

SHORT ARTICLE

Effectiveness of individual health education on the practice of dengue fever prevention in an urban area of Puducherry, IndiaSuman Saurabh¹, Veerakumar A M², Kalaiselvi S³, Palanivel C⁴^{1,2}Junior Resident, ³Senior Resident, ⁴Assistant Professor, Department of Preventive and Social Medicine, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Puducherry - 605006, India

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Abstract

Background: Prevention of breeding of Aedes mosquito is an effective method for dengue control. Practice of source reduction to prevent breeding depends on the knowledge of the community, which can be improved by health education. **Objectives:** Our objective was to ascertain the knowledge and practice of the community regarding dengue and its prevention, and to assess the effectiveness of individual health education on practice of dengue prevention. **Methodology:** In urban service area of JIPMER, using Street-wise cluster sampling pre and post intervention data collection was done. Intervention was “Individual health education on the practice of dengue prevention”. Main outcome measures were Awareness and practice regarding dengue prevention. McNemar’s test was used in the analysis. **Results:** A total of 351 respondents were studied of whom 89% knew that dengue was spread by mosquitoes. Only one-fourths knew about the correct biting time and breeding condition of Aedes mosquitoes. Practice regarding draining of unused tyres, coolers, flower vases, disposal of coconut shells and keeping unused flower pots upturned were found to improve significantly after health education. **Conclusions:** Individual health education was effective in improving the practice of source reduction in a community with poor knowledge of vector biting and breeding habits.

Key Words

Dengue; Health Education; Awareness; Practice; Source Reduction.

Introduction

Dengue is an emerging public health problem [1]. It infects 50-100 million people annually and causes around half a million cases requiring hospitalization globally [2]. This increase in dengue cases is largely attributed to population growth in the background of rapid and unplanned urbanization which has resulted in greater opportunities for vector breeding [3]. In recent years, dengue outbreaks have been reported in previously unaffected urban areas in India [4]. Puducherry reported an outbreak of dengue in 2012 with 3506 cases and 5 deaths [5].

Prevention of vector breeding through source reduction practiced by the community has been found to be effective in vector control [6]. However, the effective practice of source reduction is dependent on the awareness regarding the mode of spread of dengue and the sources of breeding [7]. Earlier studies have found that health education was effective in improving the knowledge and awareness regarding dengue [8,9].

A combination of health education with community-based environmental management has been shown

to reduce the vector breeding [8]. There is a dearth of studies in India exploring the effectiveness of individual health education in improving the practice of dengue prevention.

Aims & Objectives

To study the knowledge and practice of the community regarding dengue and its preventive measures and to assess the effectiveness of individual health education on self-reported practice of dengue prevention.

Material and Methods

Study design and setting: The study was conducted in urban service area of JIPMER, Puducherry, which was followed by individual health education. A follow-up visit was made after two weeks to assess the change in practice of source reduction for dengue prevention. The population of the study area was 9437 with around 2300 families. It has a mix of coastal fishing community with urban flats and independent dwellings towards the interior of the coastal area. Sample size was calculated as 345 households taking a prevalence of knowledge of breeding of *Aedes* mosquito as 39.1% [10] with relative precision of 20% and design effect of 2.3. Cluster sampling was done with streets as the clusters. On an average, around 20- 25 families would be residing in a street, a total of 14 streets were selected randomly from a map showing all the streets in the area. Inclusion Criteria were adults more than 18 years. One adult was selected randomly from each selected family.

Study instrument: Data collectors were trained to ensure uniform data collection. Informed consent was taken from the respondents before the interview. Awareness regarding dengue and its prevention, practice of source reduction, treatment seeking behaviour was assessed by using structured pre-tested questionnaire in local language.

Health education: Immediately after the baseline data collection, individual health education was carried out with the use of pamphlets. This pamphlet was having information regarding source reduction in the form of Photographs and Key messages. Each data collector spent ten minutes with the respondent apart from data collection and explains the content of pamphlets to them. All the doubts were clarified by data collectors to the respondent. The respondents were motivated to undertake source reduction and personal protection to protect their families from dengue fever.

The study was done in accordance with the 'Ethical Principles for Medical Research'. Verbal informed consent was taken and confidentiality of each participant was ensured.

Data analysis: Data were entered in EpiData version 3.1 and analysed in SPSS software version 20.0. Descriptive data were expressed as percentages. McNemar's test was used to compare the practice before and after health education.

Results

Demographic characteristics: A total of 351 respondents were interviewed, majority of whom were females (71.5%). There was a preponderance of age group 30-44 years among the respondents (36.2%). The literacy rate was 85.5%.

