



Incidence of dengue and shifting trend to rural in Kolhapur District, India

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ABSTRACT : Kolhapur is situated southwest corner of Maharashtra. The district is abundant in natural resources, water soil, natural vegetation, animal wealth and minerals. Kolhapur is one of the most agriculturally advanced districts of not only Maharashtra but also India. Dengue is serious life threatening health problem of developing countries. In Kolhapur districts the highest cases were found in year 2003 (47) and lowest in 2006 (2). The trend of incidence of dengue is shifting from urban to rural areas due to large scale development activities, rapid transportation, industrialization, urbanization, changing life style of human being, lack of adequate water supply and electric supply resulting into traditional water storage practices in community, failure in dry day once in week, refusal for emptying the containers, no proper cleaning of cement containers, no protection to storage water, refusal to temphos application and less social involvement in health education. The above conditions favored proliferation of *Aedes* mosquitoes and ultimately shifting the incidence of dengue to rural area.

Keywords : Dengue, Incidence, Urban to rural, Kolhapur, India

INTRODUCTION

Malaria is the main reason for fever. Now a day after malaria, dengue fever has become important cause of fever outbreaks. Dengue fever (DF) associated with dengue hemorrhagic fever (DHF) is an emerging public health problem in many countries of Asia and South America. As per the recent WHO estimates, dengue is emerging at the rate of 50 million new infections per year in almost 100 disease endemic countries of the world including India.

Earlier, the disease was mainly restricted to urban and semi-urban areas of the country because of the availability of favorable breeding sites of the mosquito vector species, *Aedes aegypti*, and rural areas were reported to be largely free of the vector species. However, over the years, the vector species has made inroads into rural areas of the country due to the introduction of safe drinking water supply schemes, which have resulted in water storage practices. This has led to the establishment and proliferation of *Aedes aegypti* mosquito. These developments have resulted in frequent outbreaks of dengue/DHF in rural areas of the country as well in addition to naturally saturating fresh water bodies in the region.

In Kolhapur previously dengue outbreaks were normally confined to urban areas. Presently, sporadic cases are

reported from urban areas and all the epidemics are reported from rural areas.

Thus, a systematic study of dengue fever outbreaks for accurate information was thought to be necessary. Further, study in local context would be more relevant in local application of the knowledge and utilization of this knowledge in developing strategies for controlling dengue in rural areas of the state by the field officers.

MATERIAL AND METHODS

During the investigation of all the epidemics house-to-house survey was carried out, for determining the extent of epidemic. The peripheral blood smears were collected and examined for presence of malarial parasites. Search for breeding of *Aedes aegypti* was carried out with the help of trained personnel. Prediction of outbreak as dengue fever outbreak was tried in this study with the help of two indicators, evidence of aedes breeding and presence of malarial parasite in PBS of fever patients. Blood samples were collected from patients in acute phase, by venupuncture. The sera samples were immediately sent to National Institute of Virology, Pune in a vaccine carrier maintaining temperature around 4° C. Simultaneously survey and identification of mosquitoes for detecting the relationship with the disease have also been made.

RESULTS AND DISCUSSION

Table 1 : Distribution of Dengue cases of Kolhapur district from 2003 to 2008.

Year	Dengue Cases		
	Urban	Rural	Total
2003	33	14	47
2004	3	10	19
2005	1	2	3
2006	2	0	2
2007	2	4	6
2008	1	14	15

In Kolhapur the highest cases were found in year 2003(47) and lowest in 2006(2). The highest cases were found in urban area were in year 2003 (33) and lowest in year 2005(1). The highest cases in rural area were in year 2003 and 2008 (14) each.

The global prevalence of dengue has grown dramatically in recent decades. Dengue fever and DHF/dengue shock syndrome (DSS) occur in over 100 countries and territories and threaten the health of more than 2.5 billion people in urban, peri-urban and rural areas of the tropics and subtropics. Dengue fever and dengue haemorrhagic fever are becoming increasingly important public health problems in the tropics and sub-tropics. Exacerbated by urbanization, increasing population movement, and lifestyles that contribute to the proliferation of man-made larval habitats of the mosquito vector, the worsening epidemiological trends appear likely to continue. The urbanization of rural area leads to shifting of the disease urban to rural.

