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Original Research Article

Dengue: awareness, preventive practices and water storage behaviour in an urban community of Delhi

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ABSTRACT

Background: Dengue, an arboviral disease transmitted by *Aedes egypti* mosquito, has become an important public health problem, with almost half the population of the world being at risk. Community awareness and involvement for vector control is an important aspect of disease prevention and control. The aims and objective was to assess awareness and preventive practices used for dengue and related water storage behaviour in an urban area of Delhi.
Methods: Observational, descriptive, cross sectional study.
Results: Awareness about dengue fever and its mode of spread is quite high but the participants are not aware about the practices that are putting their surroundings at risk of vector breeding; especially when it comes to water storage behaviour.
Conclusions: Behaviour change at individual and community level is essential for vector and hence dengue control, adoption of proper preventive practices and water storage behaviour needs to be emphasized at the community level.

Keywords: Dengue, Awareness, Preventive practices, Water storage behaviour

INTRODUCTION

Dengue is an acute viral diseases transmitted by *Aedes egypti*. The global incidence of dengue has grown dramatically in recent decades. About half of the world's population is now at risk. Cases across Americas, South East Asia and Western Pacific escalated from 1.2 million in 2008 to over 3.2 million in 2015.[1]

While India has shown a decline in cases of vector borne diseases such as malaria, cases of dengue/DHF continue to rise. Every year, during the period of July – November, there is an upsurge in the cases of dengue/DHF in Northern India; the disease having become perennial in Southern and Western parts of the country.[2] Increasing urbanization, unplanned growth of cities, mushrooming of urban slums, unsafe water storage practices have contributed to rise of dengue. *Aedes* mosquito can breed in a variety of water collections: tanks, cisterns, flower vases, discarded plastic and metal drums, tyres, coconut shells etc.

In absence of specific drug or vaccine against Dengue, the control strategy mainly focuses on control of vector mosquito and elimination of breeding sites at individual and community level. For sustainable vector control, community involvement is of paramount importance as checking every single potential breeding site is a herculean task that cannot be managed by health and municipal agencies alone. A strategic document has been prepared by the MOHFW for effective community participation and implementation of community based programmes.[2]

Since water storage and collection for human activities is related to the number of potential breeding sites, practices

for the same may also have a bearing on the disease burden. The association of water storage practices with socio-demographic and cultural factors, awareness about dengue and ecological relation with the vector has been assessed in a few studies done in Columbia but there is lack of detailed information about urban areas in India where water supply is usually intermittent and storage of water is very common.[3,4]

This study was aimed at assessing the awareness about dengue and related water storage and other preventive practices in an urban community of Delhi. The objectives of the present study were to: a) assess the awareness regarding mode of transmission, symptoms of dengue; b) to assess the preventive measures used by the community; c) to assess the water storage behaviour in the community.

METHODS

The study was an observational, descriptive, cross sectional study carried out at Old Nangal, the urban field practice area of the Department of Community Medicine, ACMS. The study period was from March-April 2017. A pretested, semi-structured questionnaire was used to collect socio-demographic data, information on awareness, knowledge on dengue, its mode of transmission, symptoms and preventive measures used by the community. It also collected information on water storage practices. Data was collected through house to house visits. The study was an applied aspect of medical education in the Department of Community Medicine and the 6th semester students posted in the department collected the data during their block 4 weeks clinical posting. The teams for data collection comprised of 3 students and faculty members from the dept. supervised these teams.

Based on the findings of a community based study conducted in the slums of North India, where the awareness was found to be 30%, the sample size worked out to be 165 with an error margin of 7%.[5]

Adults aged 18 year and above were included in the study. All those who refused to participate were excluded from the study. Informed consent was obtained from those who agreed to participate in the survey. All those participants responding correctly to the 'type of water dengue mosquito breeds' and 'time of the day dengue mosquito bites' where considered to have appropriate knowledge

Data analysis

The data was entered in Ms Excel and analysed using SPSS version 22. Descriptive analysis was carried out for computing frequencies and Chi square test was utilized for the association of socio-demographic variables with awareness levels. A P value less than 0.05 was considered statistically significant**.**

RESULTS

The total number of participants in the study was 170, of which 93 (54.7) were males and 77 (45.3) were females. More than half of participants were in the 18-35 years age group and an almost equal proportion were educated till high school and above. The monthly income of the participants ranged from 3,000 to 30,000 (Table 1).

Table 1: Sociodemographic characteristics of the participants.

