Knowledge attitude and practice on dengue among households in rural areas [North Dharmapur, Gaibandha Bangladesh]

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Abstract

Dengue is the most common and essential viral arthropod-borne (arboviral) infection in humans. Throughout recent decades, the dengue rate has increased significantly. So far this year, the number of dengue-recognized patients across Bangladesh is almost double than the total diagnosed with mosquito-borne disease reported over the past 19 years. Dengue increase in rural Bangladesh stirs concerns about the cycle of outbreaks. A cross-sectional community-based survey was conducted from September to October 2019 among 100 individuals belonging to the selected village in rural Gaibandha. A formal questionnaire was used to compile data on awareness, behavior, source of information, and dengue training. Adequacy of information and behavior with a confidence interval of 95 percent was summarized as a proportion. A sample of 100 people (males 42 and females 58) were interviewed at the mean age of 35.3 years. 23% were illiterate, while 32% were university graduates. 65% of respondents knew mosquito as their vector, 89% identified clear stagnant water as their dumping ground. Fever was identified as a symptom by 100%. 37% felt dengue fever may not be cured and 76%-felt dengue fever arises during the rainy seasons. 93 % had a positive attitude towards consulting a doctor for the disease. The bulk of the data was through television, social networking sites supplemented by radio and magazines, and only 3% was through health workers. The current study observed that awareness of dengue and mosquito control measures was satisfactory to a significant extent. As a consequence, large-scale information, education and communication campaigns are needed at frequent intervals for the rural population.

Keywords: *Dengue, Practice, Knowledge, Consciousness, Rural People*

Introduction

Dengue is a very devastating disease across all arthropod-borne viral diseases. In 1945, it was first detected in India [1]. It is a chronic fever disease caused by mosquito-borne dengue viruses occurring in four specific serotypes, particularly regarding DEN-1, DEN-2, DEN-3 and DEN-4. All four DENV serotypes have commenced from syllabic strains in the forest areas of South East Asia. DENV is currently the most common cause of arboviral infection worldwide, and all four DENV serotypes can be figured worldwide [2]. The dengue incidence has risen 30 times in the last 50 years. There are now believed to be up to 50-100 million infections per year in over 100 endemic countries that pose a danger to approximately half of the world's people [3]. Around 2 billion people - two-fifths of the world's population- are already at risk of dengue, according to the World Health Organization (WHO). It would be estimated that 50 million dengue infections are readily observable worldwide each year [4]. It is now in the Asian and European countries, which has been a leading cause of children and young adults in these territories ' hospitalization and death [5]. A current (2013) estimate shows that 390 million dengue infections actually happen every year (95 per cent of credible interval 284–528 million), of which 96 million (67–136 million) arise clinically (with any disease severity) [6]. The (2012) analysis on dengue prevalence states that in 128 countries, 3.9 billion people are in danger of dengue virus infection [7]. The risk of dengue has increased in recent years due to massive urban growth and bad water management, including improper desalination habits in urban, peri-urban and rural areas, turn leads to the spread of mosquito breeding sites [1,8]. Another study reveals that DF / DHF was also one of the major circulating infectious diseases at the turn of the 21st century[9].

Dengue is a stunned viral disease contracted by mosquitoes. The periodic outbreak of both developed countries and developing countries has been documented since its first recognition in the latter quarter of the 18th century, with Asia still remaining the highest resistant region [10]. Dengue was labeled to be self-limited non-fatal febrile illness with sometimes-hemorrhagic occurrences until the middle of the 20th century, which infrequently resulted in serious or fatal outcomes. In 1956, epidemic dengue with significant hemorrhagic symptoms was recorded for the first time in the Philippines [11], since dengue-hemorrhea epidemics occurred on a regular basis in other Southeast Asian regions and dengue shock syndrome was then coined to classify cases of dengue associated with increased vascular permeability leading to complications like intestinal circumstances.

The condition of dengue in Bangladesh is worsening in this year (2019) with more than doubling the amount of infected persons comparison with the last year [12]. Dhaka, Bangladesh, states that 16223 people were diagnosed with dengue in July, 2109 more have been infected and 18 of them died from dengue in the subsequent sixth of August. A maximum of 10148 people afflicted and 26 were died dengue last year 2018 [12]. The present incidence of dengue fever out-breaks and there is a need for documented proof on the KAPs of populations on the infection and its prevention. Therefore, the present study aimed at describing the KAPs of local urban communities in North Dharmapur village towards dengue fever.

