High Level of Awareness but Poor Practices Regarding Dengue Fever Control: A Cross-sectional Study from North India

Palanivel Chinnakali, Nishant Gurnani, Ravi Prakash Upadhyay, Komal Parmar, Tejas M Suri, Kapil Yadav

Department of Community Medicine, Indira Gandhi Medical College and Research Institute, Puducherry, All India Institute of Medical Sciences, Senior Program Officer, ICCIDD, Center for Community Medicine, All India Institute of Medical Sciences, New Delhi, India

Abstract

Background: Delhi, the capital of India, has suffered many outbreaks of dengue in recent past and despite the obvious magnitude of problem, very scarce evidence exists that documents the knowledge, awareness and practices of the people regarding dengue. Aim: To assess the knowledge and practices related to control of dengue fever and to assess the differences in knowledge and practices based on sex and literacy. Materials and Methods: A cross-sectional study was conducted among persons visiting a tertiary care hospital in New Delhi. A systematic sampling procedure was adopted and a pretested questionnaire was used. Results: A total of 215 individuals were interviewed. Majority of the respondents (96.3%) had heard about dengue. The important sources of information were television (54.9%) and newspaper/magazines (51.7%). Around 89% of the study participants considered dengue as “serious problem.” Nearly 86% participants were aware of the spread of dengue by mosquitoes while 73% were aware of one of the correct breeding sites of Aedes mosquito. Mosquito mats/liquidators were used by 61% of respondents, coils by 56% and repellant creams by 22%. Conclusion: The awareness regarding dengue and mosquito control measures was satisfactory to an extent. Programs should focus that this knowledge gets translated into practice.

Keywords: Awareness, Cross-sectional study, Dengue, Urban

Address for correspondence: Dr. Palanivel Chinnakali, Department of Community Medicine, Indira Gandhi Medical College and Research Institute, Puducherry, India. E-mail: palaniccm@gmail.com

Introduction

Dengue viruses, single-stranded RNA viruses of the family Flaviviridae, are the most common cause of arboviral disease in the world. Epidemic dengue fever (DF) and dengue hemorrhagic fever (DHF) have emerged as a global public health problem in recent decades. In fact, the problem has become hyper-endemic in many urban, peri-urban and rural areas, with frequent epidemics. South-East Asia is one of the regions with highest risk of DF/DHF, accounting for 52% of the global risk. Delhi has been endemic for DF/DHF and this is mainly attributed to the high influx of international tourists and also due to the presence of suitable conditions for breeding of Aedes aegypti. Rapid and unplanned urbanization is among one of the factors that is making Delhi more receptive to dengue epidemics. Poor living conditions in the low socioeconomic areas and slums not only contribute to the spread of the disease but also make it difficult to curb the vector population effectively in these areas. Major epidemics have been reported from Delhi in the years 1967, 1970, 1982, 1996, 2003 and 2006. In the outbreak that occurred in 2006, there were 10,344 cases and 162 deaths due to severe forms of dengue i.e., DHF/ dengue shock syndrome (DSS). Thus, DF and its associated forms comprise one of the neglected tropical diseases occurring regularly with periodic surges.
and resulting in a number of cases and deaths.

Knowledge, attitude and practice (KAP) studies serve as an educational diagnosis of a population. This information helps programs set communication objectives linked to increased community engagement and demand for services and develop tailored strategies appropriate for the social, cultural and political contexts of at-risk communities. This study aims to determine the knowledge and practices of individuals in relation to dengue and to assess the differences in knowledge and practices based on sex and literacy.

Materials and Methods

The study was conducted in compliance with “Ethical Principles for Medical Research Involving Human Subjects” of Helsinki Declaration. Confidentiality of each participant was ensured.

Study setting

This cross-sectional study was conducted in the hospital outpatient department (OPD) of All India Institute of Medical Sciences (AIIMS), New Delhi. AIIMS is a tertiary care hospital, which apart from providing high-quality health services to the people, also maintains a high standard of medical education and research.