Sociodemographic variables		Number (%)
Age (yrs)		
	18-35	96 (56.5)
	36-55	60 (35.3)
	56 and above	14 (8.2)
Gender		
	Male	93 (54.7)
	Female	77 (45.3)
Education status		
	Nil	20 (11.8)
	Primary	26 (15.3)
	Middle	32 (18.8)
	High school	35 (20.6)
	Intermediate	24 (14.1)
	Graduate and above	33 (19.4)
Family income (Rs/month)		
	<5000	8 (4.7)
	5000-9,999	41 (24.1)
	10000-19,999	67 (39.4)
	>20000	54 (31.8)

Almost all of the participants (98.8%) had heard about dengue and knew that it spreads by mosquito bite. Over 50% of the participants knew that dengue mosquito breeds in clean water and bites during day time; an important factor for adoption of preventive practices even though the knowledge about the actual etiological agent was very limited (7%). Regarding dengue symptoms, most had knowledge of fever (95.9%), while other symptoms such as 'joint pains' and' headache' were known to 13.5% and 11.8% participants respectively. Television (61.1%) was the major source of information on dengue cited by the participants, followed by Radio (40.6%). Only 18.2% of the participants got information on dengue through friends and relatives (Table 2).

Over 90% of the participants considered dengue to be a serious but preventable disease; more than two thirds consider themselves to at risk. A little less than a third know someone around them to have suffered from dengue in last one year (Table 3).

As for the preventive measures against mosquito bite, majority (61.2%) used mosquito nets. Other measures used were coils (25.9%), sprays (22.9), liquid vaporizers

(21.8%) and creams (17.6%). 88% of the people were using at least one of these methods but the use was not consistent enough to provide protection from mosquito-bites (Table 4).

A large majority of the households had the practice of storing water for use in daily activities like drinking (97.6%), washing and bathing (78.8%) and toilet (77.6%). The containers for drinking were kept covered and water changed at least once a week after cleaning the containers in all households. However, covering and changing water (at least once a week) for water stored for other purposes was less frequent (washing– 58.2% and 75.3% and toilet– 9% and 24.6% respectively) The overhead water storage tanks are important potential breeding sites (present in 84.7% households), for which the all the participants reported changing the water even less frequently than once a month.

Since desert coolers have been shown to be an important breeding site in urban areas; hence related preventive practices were asked specifically. Amongst those participants who were currently using desert coolers (71.4%), less than half (42.8%) were emptying and scrubbing at least once weekly (Table 5).

Education status (intermediate and above) and family income (above Rs. 10,000) were found to have a significant association with 'correct knowledge' about dengue (Table 6).

Table 2: Knowledge about dengue.

	Knowledge item	N (%)
1.	Heard about dengue	168 (98.8)
2.	Spreads by mosquito bite	168 (98.8)
3.	Is linked with water collection	48 (28.2)
4.	Caused by virus	12 (7.1)
5.	Type of water dengue mosquito breeds in	
	Clean	93 (54.7)
	Dirty	71 (41.8)
	Don't know	6 (3.5)
6.	Time of day dengue mosquito bites	
	Day	88 (51.8)
	Night	19 (11.2)
	Any-time	55 (32.4)
	Don't know	8 (4.7)
7.	Season in which dengue occurs	
	Summer	46 (27.1)
	Winter	26 (15.3)
	Rainy	80 (50.6)
	Any season	10 (5.9)
	Don't know	2 (1.2)
8.	Symptoms of dengue*	
	Fever	163 (95.9)
	Joint pain	23 (13.5)
	Headache	20 (11.8)
	Pain behind eyes	6 (3.5)
	Abdominal pain	6 (3.5)
	Weakness	3 (1.8)
	Others	13 (7.7)
	Don't know	1 (0.6)
9	Seen/heard govt. initiatives for control*	
	Spraying	29 (17.1)
	Fogging	82 (48.2)
	Domestic breeding check	8 (4.7)
10.	Source of knowledge about dengue	
	Radio	69 (40.6)
	Television	104 (61.1)
	Newspaper	28 (16.5)
	Friends/relatives	31 (18.2)
	Others	15 (8.9)

Table 3: Attitude towards dengue.

S. No.	Attitude item	Yes (%)	No (%)	Can't say (%)
1.	Do you think dengue is a serious illness? (n= 170)	164 (96.4)	4 (2.4)	2 (1.2)
2.	Do you think you or your family is at risk of getting dengue? (n=170)	116 (68.2)	34 (20)	20 (11.8)
3.	Is dengue preventable?	159 (93.5)	5 (2.9)	5 (2.9)
4.	Anyone in your family/neighborhood has suffered from dengue in last one year? (n=170)	50 (29.4)	118 (69.4)	2 (1.2)
5.	Was the person hospitalized?(n=50)	12 (24)	38 (76)	--

Table 4: Practices for protection from mosquitoes.

