Original Article

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Effect of Intensive Awareness Classes on Vector Density in Urban Field Practice Area of MES Medical College, Perinthalmanna

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Abstract

Background: Mosquito borne diseases like dengue, chikungunya form a major public health problem in Kerala. Entomological surveillance of aedes mosquito has been standardized on different indices like House index, Container index, Breateau index. In a survey covering 6 wards under the urban field practice area of MES Medical College 97.6% were found positive for mosquito breeding. Hence it was decided to conduct intensive awareness programmes. *Objectives:* The objective of the study was to assess the impact of intensive awareness programmes on vector density over 2014-2015. *Methodology:* An interventional study was conducted in Ward 29 under the urban field practice area of MES Medical College between May 2014 and November 2015. Baseline larval survey was conducted in 2014, once in the pre monsoon period (May) and three serial surveys were done following heavy rains in September, north east monsoon in October and post monsoon in November. 30 random houses were selected from ward 29 for each larval survey. A survey was conducted during December 2014 to identify the gaps in their knowledge and intensive awareness classes on mosquito borne diseases and control measures were conducted during the succeeding four months (January – April 2015). Larval surveys were repeated again in May, September, October and November in 2015. House Index, Container Index and Breateau Index were calculated. *Results:* All indices in the year 2014 were above the critical level and following the intensive awareness classes the indices came down but still above critical level [HI= 75, 41.5; CI= 54.34, 14.7; BI= 81,38.46]. To *conclude* the intensive awareness programmes were effective in reducing the menace.

Keywords: Vector Survey; Potential Breeding Sites; Positive Containers; House Index; Container Index; Breteau Index.

Introduction

Kerala has become a hub for vector borne diseases. Mosquito borne diseases like dengue, chikungunya and malaria form a major public health problem in Kerala. Aedes a genus of mosquito found in tropical and sub tropical zones is the major vector involved. Aedes can survive in almost any climatic conditions and breeds in artificial, clean water collections and rests outdoors. It transmits a number of major world's deadly diseases like Dengue, Filarial infection by Wuchereria bancrofti and Dirofilaria and avian parasite Plasmodium gallinaceum [1].

Entomological surveillance is used to determine the changes in density of vector and evaluate the control activities. Surveys to obtain relative measurements of the vector population over time facilitate us to take timely and appropriate decisions regarding interventions. All water containing containers with any volume of water are considered as potential breeding sites. Entomological surveillance of aedes mosquito has been standardized on different indices like Breteau index, House index

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and container index based on presence or absence of aedes larvae either in each container or each house. Breteau index >50% and House index >10% shows high risk for an outbreak of Dengue [2].

In a survey covering 6 wards under the urban field practice area of MES Medical College, 97.6% were found positive for mosquito breeding and all the entomological indices were found to be above the critical level [3]. [House Index = 97.6%; Container Index = 11.51%; Breteau Index = 77.84%]. Hence it was decided to conduct intensive awareness programmes among the households of ward 29 under the urban field practice area of MES Medical College to reduce the menace.

Objectives

1. To assess the impact of intensive awareness programmes on vector density indices over 2014-2015 among the households of ward 29 under the urban field practice area of MES Medical College.
2. To assess the knowledge, attitude and practice of randomly selected households in ward 29 under the urban field practice area of MES Medical College prior to intervention programmes.

Methodology

An interventional study was conducted in Ward 29 under the urban field practice area of MES Medical College between May 2014 and November 2015. Larval survey was conducted as it is easier and quick and dependable results can be obtained. Baseline larval surveys were conducted in 2014, once in the pre monsoon period (May) and three serial surveys were done following heavy rains in September, during north east monsoon in October and post monsoon in November. 30 houses were selected randomly (using computer generated random numbers) from 385 houses in ward 29 for each larval survey. Informed consent was obtained from the head of household. Details like number of houses surveyed, number of houses positive for larvae, number of potential containers and those positive for larvae were collected using a pre-designed survey forms by the Health Inspector of UHTC. Different indices like House Index (percentage of houses positive for larvae), Container Index (percentage of containers positive for larvae) and Breateau Index (number of positive containers per 100 houses) were calculated. All water containing containers irrespective of the volume of water in it were considered as a potential container. The percentage difference in indices over 2014-2015 was looked to assess impact.