Sample size and study participants

An assumption of 50% prevalence of good knowledge and attitude, an absolute precision of 7% and a non-response rate of 10% was taken for calculating the sample size. Thus, a sample size of 215 subjects was considered adequate to fulfill the objectives of our study at a 95% confidence level. Only residents of Delhi were included in the study. People who failed to respond to all questions or who left before completing the interview were excluded. All medical personnel including doctors, nurses and medical students were excluded from the study.

Sampling framework

Study participants were recruited through systematic sampling. Every third patient coming out of OPD was selected for the study and subsequently interviewed till the required sample size was achieved.

Interview schedule and data collection

Pretested semi-structured interview schedule was developed in English and then translated to local language, Hindi. Pretesting of the interview schedule was conducted in order to improve the clarity of the questions and response options. Minimal changes were made after pretesting. Questionnaire consisted of four sections. Section I covered demographic information about respondents, section II was about knowledge regarding the symptoms, spread of dengue and also knowledge about mosquitoes. Section III covered about the preventive practices related to dengue and section IV was about source of information about dengue.

The study participants were approached and a written consent for a face-to-face interview was sought. People were interviewed in the local language i.e., Hindi. Interviews were conducted by investigators in the month of July 2010, who had undergone training in interviewing techniques under professional supervision.

Statistical analysis

Data were double entered in Microsoft Excel spreadsheet and analyzed with SPSS version 13.0. The results were recorded as frequencies and 95% confidence intervals. Chi-square test was used to compare proportions. For the purpose of this study, dengue, DHF and DSS were considered as single entity and referred to as dengue.

Results

Socio-demographic characteristics

A total of 215 individuals were interviewed but only in 189 cases the interview schedule was completely filled. Table 1 summarizes the socio-demographic characteristics of study participants. A total of 148 (78.3%; 148/189) respondents were males. Mean age of participants was 33.8 years (SD ± 12.8). About 14% of the respondents were illiterate and 31% were graduates. Nearly 12% of the respondents were housewives and another 16% were students.

Knowledge about dengue and Aedes mosquito

Regarding symptoms and signs of dengue

Most of the respondents i.e., 96.3% (182/189) had heard about dengue. Around 89% of the study participants (168/189) considered dengue as “serious problem.” When asked about the symptoms of dengue, 84% (159/189) of respondents believed “fever” as a symptom of dengue and 11% (20/189) reported “rash.” Headache was considered as a symptom by 30% (57/189) of respondents and joint pain by 28%. Around 2% (4/189) respondents reported “bleeding” as a symptom of dengue.

Regarding mechanism of spread and prevention methods

Overall 86.3% (163/189) were aware of spread of dengue by mosquitoes. Nearly 8% (15/189) respondents reported dengue spreads through houseflies. When asked about the mosquito (Aedes), which spreads dengue, less than
half (43.4%; 82/189) of the respondents reported that it breeds on stagnant water and 23.8% (45/189) reported that it bites during day time. Females compared to males had a better knowledge about day-biting behavior of mosquitoes and the difference is statistically significant ($P<0.03$). Literacy level of participants is not associated with their knowledge about day-biting behavior ($P>0.05$).

Around 85% opined that wearing long-sleeved clothes will not protect from mosquito bites, with a statistically significant better knowledge in females ($P<0.001$). Regarding the breeding sites of these mosquitoes, 73% were aware of one of the breeding sites of *Aedes* (coolers, water tanks, water collections in artificial containers like tires, discarded plastic containers, flower pots, cups). But 26.5% of the respondents believed that *Aedes* mosquito breeds in sewage water in addition to the above-mentioned breeding sites. Regarding the mosquito control measures, 60% were aware of emptying the coolers and 54% knew about pouring of kerosene oil inside the coolers. Thirty-four percent of the respondents were aware of both the above-mentioned methods.

### Practices followed for prevention of dengue fever

A total of 121 respondents (64%) had coolers at their home [Table 2]. Out of them, 73% ($n=88$) reported that they checked their coolers for mosquito breeding and it does not differ across levels of literacy of participants ($P>0.05$). Also, of those who reportedly checked their coolers to look for mosquito breeding, nearly 29% ($n=26$) checked daily and 70% ($n=62$) weekly once [Table 2].

