CASE REPORT

A rapid assessment of some clinical and entomological indices in East, Central and North zones of Ahmedabad municipal corporation, Gujarat, India

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ABSTRACT

Vector borne diseases are the major tropical health challenges and leading cause of morbidity and mortality in the world. Present study was carried out for rapid assessment of morbidity and mortality due to vector borne diseases, entomological surveillance and preventive vector control measures taken by the health authority. Rapid assessment was carried out in the East, Central and North zones, which caters high risk areas and migrant population, of Ahmedabad city. House to house survey carried out in all the wards of 3 assigned zones for fever cases, deaths and breeding places of mosquito. Data was also collected from Urban Health Centre, Private clinics, trust hospitals and different laboratories in the wards. Epidemiological interpretation of various Entomological indices like House Index, Container Index and Breteau Index were done by WHO norms. Total 2800 houses and 14077 family members were surveyed. Total 5841 containers were checked. House index was 1.22%, 1.55% and 1.4%; Container index was 0.46%, 0.9% and 0.8%; Breteau index was 1%, 1.78% and 1.4% accordingly in three zones namely East, South & Central. Entomological indices were well controlled and in correlation with the fever cases in different areas of different zone and VBDs were also under control.

Key words: *Control measures, entomological indices, IEC activities, vector borne diseases*

Mosquitoes apart from a biting nuisance, are responsible for transmitting diseases like Malaria, Filaria, Dengue, Dengue Hemorrhagic Fever, etc. [1].Malaria and other vector borne diseases are one of the major tropical health challenges in the world today [2]. Vector borne diseases mainly malaria remains leading cause of morbidity and mortality worldwide, at present about 100 countries in the world and 40% population are considered malarious, almost half of which are in Africa, south of Sahara. More than 2400 million of the world's population is still at risk. The incidence of malaria worldwide is estimated to be 300–500 million clinical cases each year, with about 90% of these cases occurring in Africa, south of Sahara-mostly caused by *Plasmodium falciparum* [3]. Approximately 1.1-2.7 million people die every year due to malaria globally [4]. Malaria remains uncontrolled due to emergence of the drug resistant parasite, insecticide resistant mosquito and non-availability of suitable and effective malaria vaccine. The disease burden is increasing in almost all the tropical countries since malaria creates socioeconomic problems and also leads to large number of deaths, particularly among young children and pregnant mothers[5]. Malaria is still the most important cause of morbidity and mortality in India with approximately 2 to 3 million new cases arising every year [6] Malaria alone kills nearly three million people annually, including one child in every 30 sec [7] . Epidemiological scenario of malaria differs statewide and regionally and the data of a country cannot represent the situation in different regions. Knowledge about the dynamics of malaria require in a particular region so that prevention and management strategies can be planned in a better way. If we look at the epidemiological trends of India there is a trend towards increasing proportion of *Plasmodium falciparum* cases [8]. Mosquito infection rate, together with concurrent human-landing density data provide vulnerable parameters for estimating the intensity of transmission and entomological inoculation rates that serve as a relative measure of disease

risk among exposed human populations [9]. Like Malaria, Dengue infection is also a major public health problem, affecting children worldwide particularly in the Southeast Asia region. Up to 2 to 3 epidemics of dengue per year have been reported [10]. Chikungunya is also highly infectious and cases explode in geometric proportions. Since December 2005, Chikungunya emerged in epidemic proportions in India and a total of 1.39 million suspected cases have been reported. As many as 213 districts in 15 states were affected [11]. Dengue is endemic in south-east Asia, the Pacific, East and West Africa, the Caribbean and the Americas. Dengue fever (DF) and dengue hemorrhagic fever (DHF) are emerging major public health problems in India and are reported from more than 19 states [12,13]. The mosquito-borne diseases result in avoidable ill-health and death which also has been emphasized in National Health Policy [14] and Millennium Development Goals (MDGs) [15]. National Vector Borne Disease Control Programme (NVBDCP) [16] under the aegis of National Rural Health Mission (NRHM) [17] is one of the most comprehensive and multifaceted public health activities in India including prevention and control of mosquito-borne diseases.

Ahmedabad is rapidly developing and main industrial city of Gujarat, India. It is situated between North and Central Gujarat. Ahmedabad is on the bank of *Sabarmati* River and *Narmada* river canal passes through it. Unplanned urbanization and development is going on throughout the city. Because of this, there are heavy slum areas in the city. City is divided in 6 zones according to its area. Our 3 study zones cater migrant people and slum too. Most of the time atmosphere here is hot and humid, favorable for mosquito breeding. Ahmedabad is endemic for urban malaria and also for dengue fever. Though entomological indices are borderline in the city, cases and epidemics of vector borne diseases occur frequently. In Ahmedabad, average MBER, SFR and SPR were 7.6%, 0.2% and 0.05% accordingly in 2010 [18]. In Gujarat, malaria and falciparum cases were 45821 and 8474 accordingly ion 2009 [18].In 2010, dengue cases in Gujarat and Ahmedabad were 751 and 191 accordingly [18]. In Gujarat Chikungunya suspected cases were 118846 in 2006 at the time of epidemic and 637 in 2010 [18]. This was the trend of vector borne diseases in Gujarat state and Ahmedabad city. Present study suggests a rapid assessment of morbidity and mortality due to vector borne diseases, surveillance and preventive vector control measures, IEC activities, etc. In East, Central and North zones of Ahmedabad Municipal Corporation area.