Methods

Study design and settings:

In rural Gaibandha, North Dharmapur Village, Sundarganj, Upazilla 13 no. shreepur District, the community-based, cross-sectional KAP study was conducted between September and October 2018. Sundarganj is located on 25 ° 24′ northern and 89 ° 24′ 89 ° 43′ east longitude at ageographical co-ordinate of 25° 39′ North latitude [13].

The study was approved by the Department for Pharmacy, the University of Allied Health Sciences, Dhaka, Bangladesh. Participation was voluntary and informed consent from the participants was obtained following clarification of study goals.

Sample size and sampling strategy:

According to the latest census, Sreepur Union area is 7742 acre. Total population of Sreepur Union – (Male- 17333 & Female- 17292), Literacy Rate – 27.15 [13].

The total number of households in the rural area North Dharmapur is 1900 households. The present study targeted 100 households in North Dharmapur village, Sundarganj Upazilla, Gaibandha District.

The sample size was calculated using the following parameters: population size of 100 households, 5 percent confidence limits and 95 percent confidence level using Epi InfoTM version 7.1.3 (Centers for Disease Control, Atlanta, USA). The estimated outcome rate was 50% because several possible variables were covered by the analysis. The minimum calculated sample size was 100 households, therefore. Households were randomly selected and after receiving their informed consent, household heads were invited to participate in a survey. If the household head was not present than try to collect data from most elderly person present in the house. The questionnaire used in this study was the improved version of the questionnaire validated by Mohammad Nasir et al. [14]. A pilot study (n = 100) was done to ensure the questionnaire carried effective, efficient, reliable, and valid data. The questionnaire was in the Bangla language, the national language of Bangladesh.

A few sections were included in the questionnaire; demographic information and respondent attributes, awareness and attitude. It included 19 Knowledge items and 15 Attitude items. The class of knowledge had the answer Yes / No / Not sure, and Attitude had the answer Agree / Disagree. Mark 1 was given a right and positive response, while no mark was given to the incorrect and negative response. For each category, total marks of correct answers were calculated.

Data were gathered through face-to-face interviews using a structured questionnaire. Before conducting the survey, interviewers were trained to ensure that the surveyors had a good understanding of the questionnaires, avoiding the difference in the definitions and interpretations of the concepts used. The questionnaire included closed-ended questions on socio-demographic data, symptom awareness, dengue fever transmission and vector, respondents ' attitudes to dengue fever and practices.

Data analysis:

Data was entered in the Microsoft Excel sheet and evaluated using the Social Science (SPSS) version 21.0 statistical software package. Each problem has been studied separately. The findings are shown with the different factors in proportions and percentage and relation of the behavior and practices of information.

Limitation of the study:

There was some limitations in the study, because of it cross-sectional nature, it could only generate associations but not ascertain any causal relationships between variables. However, this design and data collection tools was used is mostly appropriate for collecting data on people's KAP. Secondly, as fewer people were studied and collection of qualitative data is generally more time consuming; therefore unless time, staff and budget allow, it is generally necessary including a smaller sample size.

Results

The study's socio-demographic characteristics:
The distribution of the respondent according to socio-demographic characteristics of the respondents,is shown in Table 2. a total of 100 people took part in the survey. Many belong to the 18-50 age group. There were very few < 18 & > 50. Male and female were 42% and 58% respectively. All of them belong to different occupations. No one lives in a house that is leased. Also was at different stages of their education, 23 % of the participants were illiterate.

Knowledge of dengue fever by the respondents:
Table 3 summarizes the correct knowledge of dengue fever signs and symptoms of household heads, their transmission, and the practices that may contribute to the spread of their vector mosquitoes. Most of the 100 respondents correctly interpreted fever (100%), headache (94%) and joint

pain (97%) as major signs and symptoms of dengue fever. Moreover, as signs and symptoms of dengue fever, more than 90 percent of respondents correctly identified eye pain, muscle pain and bleeding.

65 % of respondents understood that the Aedes mosquito is the vector transmitting dengue fever with respect to the accepted mode of dengue transmission. More than 75 % had sufficient knowledge of the spread of Dengue and of dengue fever. Here it is highly noted that most respondents do not know that there is no cure for dengue fever. Just 23 % answered this question correctly.