In order to design the intervention programme, it was necessary to identify the gaps in knowledge and attitude of the people. Hence, a survey was conducted during December 2014. This survey was done among 30 randomly selected households in ward 29. Knowledge regarding various mosquito borne diseases, vectors, breeding places and control measures were assessed using a semi structured questionnaire. Self reported attitude and practice were also noted. The households selected for KAP survey would have also been different from those surveyed for calculating larval indices. But the awareness classes were arranged for all households in the ward.

Intensive awareness classes and discussions on mosquito borne diseases and control measures were conducted during the succeeding four months (January – April 2015) in the same area, by the Medical Officer and Junior Resident posted in Urban Health Training Centre (UHTC). The 385 households in ward 29 were divided into 16 groups of about 25 households, based on the geographical location. Classes were arranged for these 16 groups over 16 days ie one group per week. The people were reached through ASHA workers and Junior Public Health Nurses in their area. A house was conveniently selected and people were asked to gather there for the classes. Classes were one hour lectures using posters and charts prepared by the interns on the topic. This was followed by an interactive session to clear their queries.

Larval surveys were repeated post intervention among 30 random houses in May, September, October and November in 2015. The houses may not be the same in each larval survey. If it had been repeated in the same houses each time an element of bias would have crept in.

Results

A total of 120 houses were surveyed in both 2014 and 2015. All the premises inspected in 2014 were positive for breeding. All the indices in the year 2014 were way above the critical level and following the intensive awareness classes the indices during 2015 came down but still above critical level. HI at all 4 time points were above the critical level in 2015. BI during pre-monsoon (May) and post-monsoon (November) were below the critical level but were above the critical level during September and October 2015.

The figures given below show the vector indices calculated in 2014 and 2015. It also depicts the reduction achieved. In both figure 1 depicting trends in HI and figure 2 depicting trends in CI, a dip was noted during September 2014.

The findings of Knowledge Attitude Practice Survey among 30 randomly selected households, conducted just prior to intensive awareness programmes during the month of December 2014 have been given below. Table 1 shows the findings with regards to Knowledge assessment.

Source of Information

Television and health workers were the most common sources of information (each was reported by 9 out of 30). Seven reported they received these information from news papers and one said he/she got the information from internet. Four participants said that the information was shared by their friends/ relatives.

Attitude: 29 out of the 30 surveyed felt that mosquito control measures are necessary for the community and for maintaining their good health. Out of the 29 who had a positive attitude, 28 expressed willingness to practice these methods.

Practice: 26 out of the 30 interviewed, reported practicing some mosquito control measure. The most common method practiced was source reduction ie getting rid of artificial containers and filling/ drainage of artificial water collections.

Table 1: Knowledge assessment

Mosquito borne diseases they know	**Number (N=30)**	**Percentage**
None	7	23
Incorrect answers	6	20
One disease	11	37
Two or more diseases	6	20
Total	*30*	*100*
Knowledge regarding vectors of common mosquito borne diseases	**Number who answered correctly (N=30)**	**Percentage**
Vectors for Dengue	2	6.7
Vectors for Chikungunya	3	10.0
Vectors for Malaria	1	3.3
Vectors for Filaria	2	6.7
Knowledge regarding breeding places of these mosquitoes	**Number who answered correctly (N=30)**	**Percentage**
Anopheles	26	86.7
Aedes	1	3.3
Culex	3	10.0
Mansonia	0	**0**
Knowledge about source reduction methods for these mosquitoes	**Number who answered correctly (N=30)**	**Percentage**
Anopheles	13	43.3
Aedes	10	33.3
Culex	4	13.3
Mansonia	0	0