Awareness regarding dengue: Around 89% of the respondents were aware that dengue was spread by mosquitoes. However, only 24.2% of the respondents were aware of the day-time biting habit of dengue-causing mosquitoes. Only 28.8% knew specifically that dengue-causing mosquitoes breed in clean stagnant water. More than half (52%) replied that they breed in sewage, drain water or dirty water. The most commonly reported symptom of dengue was fever (73.5%). One-fourth (25.9%) of the respondents didn't know about any symptoms of dengue. Around 17% were aware regarding the need for increased intake of fluids in dengue fever. Only 2.6% were aware that intramuscular injections should not be taken in dengue and 6.8% were aware of the risk of taking painkillers in dengue without the advice of medical practitioner [Table 1].

Practice regarding dengue prevention: Only 55 families (15.7%) used any methods for protection from mosquito bites during day time. The most common methods used were liquid vaporisers followed by mosquito coils and repellent creams.

The self-reported practice of source reduction was also assessed at baseline and after two weeks of health education. We assessed practice as a proportion of eligible families. For example, only 30 families had coolers and therefore were eligible to be assessed for the practice of draining of coolers. Overall, the practice of draining the coolers and draining the unused tyres improved maximally [Table 2].

Discussion

Knowledge that dengue spreads by mosquito bites was better than that found in the two other studies done in Delhi [11,12] and in another study done in

peri-urban area of Puducherry [13]. However this was not coupled with adequate knowledge of day-time biting and clean stagnant water as the breeding place of dengue-causing mosquitoes.

We found that awareness regarding dengue treatment practices such as adequate fluid intake and avoidance of intramuscular injection was low. Intramuscular injection in dengue might lead to reduction in platelet count leading to higher incidence of complications such as bleeding [14]. Practice of certain source reduction measures was already high and consequently the improvement in practice after health education varied. Thus health education messages meant for wider coverage can be tailor-made to focus on specific prevention practices, i.e. draining of unused tyres, coolers, flower vases, disposal of coconut shells and keeping unused flower pots upturned as found in our study.

Conclusion

Our study concludes that door to door individual health education was effective in improving the self-reported practice of source reduction in a community with good knowledge of mode of transmission of dengue but low knowledge of vector biting and breeding habits. Our study adds to the growing evidence in favour of integrated vector control, wherein the fight against dengue goes beyond routine larviciding and spraying and involves close interaction with the community to prevent vector breeding.

Recommendation

Under NVBDCP multi-purpose workers from primary health care system are supposed to conduct entomological survey like house, container index and other vector indices during their field visit every fortnight. This opportunity should be utilized to inculcate and reinforce better practice on source reduction for vector control in a poor backward family and community.

Limitation of the study

Health education regarding vector control by Mass media like TV, News Paper may be the confounders; Social desirability bias on these kind of practices could not be completely avoided. Yet, since the data collectors made a follow-up visit to houses and interviewed the participants by face-to-face influence of this bias could be minimal.

Authors Contribution

SS, VAM, KS: Concept & designing of study with intellectual input, Literature search, Data acquisition, Data & Statistical analysis, Manuscript preparation, editing, review PC: Concept, Data acquisition, Data analysis, and Manuscript review.

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References

- Gubler DJ. The global emergence/resurgence of arboviral diseases as public health problems. *Arch Med Res*. 2002 Jul-Aug;33(4):330-42. Review. PubMed PMID: 12234522. [PubMed].
- WHO. Dengue Guidelines for Diagnosis, Treatment and Control- New Edition. Geneva: World Health Organization, 2009. http://whqlibdoc.who.int/publications/2009/9789241547871_eng.pdf (accessed September 5, 2013).
- Kyle JL, Harris E. Global spread and persistence of dengue. *Annu Rev Microbiol*. 2008;62:71-92. doi: 10.1146/annurev.micro.62.081307.163005. Review. PubMed PMID: 18429680. [PubMed].
- Mariappan T. Current emerging situation of dengue in India. *Trop Doct*. 2013 Jul;43(3):116-9. doi: 10.1177/0049475513491944. Epub 2013 Jun 18. PubMed PMID: 23780868. [PubMed].
- Dengue Cases and Deaths in the Country since 2007. NVBDCP, DGHS, Ministry of Health and Family Welfare, New Delhi. Available from: <http://nvbdcp.gov.in/den-cd.html> (last accessed on September 27, 2013).
- Erlanger TE, Keiser J, Utzinger J. Effect of dengue vector control interventions on entomological parameters in developing countries: a systematic review and meta-analysis. *Med Vet Entomol*. 2008 Sep;22(3):203-21. doi: 10.1111/j.1365-2915.2008.00740.x. Review. PubMed PMID: 18816269. [PubMed].
- Arunachalam N, Tana S, Espino F, Kittayapong P, Abeyewickreme W, Wai KT, Tyagi BK, Kroeger A, Sommerfeld J, Petzold M. Eco-bio-social determinants of dengue vector breeding: a multicountry study in urban and periurban Asia. *Bull World Health Organ*. 2010 Mar;88(3):173-84. doi: 10.2471/BLT.09.067892. PubMed PMID: 20428384; PubMed Central PMCID: PMC2828788. [PubMed].
- Arunachalam N, Tyagi BK, Samuel M, Krishnamoorthi R, Manavalan R, Tewari SC, Ashokkumar V, Kroeger A, Sommerfeld J, Petzold M. Community-based control of *Aedes aegypti* by adoption of eco-health methods in Chennai City, India. *Pathog Glob Health*. 2012 Dec;106(8):488-96. doi: 10.1179/2047773212Y.0000000056. PubMed PMID: 23318241; PubMed Central PMCID: PMC3541894. [PubMed].
- Castro M, Sánchez L, Pérez D, Carbonell N, Lefèvre P, Vanlerberghe V, Van der Stuyft P. A community