Out of 74 respondents who identified mosquito breeding in coolers, around two-fifth (39.2%) of them emptied the cooler, another one-third (33.8%) poured kerosene oil while 27% practiced the method of using kerosene first followed by emptying the cooler. Regarding personal protection against mosquito bites, mosquito mats/liquidators were used by 61% of respondents, coils were used by 56%, and repellent creams by 22%, though all of these were used during the night [Table 2].

### Source(s) of Information on Dengue

Of those participants who had heard about dengue or were aware of it, the important sources of information were television (54.9%), newspapers/magazines (51.7%) and health personnel (26.9%) [Table 3]. Radio was reported as source by 7.7% of respondents. Nearly 9% reported that they came to know about dengue because of their illness in the recent past.

### Discussion

The current study documented the knowledge and practices regarding dengue among the population of Delhi in view of the fact that this city had been hit by several dengue outbreaks in recent times. Understanding people’s perception and their practices could help in

| Table 2: Practices reportedly followed by the respondents to prevent occurrence of dengue |
|-----------------------------------|---------|
| Reported practice(s) | $n$ (%) |
| Presence of cooler at their residence ($n=189$) | 121 (64) |
| No | 68 (36) |
| Checking cooler for mosquito breeding ($n=121$) | 88 (72.8) |
| No | 33 (27.2) |
| Frequency of checking ($n=88$) | 26 (29.5) |
| Daily | 62 (70.5) |
| Weekly once | 62 (70.5) |
| Action taken against mosquito breeding ($n=74$) | 29 (39.2) |
| Emptying the cooler | 25 (33.8) |
| Pouring kerosene oil | 20 (27) |
| Both of the above | 20 (27) |
| Personal protection against mosquito bites ($n=189$)* | 116 (61.4) |
| Mosquito mats/liquidators | 106 (56.1) |
| Mosquito coils | 42 (22.2) |
| Repellent creams | 52 (27.5) |
| Bed nets | 53 (28) |

*Multiple responses possible
identifying target areas and also in formulating strategies to combat these outbreaks.

The majority of the respondents in this study had previously heard about DF. In another study from urban resettlement area of south Delhi, 90% respondents were reportedly aware of dengue, which is similar to our resettlement area of south Delhi, 90% respondents were previously heard about DF. In another study from urban

The majority of the respondents in this study had previously heard about DF. In another study from urban resettlement area of south Delhi, 90% respondents were reportedly aware of dengue, which is similar to our study.[13] In a study done in Brazil, 78% subjects knew about dengue,[14] whereas in Thailand, knowledge about dengue was 67%.[15] The possible explanation for the observed better awareness could be repeated exposure to health education messages widely available through mass media like television and newspapers. The knowledge of dengue disease symptoms was much lower, especially the dengue specific symptoms of bleeding and rash, which were mentioned by only 2% and 11% of the study participants, respectively. Also, knowledge about other important signs such as shock was insufficient. This could indicate that people are not always able to distinguish dengue infection from other diseases. This is a concern and it needs due attention because by making the community aware of the specific signs and symptoms of dengue, we can expect early health care seeking behavior for severe cases and provide prompt and timely management. Knowledge of more common symptoms or disease course also needs to be improved as the majority of the respondents equated fever with dengue.

In the present study, television was the most important source of information (54.9%). This is similar to a study from south Delhi, east Delhi and Kuala Lumpur.[13,16,17] The number of regional as well as local television channels has increased in the recent years and as a result of this, there has been a proportionate increase in the television viewership as well. This might be the reason why the study participants reported television as the major source of information on dengue. This emphasizes upon the fact that mass media like television is a very important source of information and this can be further used to disseminate more awareness regarding dengue. Although the role of newspapers was also found to be important yet this may not be a true representation due to the better level of education observed in our sample, which is inconsistent with the country’s population. Further, it was found that the role of health personnel in creating awareness in respect to DF was not satisfactory as only one-fourth (26.9%) of those who were aware, got the relevant information from health staff.