The respondent's attitude towards dengue fever:

The attitudes of respondent households towards dengue fever are shown in Table 04. Most of the respondent's positive attitude about the severity, diagnosis, and avoidance of dengue fever. Because of this year's troubling dengue fever situation, the entire 100 respondent were scared of being diagnosed with dengue. 92% were involved to disagree that dengue can not be treated. All 100 respondents admit that everyone has the likelihood of being infected with dengue. Higher positive attitude levels of 43% and 37% were not in hospital visiting dengue patient and can be protected from infection, respectively. 75% of them think it's important to fight the spread of dengue.

Good practice of responding household heads towards dengue fever:

Table 05 summarizes good preventive practices against dengue-transmitting mosquitoes between respondent household heads. Closing the container lid quickly after using it (92%), changing the water in your home garden container every week (83%), checking for any garbage / rubbish that can obstruct the drainage system around your home (87%), using household mosquito repellent (93%), using mosquito net to sleep (91%) was the most common good practice among 100 respondents. The use of any cream / oil / gel / bangle to avoid Aedes mosquitoes is very poor (only 9%). Almost half of respondents believe in traditional dengue-fighting medicine (52 per cent)

Source of information on dengue

Table 06 summarizes the source of information on Dengue. Among100 respondent's television is everyone's source to get information on dengue. Majority of them are involved in using social networking site and 71% of them get information on dengue from dengue. Radio (27%) and Health personnel (3%) are comparatively very poor source to get information on dengue.

Discussion

Dengue fever is the most common vector-borne viral infection in the current century [15]. It tends to be urban and pre-urban, although it occurs in rural areas [16]. With the increasing incidence of dengue outbreaks in Bangladesh in 2019, this study describes KAPs of at-risk dengue fever populations in rural districts of Gaibandha. KAP surveys are of paramount importance in determining effective evidence-based prevention and control strategies by changing poor KAPs.

To the best of our knowledge, this is the first study of Gaibandha KAPs in the Dharmapur Dengue Area. In this study, most rural community respondents were able to correctly identify fever, headache, joint pain, muscle pain, skin rash, loss of appetite and bleeding as prominent signs and symptoms of dengue fever. However, pain behind the eyes and skin rash were the least frequent symptoms correctly recognized by the respondents. This is consistent with a recent study on KAPs in rural communities, which stated that more than 90.0 per cent of respondents were aware of dengue fever symptoms [17]. Fever was the medical symptom most commonly reported by respondents, and this result is consistent with previous research from different countries [17]. Since fever may be a sign of a variety of febrile infectious diseases in Bangladesh, such as malaria, people need to be educated about some other unique symptoms that local populations are not adequately aware of, such as rash and bleeding. Awareness of these signs and symptoms that make it possible for dengue fever to be distinguished from other febrile infectious diseases, taking into account that only about two-thirds of them have been able to correctly identify dengue rash.

According to the identification of signs and symptoms of dengue fever, the respondents reported awareness of the transmission of dengue fever by Aedes mosquitoes (65 per cent). The lower level of knowledge among urban populations of Gaibandha that mosquitoes are vectors of dengue fever is comparable to that reported recently by Saied et al.[33] among the populations of Dharmapur, Gaibandha (83.4%; 671/804). At the other hand, higher levels of information have been recorded from northern Thailand (98.0%), Nepal (92.0%) and Pakistan (86.9%) [18-20]. Of the respondents claiming that Aedes mosquitoes transmit dengue fever, about two-thirds realized that these mosquitoes primarily transmit dengue fever during the day. This finding is higher than that recently reported among rural communities in Hodeidah, where about a third of the respondents perceived the daytime transmission of dengue fever [17]. In fact, malaria prevalence in the study areas could contribute to misconceptions about the transmission of dengue fever by the same vector Anopheles mosquito. Therefore, variations in appearance, biting behaviour and environment between malaria and dengue vector mosquitoes should be addressed when tailoring education campaigns to local communities to prevent and monitor dengue fever. Blood transfusion has recently been identified as a potential mode of transmission of dengue fever [21,22]; however, about three quarters of the respondents were correctly identified as a source of transmission of dengue fever.

Despite the low illiteracy rate (23 per cent) of respondents in this survey, about 39 per cent of household heads have misconceptions about modes of transmission of dengue fever, including flies, contact with infected people, consuming contaminated water or eating contaminated food. In a recent study among rural populations in the Hodeida governorate, Saied et al. [17]recorded that about 52.2% (420/804) of the study population believe that dengue can be transmitted by contact with infected people.

