necessary.

INTRODUCTION

Vector Borne Diseases like Malaria, Dengue and Chikungunya (since 2006) are major public health problems in Gujarat. Dengue is a matter of concern as it accounts for very high morbidity in the community as the actual number of cases will be much higher than reported figures. The geographical expansion of Dengue has been quite rapid in the entire World, in India and also in Gujarat. This disease which was considered as an urban phenomenon till few years ago has now spread its tentacles to the rural areas including tribal belts due to the availability of the breeding places for vector mosquitoes (*Aedes aegypti*). The rapid urbanisation, rapid transportation facilities, construction activities and absence of proper environmental management measures directed towards source reduction has allowed the disease to spread to newer areas and now has become endemic in most parts of the country including Gujarat. As no effective treatment is available for Dengue any disruption in routine vector control measures particularly during the post monsoon period facilitates transmission of this disease. Gandhinagar district in Gujarat has achieved very good success in controlling malaria under National Vector Borne Disease Control Programme mainly adopting an integrated approach for prevention and control as well as by having synergistic approach which has become possible with the implementation of National Rural Health Mission.

However the success that was possible in the field of malaria control could not be replicated in control of Dengue as cases increased to 171 in 2015 as compared to 44 in 2014. This was a challenge and it was decided to find out the reasons for the increase in Dengue cases in Gandhinagar district, so that appropriate and time bound measures can be taken for effective control. The present study is a first step in this direction. The factors which contributed towards the increase in Dengue cases in 3 PHCs of the district which accounted for the maximum cases were studied in detail.

MATERIALS AND METHODS

Gandhinagar district is having a total population of 12.33 lakhs and comprises of 4 talukas, 302 villages, 26 primary centres with 914 ASHAs (since 2009), 7 Community Health Centres, and 2 Hospitals including one Medical College. Taluka wise details are given in Table 1. The district is having very good road connectivity and the literacy rate is higher as compared to State average 84.2 %. The study was conducted in the district focusing on 3 PHCs viz. Adraj, Uvarsad and Sughad with maximum construction sites, having 29 villages, 16 sub centres and a population of 1.32 lakh population. Profile of these three PHCs is given in Table 2. As regards Dengue preventive and control measures, PHC is considered as an operational unit. Surveillance for Dengue is mainly carried out through the sentinel centre made functional in GMERS Medical college Gandhinagar and also other nearby centres like B.J. Medical College Ahmedabad and GMERS Medical college Sola.

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Table 1. Demographic details and health infrastructure in Gandhinagar district

Taluka	Population	Villages	PHCs	CHCs	Hospitals	Medical college	ASHA
Gandhinagar	345817	73	8	3		1	286
Dehgam	278935	93	7	2			225
Mansa	233249	66	5	1	1		177
Kalol	375011	70	6	3			226
	1233012	302	26	9	1	1	914

Table 2. Demographic details and health infrastructure in PHCs covered under study

PHC	Population	Villages	MPHWs	FHWs	ASHAs	SCs	Construction sites
Adraj	41501	8	8	8	40	8	16
Uvarsad	42636	8	7	7	36	8	19
Sughad	48449	13	7	7	36	8	66
Total	132586	29	22	22	112	24	101

Table 3. dengue situation in PHCs covered under study in 2014 and 2015

PHC	Cases detected 2014	Cases detected 2015	% increase
Uvarsad	14	50	257.0
Adraj	4	49	1125.0
Sughad	2	48	2300.0

Table 4. Age and sex wise analysis of Dengue cases in PHCs covered under the study

PHC	Sex wise contribution		Total	Age wise contribution			
	Cases Male	Cases Female		Cases	0-5	5-20	20-45
Uvarsad	32	18	50	00	14	36	0
Adraj	29	20	49	1	21	24	3
Sughad	34	14	48	2	9	31	6
	95	52	147	3	54	91	9

List of Dengue cases confirmed at these centres having complete details of the patients are communicated on a day to day basis to the district. Subsequently epidemiological investigations are carried out and transmission control measures such as anti larval and anti adult measures are undertaken within 24 to 72 hours. The cases reported through the sentinel centres were taken up for this study. Efforts were also made to get details of confirmed Dengue cases from the private hospitals and laboratories too.

DISCUSSION

Based on the line list of Dengue cases compiled and verified in the field detailed analysis was done and it was observed that Cases of Dengue increased alarmingly in 3 PHC areas having construction sites in 2015 as compared to 2014³. PHC wise details are given in Table 3. Out of the total 348 cases reported in the district, 3 PHCs having 101 construction sites which are the maximum in the district contributed 147 cases (42 %). The age and sex wise analysis of Dengue cases detected in the district was also undertaken as shown in Table 4. Out of the total cases of these three PHCs 64 % were males giving an indication that working class group has more chances of acquiring the infection. Age wise analysis revealed that 61 % were in the age group of 20 to 45 years which again proves the above observation, while 39 % of cases were from other age groups. Concerned PHCs took the required preventive measures covering 16 villages. 373 major breeding habitats were searched and such sites which were positive for Aedes breeding were treated with larvicide (Temephose), while 1736 houses/buildings were covered under indoor fogging. But the efforts of the health authorities were not supplemented adequately by the construction authorities at that time which allowed the transmission of dengue and facilitated to spread the disease to the nearby areas /local population.

Entomological survey carried out in these areas periodically revealed that *Aedes aegypti* is the principal vector and about 40% of the breeding habitats were lift columns while 33% were such places where water stagnation occurred on the lowest floor. Stagnant water in discarded materials was another source for breeding (10%).

Conclusion

The study clearly brings out the fact that construction sites create an ideal environment for the transmission of vector borne diseases like Dengue. In this study the case load has increased in areas where there was concentration of such sites. The vector *Aedes aegypti* mosquitoes and the virus causing the disease were already prevalent in these areas. Inadequate steps particularly by the construction authorities facilitated the spread (geographical expansion) of dengue. To prevent transmission top down driven activities involving contractors and site managers needs to be effectively implemented. Adequate preventive measures at the construction sites and enforcement of legislative measures with penalty are necessary. Awareness activities for workers/labourers to facilitate their support are also equally important. Periodic visits of such construction sites with help of a comprehensive checklist will help in identifying the gaps and taking appropriate steps. Disease surveillance by government as well as private agencies needs strengthening at the grass root level for timely implementation of preventive measures to interrupt transmission

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