The inhabitants of this region have habits of storing water in large number of containers ranging from clay pots, cement tanks, plastic containers, underground water storage, etc. especially during the summer season. Majority of these containers are ad-hoc reservoirs owing to the low economic status of the families. It is observed that tap water is the commonest supply of water among affected villages followed by well water, hand pump/bore well and tanker. However, as the supply of tap water is very erratic, irregular and is provided for an extremely short period of 30-40 minutes a day with no fixed timings and depending on irregular electric supply, the villagers have resorted to storing the tap water in earthen pots, cement tanks, plastic containers, drums, etc., with a capacity of 10 to 2000 litres. As there is no guarantee that when the water will be available next time, water containers are never emptied. The large water containers were found to be the main source of *Ae. aegypti* breeding as these containers were never emptied completely and the water was replenished periodically as and when piped water supply was restored.

Transovarial transmission of dengue virus by available

vector species in a dengue endemic setting could be the key etiological phenomenon responsible for re-emergence of the disease from inter-epidemic to epidemic phase of disease onset. Thus monitoring natural infectivity of mosquitoes carried through vertical route of virus and observed in cement containers may serve as an important surveillance tool for risk prediction as well as for the prevention of dengue emergence in an endemic setting.

According to census 2001, Kolhapur have urban rural population ratio 30: 70 and Human development Index (HDI) was 0.64, ranked 8th in Maharashtra. This indicates that life style of the people of the district have been changed and due to sparse housing pattern as compared to their urban settings, rural areas did not appear to differ in their behavior in Kolhapur district.

Conclusions and Recommendations :

- It is extremely important to conduct entomological and epidemiological study of fever outbreak village.
- It was observed during study that, fever epidemics are reported late. The gap between occurrence of epidemic and receipt of information to medical officer of PHC is unacceptable. Considering that health worker is not posted in each village, the response gap can only be minimized by educating the Gram Panchayat about their constitutional responsibility of reporting any event in the village.
- Villages of more than 1,000 population with tap water supply and scarcity villages are at highest risk of getting Dengue Fever outbreaks.
- Torch and entomological register should be part n parcel of health worker.
- The cleaning and brushing of the cement container should not be 100 percent, so enumerate all the cement containers in every village and kept under regular observation. This container plays an important role in transovarian transmission and egg biology of *Aedes* eggs. In this containers anti larval spraying should be done after every 15 days.
- Reported entomological indices should be communicated correctly to Grampanchayat, Medical Officer and higher authority.
- The ability of national programmes to respond to epidemics in a timely manner should be examined with a view to improving indicators and surveillance systems to ensure that the information is relevant and available for decision-making purposes.
- There is need for continued development of simple, affordable and rapid diagnostic tests and of simple standardized methods for characterizing dengue strains.
- The efficacy and effectiveness of existing personal

protection and household mosquito control measures should be studied and new vector control tools developed for both routine and emergency contexts, e.g., insecticide-treated curtains, domestic aerosols, mosquito coils and vaporizers.

- All the medical and paramedical staff should be reoriented regarding the investigation of fever outbreaks, basic entomology and keeping DF/DHF/DSS in mind during the investigation of outbreak.
- The spread of dengue to rural areas should be a matter of great concern to public health authorities, and there is an urgent need to create awareness among the rural population about the penetration of the disease into their areas. They should be imparted necessary education about the threat and their cooperation should be elicited in the early detection and elimination of *Ae. aegypti* breeding by undertaking source reduction, environmental management and personal protection measures.

- Health education of community in these villages regarding emptying, brushing and drying of water containers once a week should be started on priority. Youth club, school children and Female saving clubs plays an important role in identifying the larval breeding and conducting the dry day.
- A systematic approach should be used to improve the reach and sustainability of dengue control programmes, involving the donors, the public sector, non-governmental organizations and the private and commercial sectors.

The strategy for Dengue prevention and control :

- Fever Surveillance through sentinel sites in public/private hospitals.
- Strengthening of referral at CHCs/Districts
- Epidemic preparedness and response
- Entomological Surveillance
- Larval surveys



- Vector Control
- Anti larval measures
- Source reduction
- Personal protection
- Fogging during outbreaks
- Enactment and enforcement of legislations (Building and Civic Byelaws) to contain mosquitogenic conditions
- Behaviour Change Communication for scaling up community participation
- Inter-sectoral convergence
- Human Resource Development through capacity building
- Operational research
- Monitoring and supervision

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