Community Medicine Department of B. J. Medical College, Ahmedabad was assigned the work of rapid assessment of 3 zones. Rest 3 zones were assessed by Community Medicine Department, Municipal Medical College, Ahmedabad. Study period was 27th September to 1st of October, 2010. Each zone was assessed by 3 teams. Each team had one assistant professor, one senior postgraduate student, one junior postgraduate student and one Medical Social Worker from Community Medicine Department. In each team, assistant professor was a team leader. All the teams were guided, coordinated and supervised by professor from the Department. A pre tested Performa was designed for rapid survey of vector borne diseases and was explained in detail to the survey team members. Logistic arrangements were done by Ahmedabad Municipal Corporation. East, Central and North zones are divided into 9, 9 and 10 wards respectively. In active surveillance, house to house survey was carried out in all the wards of 3 assigned zones (100 houses in each ward) for fever cases, deaths and breeding places of mosquito. In passive surveillance, data was collected from Urban Health Centre, Private clinics, and trust hospitals in the wards. In laboratory surveillance, reports of blood smear examination were collected from different laboratories in the wards. In vector surveillance, the basic sampling unit was house or premise, which was systematically searched for water-hold containers. Additional 8 staff members of Ahmedabad Municipal Corporation with Assistant Entomologist, accompanied in the respective wards for intra domestic survey of mosquito breeding. Epidemiological interpretation of various entomological indices

like House Index, Container Index and Breteau Index were done by WHO norms.

Table 1 shows the zone wise active surveillance report. Total 2800 houses were surveyed and 14077 family members from three zones were contacted. Mosquito breeding was present in 11, 18 and 14 houses respectively in East, Central and North zone. Total 5841 containers were checked ion three zones. Total current fever cases were 257 in three zones. Attack rate of fever was 1.9%, 2.16% and 1.44% accordingly in three zones. Chlorination was satisfactory in all the zones. Intra domestic fogging was 28.44%, 24.66% and 17.7% accordingly in three zones. 6%, 3.88% and 1.8% people were using ITNs. Repellent use was 29%, 41.55% and 0.8% accordingly in three zones. House index was 1.22%, 1.55% and 1.4%; Container index was 0.46%, 0.9% and 0.8%; Breteau index was 1%, 1.78% and 1.4% accordingly in three zones. In all the wards number of positive containers having mosquito breeding were found to be less than 1%. No suspected cases of Chikungunya were found in any of these three zones and no deaths due to VBDs were reported during survey in these zones. Breteau index <5 indicates low potential of VBDs transmission.

Our study was carried out in post monsoon season and we found during rapid assessment survey, entomological indices were well controlled and in correlation with the fever cases in different areas of different zones and VBDs were also under control, despite adverse weather conditions. In all the Wards of East Zone, Number of positive containers having mosquito breeding was found to be less than 1%. High Number of positive containers was found in Raikhad (3.48%) and Girdharnagar (3.2%) wards of Central Zone. Highest (3.2%) positive containers were found in Naroda ward of North Zone.

It is recommended that all preventive and control activities of NVBDCP i.e., Intra domestic fogging, intensive anti larval measures, establishment of mobile medical teams in high risk areas, removal of waste from dirty areas should be continued strictly, IEC activities should be strengthened.

Table 1: Active Surveillance Report of Vector Borne Diseases in Three Zones of AMC

Variables	East Zone	Central Zone	North Zone	Total & Average
Total Houses Surveyed	900	900	1000	2800
Total Family Members contacted	4421	4663	4993	14077
Breeding Present in Houses surveyed	11	18	14	43
Total containers checked	2440	1440	1961	5841
No of containers +ve for breeding	11	18	14	43
Current fever Cases	84	101	72	257
Attack rate of Fever (%)	1.90%	2.16%	1.44%	1.83%
Current fever with joint pain cases	5	40	35	80
Attack rate of fever and joint pain (%)	0.11%	0.85%	0.7%	0.55%
Admitted in hospitals	8	12	3	23
Chlorination	Yes	Yes	Yes	Yes
Intra domestic fogging (%)	28.44%	24.66%	17.7%	23.6%
Net used (%)	6%	3.88%	1.8%	3.89%
Repellent used (%)	29%	41.55%	0.8%	23.78%
House Index (HI)	1.22%	1.55%	1.4%	1.39%
Container index (CI)	0.46%	0.90%	0.82%	0.73%
Breteau Index (BI)	1%	1.78%	1.4%	1.39%

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