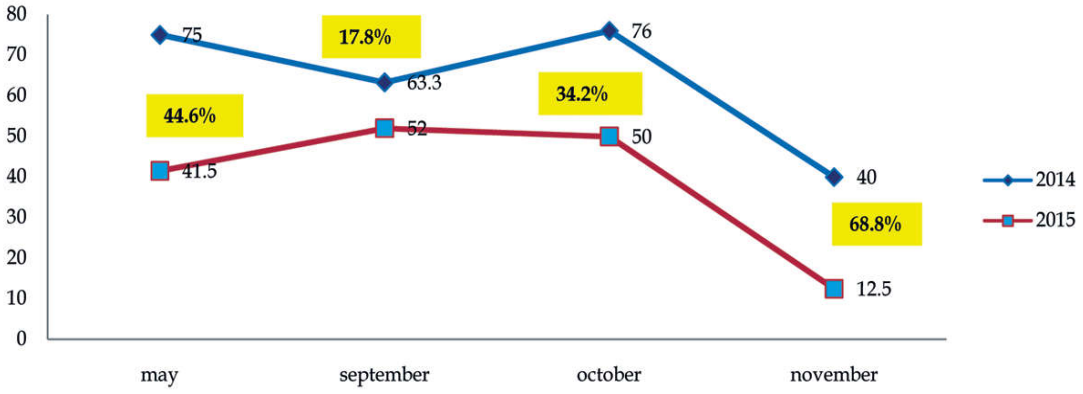

Fig. 1: Trends in house index

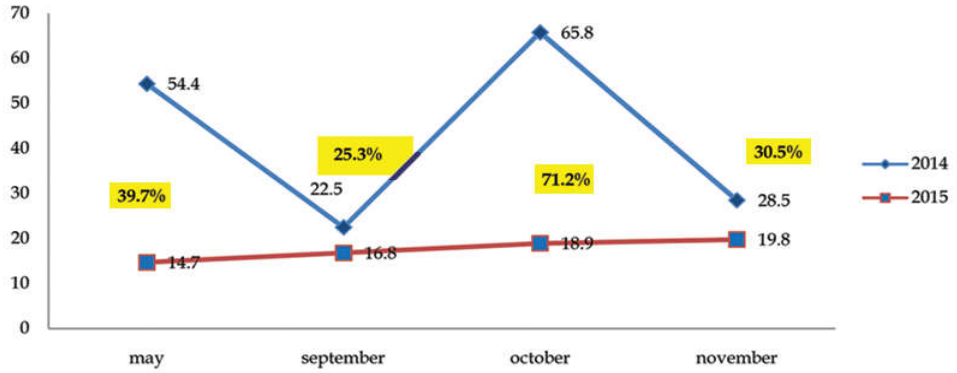

Fig. 2: Trends in container index

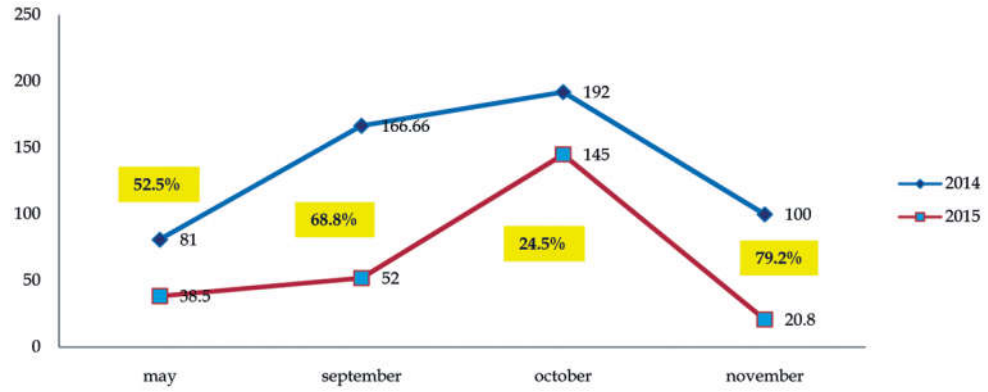

Fig. 3: Trends in breteau index

Discussion

Entomological surveillance showed high aedes vector density in urban area during all seasons in the year 2014. Our results are higher compared to survey done in Trivandrum [4] (HI-13.08, CI- 13.28, BI-16.57) and in Tamil Nadu [5] (HI 5-30; CI0.87-6.43; BI 5-30) during 2013. All indices were highest in October and least in November and this is similar to the finding in Assam study [6].

All the indices in the year 2014 were way above the critical level and following the intensive awareness classes the indices during 2015 came down but still above critical level. The reduction in HI ranged between 17.8% (September) and 68.75% (November). The reduction in CI was least in September (25.33%) and maximum in October (71.17%). BI too showed a similar range in reduction (24.47% -79.17%). A study done in Thailand in 1990 showed a 40-50% reduction in all the epidemiological indices following health education [7].