A large portion of the sample population could identify the vector as a mosquito but little was known about the species more so in the context of its breeding and feeding habits. Only around 44% participants reported that the mosquito breeds on stagnant water and nearly 24% reported that it bites during day time. Mosquito mats and coils were used by more than half of the respondents and all of them used it during night time. This highlights the existing gap in the knowledge with respect to the biting habits of Aedes mosquito. Measures aimed at preventing water stagnation, which serves as local breeding sites were one of the widely practiced techniques in use. This is in accordance with studies done in Thailand that reported a significant reduction of dengue vectors and DHF cases in areas having clean-up campaigns before and during rainy seasons.[18]

The study has its sets of limitations mainly the possibility of interviewer bias and the drawbacks of convenience sampling. The above observations may be true only for the study population and cannot be generalized to other populations. Also, patients interviewed could be expected to have better knowledge because of their multiple encounters with different health care providers or fellow patients in the waiting areas of outpatient units.

Based on the study findings, authors suggest that future campaigns should involve more aggressive health education through active involvement of health workers and community representatives as well. Mass media can also be used as a tool for community awareness. Health education programs should not only focus on providing knowledge and creating awareness but also ensure that this knowledge gets translated into practice as well.

References

1. World Health Organization. Dengue: Guidelines for diagnosis, treatment, prevention and control - New edition. Geneva: WHO; 2009.

2. Gubler DJ. Dengue and dengue hemorrhagic fever. Clin Microbiol Rev 1998;11:480–96.

3. Gibbons RV, Vaughn DW. Dengue: An escalating problem. BMJ 2002;324:1563-6.

4. Monath TP. Dengue: The risk to developed and developing countries. Proc Natl Acad Sci U S A 1994;91:2395–400.

5. DengueNet in India. Wkly Epidemiol Rec 2004;79:201-3.

6. Singh B. Dengue outbreak in 2006: Failure of public health system? Indian J Community Med 2007;32:99-100.
7. Yadava RL, Narsimham MV. Dengue/dengue hemorrhagic fever and its control in India. Dengue Newsl 1992;17:3-8.
8. Kaul SM, Sharma RS, Sharma SN, Panigrahi N, Phukan PK, Lal S. Preventing dengue/dengue hemorrhagic fever outbreaks in the National Capital Territory of Delhi— the role of entomological surveillance. J Commun Dis 1998;30:187-92.
9. Balaya S, Paul SD, D’Lima LV, Pavri KM. Investigations on an outbreak of dengue in Delhi in 1967. Indian J Med Res 1969;57:767-74.
10. Diesh P, Pattanayak S, Singha P, Arora DD, Mathur PS, Ghosh TK, et al. An outbreak of dengue fever in Delhi—1970. J Com Dis 1972;4:13-8.
11. Rao CV, Bagchi SK, Pinto BD, Ilkal MA, Bharadwaj M, Shaikh BH, et al. The 1982 epidemic of dengue fever in Delhi. Indian J Med Res 1985;82:271-5.
12. Annual Report 2004–05. New Delhi: Ministry of Health & Family Welfare (Govt. of India) 2005. p. 2, 38.
13. 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 Vect Borne Dis 2005;42:122-7.
14. Degallier N, Vilarinhos PT, deCarvalho MS, Knox MB, Caetano Jr. People’s knowledge and practice about dengue, its vectors, and control means in Brasilia (DF), Brazil: Its relevance with entomological factors. J Am Mosq Contr Assoc 2000;16:114-23.
15. Swaddiwudhipong W, Lerdlukanavonge P, Khumklam P, Koonchote S, Nguntra P, Chaovarikatipong C. 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 Pub Health 1992;23:207-11.
16. Gupta P, Kumar P, Aggarwal OP. Knowledge, attitudes and practices related to dengue in rural and slum areas of Delhi after the dengue epidemic of 1996. J Com Dis 1998;30:107-12.
17. Hairi F, Ong CH, Suhaimi A, Tsung TW, Bin Anis Ahmad MA, Sundaraj C, et al. A knowledge, attitude and practice (KAP) study on dengue among selected rural communities in the Kuala Kangsar district. Asia Pac J Pub Health 2003;15:37-43.
18. van Benthem BH, Khahtiku N, Panart K, Kessels PJ, Somboon P, Oskam L. Knowledge and use of prevention measures related to dengue in northern Thailand. Trop Med Int Health 2002;7:993-1000.

How to cite this article: 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. North Am J Med Sci 2012;4:278-82.

Source of Support: Nil. Conflict of Interest: None declared.