S. No.	Practice	N (%)
1.	Mosquito nets	104 (61.2)
2.	Mosquito spray	39 (22.9)
3.	Mosquito coil	44 (25.9)
4.	Mosquito repellant cream	30 (17.6)
5.	Mosquito liquid vaporizer	37 (21.8)
6.	Others	30 (17.6)

Table 5: Use of desert cooler and related practices.

S. No.	Practice item	Yes (%)	No (%)
1.	Using desert cooler currently (n=170)	126 (74.1)	44 (24.9)
2.	Painted before use in the current season (n=126)	103 (81.7)	23 (18.3)
3.	Straw pads changed in this season (n=126)	114 (90.4)	12 (9.6)
4.	Empty water and scrub at least once a week (n=126)	54 (42.8)	72 (57.1)
5.	Use kerosene/temephos at least once a week (n=126)	33 (26.1)	93 (73.8)

Table 6: Association of knowledge with socio-demographic factors

	Correct knowledge			
	Yes (%)	**No (%)**	**Total (%)**	**P value**
Age				
18-35	47 (49)	49 (51)	96 (100)	0.145
36-55	21 (35)	39 (65)	60 (100)	
56 and above	8 (57.1)	6 (42.9)	14 (100)	
Total	76 (44.7)	94 (55.3)	170 (100)	
Gender				
Male	43 (46.2)	50 (53.8)	93 (100)	0.659
Female	33 (42.9)	44 (57.1)	77 (100)	
Total	76 (44.7)	94 (55.3)	170 (100)	
Education Status				
Upto primary	13 (28.3)	33 (71.7)	46 (100)	0.011
Secondary	30 (44.8)	37 (55.2)	67 (100)	
Intermediate & above	33 (57.9)	24 (42.1)	57 (100)	
Total	76 (44.7)	94 (55.3)	170 (100)	
Family income				
<10,000	15 (30.6)	34 (69.4)	49 (100)	0.019
>10,000	61 (50.4)	60 (49.6)	121 (100)	
Total	76 (44.7)	94 (55.3)	170 (100)	

DISCUSSION

In the present study, almost all the participants had heard about dengue (98.8%). Similarly, another study from Delhi has shown a high awareness of dengue (90%).[6] However, the knowledge about vector characteristics, such as breeding in clean water and biting time were much more (54.7% and 51.8%) was much more as

compared to a study done in rural and slum areas of Chandigarh (2.6% and 4%). This could be due to better educational and income levels of participants in the current study.

Fever was the most common symptom known to the participants (95.9%). This finding is consistent with other studies reported from India, Pakistan, Malaysia and Brazil.[6-9] The knowledge for other symptoms was comparatively very less. Only 13.5% of the participants knew about joint pain and11.8% about headache; which is quite less as compared to an online study among social media users in Sri Lanka; probably hinting at the role social media can play in educating people.[10]

Television (61.1%) emerged as the major source of information on dengue in the present study. This is similar to other studies done in Delhi.[11-13] In the study from Chandigarh, health professionals were identified as a major source of information (44.87%), whereas a study from Laos, friends and relatives were major sources of information(43.9%).[7,14]

Majority of the participants in the study considered dengue to be a serious but preventable disease.Mosquito net use was the most preferred personal prophylactic measure for prevention against mosquito bite (61.4%). In contrast, a study done in Rawalpindi, Pakistan, only 12% were using mosquito net.[15] However, the use of other prophylactic measures such as sprays, coils, repellants and vaporisers was quite less; which may lead to inadequate protection from bites by *Aedes* as nets are generally used at night.

The water storage behaviour in the community puts them at risk for mosquito breeding as only drinking water is storage practices are satisfactory; for other purposes, especially for the water stored in overhead tanks, careless practices are rampant.

Level of education was found to have significant association with appropriate knowledge on dengue, with participants having higher levels of education showed better knowledge of dengue (p=0.011). Another socio-demographic factor found to be significantly associated with knowledge was income. (p=0.019). This is in line with a study done in Karachi, Pakistan, where people with higher knowledge and income had significantly better knowledge.[16] Hence the efforts to increase awareness and behaviour change should focus on areas with low literacy and income levels.

CONCLUSION

Mass media have played an important role in increasing awareness about dengue fever but there is not enough being done by individuals and communities for vector control even in cities like Delhi, where dengue has become a public health challenge every year. Domestic breeding checks may be able to tackle the problem to a limited extent; for sustainable results behaviour change has to be brought about by involving community level workers like ASHA and AWWs. Also more motivational efforts for consistent and timely use of personal prophylactic measures, by increasing awareness about vector characteristics, needs to be done.

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