Majority knew where anopheles mosquito bred while very few knew where aedes or culex mosquito bred. In the Karnataka study, large number did not know where mosquitoes breed [8]. Very few in this study knew the vectors for dengue, chikungunya and malaria. Whereas in the Thailand KAP study, more than 90% knew diseases transmitted by aedes mosquito [9]. Nearly half knew the measures to prevent anopheles and aedes breeding in our study but according to Karnataka study, more than one third did not know any preventive measures [8]. The most common method practiced was source reduction ie getting rid of artificial containers and filling/ drainage of artificial water collections in this study. But more than 75% adopted personal protective measures in the Karnataka study [8]. In the Thailand KAP study covering water containing containers and application of abate were most commonly practiced methods [9]. The most common sources of information were health workers and television in our study similar to Thailand KAP study [health worker– 52.5%, radio- 47.7%, television- 46%] [9].

In this study, nearly all felt mosquito control was necessary and 28 (93.33%) had a positive attitude. In the Jamaica study 78% had a good attitude [10]. Poor knowledge and poor practice was noted in the Jamaica study [10]. Good knowledge was associated with low mosquito breeding in the Asian study [11]. Similarly in the Jamaica study, knowledge and attitude were shown to be predictors of practice [10].

Conclusion

Significant reduction in aedes larval indices after awareness classes shows that the the intensive awareness programmes were effective in reducing the menace and these problems can be rectified by more intensive approach.

References

1. RC Russel, CE Webb, N Davis. Aedes aegypti (L) and aedes polynesiensis marks in Moorea, French Polynesia: A study of adult population structures and pathogen, infection rates to indicate regional and seasonal epidemiological risk for Dengue and Filariasis. Journal of Medical Entomology. 2005; 42(6):1045-56.
2. India. Zoonosis Division National Institute of Communicable Diseases. Guidelines for Prevention and Control of Dengue. Delhi: Directorate General of Health Services; 2006.
3. Jesha M M, Sebastian N M, Sheela P Haveri, Mohamed Ishaac Shabeer, Manu AY. Mosquito density in urban Kerala: a study to calculate larval indices in municipal area of Perinthalmanna. Indian Journal of Forensic and Community Medicine. 2015 January-March; 2(1):7-12.
4. Vijayakumar K, Sudheesh Kumar TK, Zinia T. Nujum, Farook Umarul, Anu Kuriakose. A study on container breeding mosquitoes with special reference to Aedes (Stegomyia) aegypti and Aedes albopictus in Thiruvananthapuram district, India. J Vector Borne Dis. 2014 March; 51:27–32.
5. Mohammed Ayoub Bhat and Krishnamoorthy K. Entomological investigation and distribution of Aedes mosquitoes in Tirunelveli, Tamil Nadu, India. Int J Curr Microbiol App Sci. 2014 Nov; 3(10):253-260.
6. Witaya swaddiwudhipong, et al. Effect of health education on community participation in control of dengue hemorrhagic fever in an urban area of Thailand. Southeast Asian J Trop Med Public Health. 1992 June; 23(2).
7. Momi Das, Reji Gopalakrishnan, Dharmendra Kumar, Jyotsna Gayan, Indra Baruah, Vijay Veer & Prafulla Dutta. Spatiotemporal distribution of dengue vectors & identification of high risk zones in district Sonitpur, Assam, India. Indian J Med Res. 2014 August; 140:278-284.
8. K. Ravi Kumar, G. Gururaj. Community Perception Regarding Mosquito-borne Diseases in Karnataka State, India. Dengue Bulletin . 2005; Vol. 29.
9. Witaya Swaddiwudhipong, Ploenjai Lerdlukanavonge, Presert Khumklam, Supawan Koonchote, Patchree Nguntra And Chaveewan Chaovakiratipong. A Survey Of Knowledge, Attitude And Practice Of The Prevention Of Dengue Hemorrhagic Fever In An Urban Community Of Thailand. Southeast Asian J Trop Med Public Health. 1992 June; 23(2).
10. Wilson M. Alobuia. Knowledge, Attitude, and Practices Regarding Vector-borne Diseases in Western Jamaica. Annals of Global Health. 2015; 81(5):654–663.
11. Natarajan Arunachalam, Susilowati Tana, Fe Espino, Pattamaporn Kittayapong,Wimal Abeyewickreme, Khin Thet Wai, Brij Kishore Tyagi, Axel Kroeger, Johannes Sommerfeld & Max Petzold. Eco-bio-social determinants of dengue vector breeding: a multicountry study in urban and periurban Asia. Bull 173 World Health Organ. 2010; 88:173–184. doi:10.2471/BLT.09.067892.