empowerment strategy embedded in a routine dengue vector control programme: a cluster randomised controlled trial. *Trans R Soc Trop Med Hyg.* 2012 May;106(5):315-21. doi: 10.1016/j.trstmh.2012.01.013. Epub 2012 Mar 31. PubMed PMID: 22465423. [PubMed].

10. Haldar A, Gupta UD, Majumdar KK, Laskar K, Ghosh S, Sen S. Community perception of Dengue in slum areas of metropolitan city of West Bengal. *J Commun Dis.* 2008 Sep;40(3):205-10. PubMed PMID: 19245159. [PubMed].

11. Acharya A, Goswami K, Srinath S, Goswami A. Awareness about dengue syndrome and related preventive practices amongst residents of an urban resettlement colony of south Delhi. *J Vector Borne Dis.* 2005 Sep;42(3):122-7. PubMed PMID: 16294811. [PubMed].

12. Chinnakali P, Gurnani N, Upadhyay RP, Parmar K, Suri TM, Yadav K. High Level of Awareness but Poor Practices Regarding Dengue Fever Control: A Cross-sectional Study from North India. *N Am J Med Sci.* 2012 Jun;4(6):278-82. doi: 10.4103/1947-2714.97210. PubMed PMID: 22754880; PubMed Central PMCID: PMC3385365. [PubMed].

13. Boratne AV, Jayanthi V, Datta SS, Singh Z, Senthilvel V, Joice YS. Predictors of knowledge of selected mosquito-borne diseases among adults of selected peri- urban areas of Puducherry. *J Vector Borne Dis.* 2010 Dec;47(4):249-56. PubMed PMID: 21178219. [PubMed].

14. Roesel TR. Dengue in travelers. *N Engl J Med.* 2005 Dec 8;353(23):2511-3; author reply 2511-3. PubMed PMID: 16353301. [PubMed].

Tables

TABLE 1 DISTRIBUTION OF RESPONDENTS ACCORDING TO THEIR KNOWLEDGE PERTAINING TO DENGUE

No.	Awareness regarding (n=351)	Frequency	Percentage
1	Spread of dengue		
	Mosquitoes	311	88.6
	Contaminated drinking water	4	1.1
	Don't know	35	10.0
2	Breeding conditions		
	Clean stagnant water	101	28.8
	Sewage or dirty water	183	52.1
	Clean running water	21	6.0
	Don't know	46	13.4
3	Time of bite		
	Day	85	24.2
	Night	70	19.9
	Evening	33	9.4
	Don't know	163	46.4
4	Awareness of symptoms (510 responses- multiple answers)		
	Fever	258	73.5
	Body or joint pain	92	26.2
	Vomiting	71	20.2
	Headache	60	17.1
	Others	30	8.5
	Don't know	91	25.9
5	Awareness of treatment practices		
	Need for increased fluid intake	61	17.4
	Avoidance of intramuscular injections	9	2.6
	Avoidance of painkillers	24	6.8

TABLE 2 IMPROVEMENT IN PRACTICE OF SOURCE REDUCTION MEASURES

No.	Practice	No. following / No. eligible (%)		% change in practice	P value
		At baseline	After 2 weeks of health education		
1	Draining unused tyres	11 / 20 (55.0)	18 / 20 (90.0)	35.0	0.023
2	Draining the coolers	18 / 30 (60.0)	26 / 30 (86.7)	26.7	0.013
3	Dispose coconut shells	34 / 43 (79.1)	41 / 43 (95.3)	16.2	0.023
4	Drain the flower vases	31 / 39 (79.5)	37 / 39 (94.9)	15.4	0.041
5	Keep the unused flower pots upturned	42 / 53 (79.2)	49 / 53 (92.5)	13.3	0.023
6	Covering water tanks	207 / 210 (98.6)	209 / 210 (99.5)	0.9	0.480
7	Dispose plastic cups	317 / 319 (99.4)	318 / 319 (99.7)	0.3	1.0
8	Cover the water pots	229 / 240 (95.4)	236 / 240 (99.6)	0.2	0.066
9	Avoid water collection in rooftops / sunshades	165 / 165 (100.0)	165 / 165 (100.0)	0.0	-