Although most of the respondents [65%] knew that mosquito was a vector for the disease, fewer people knew about the breeding site and the biting time of the vector. 85 % of the respondents correctly responded that there was a biting period during the day. This fact shows that methods to prevent mosquito bites, such as mosquito coils and bed nets, are usually used at night and are not very effective in preventing mosquito bites. Our study showed that most of the house holds citizens had an acceptable attitude. The preventive activities found in our research were more of a concern for personal protection than for environmental vector control. It suggests the need to educate the public about transmission and environmental factors. Similar results have been published in a study on urban communities in Yemen [23].

Human knowledge and behavior towards the environment have been reported to play a significant role in the transmission of dengue by affecting its vector [24]. In this study, the most common source of information on dengue knowledge came from the media (including television, social networking sites, previous illnesses, newspapers, radio and health personnel). This reflects the impact of public education campaigns launched by the government on the general population. Press, in particular television and social networking sites, have played a key role in creating public awareness. This was close to the study results in Kuala Lumpur [25] and Thailand [26]. On the other hand, lower percentages of respondents cited health professionals / employees as their primary sources of disease data. This means that health professionals in this field are not adequately trained for awareness-raising programmes. This may reflect the value of focusing potential educational efforts at these main sites in order to improve people's behavior and effectively turn information into action and practice.

Moreover, educational system of healthcare professionals should emphasis more towards the basics of epidemiology and prevention of infectious diseases. This will effectively improve the knowledge of physicians who can make a difference by enrolling themselves in educating the general population.

Therefore, the education system for healthcare professionals will concentrate more on the fundamentals of epidemiology and the prevention of infectious diseases. This will boost the expertise of doctors who can make a difference by enrolling themselves in the training of the general population.

Conclusions

The majority of people in rural communities of Dharmapur, Gaibandha have a clear understanding about common signs and symptoms of dengue fever. However, a considerable proportion exhibits vague perception with dengue fever. Al-Although the majority of people in rural communities of Gaibandha show positive attitudes towards the severity and possible transmittability of dengue fever, negative attitudes about their perception of risk and possible prevention of infection prevail among a small proportion of rural communities and need to be targeted by educational campaigns. It appears that a good degree of population knowledge of the signs / symptoms of dengue fever and the factors contributing to the spread and regulation of its vectors has not been translated into good practice. Large-scale awareness programs to switch vulnerable population KAPs in endemic areas should be undertaken to improve the marginal efforts to control dengue fever. It appears that a good degree of population knowledge of the signs / symptoms of dengue fever and the factors contributing to the spread and regulation of its vectors has not been translated into good practice.

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Table: 01 The research respondents ' socio-demographic characteristics (N = 100)

Age (year)	< 18	4
	18 − 30	17
	31 − 40	34
	41 − 50	37
	> 50	8
Sex	Male	42
	Female	58
Marital status	Married	89
	Unmarried	11
Religion	Muslim	91
	Hindu	9
Education	Illiterate	23
	Primary school	18
	Secondary school	27
	University	32
Occupation	Housewife	21
	Agriculture	27
	Day labor	9
	Student	14
	Service holder	13
	Unemployed	4
	Others profession	12
Housing type	Own	100
	Rented	0
Family Income	< 10000	7
	10000 − 20000	11
	20000 − 30000	22
	30000 − 40000	27
	> 40000	31
Infected by dengue before	Yes	18
	No	82

Table: 02 Knowledge of Dengue Fever by the respondents:

Sl. No.	Knowledge	Correct Answer (%)	Incorrect Answer (%)
01	Dengue is spread by *Aedes aegypti* or *Aedes albopictus*	65%	35%
02	Life cycle of Aedes mosquito is one to three weeks	43%	57%
03	Stagnant water is the main source for mosquito breeding	89%	11%
04	Dengue outbreak only happens during rainy season	76%	29%
05	Dengue epidemics start during hot weather	64%	36%
06	A person can get dengue more than once	92%	7%
07	Dengue fever is an infectious disease	77%	27%
08	Dengue fever affects all age groups	100%	0%
09	**Symptoms of dengue include:**		
	▪ High fever	100%	0%
	▪ Cough	92%	8%
	▪ Joint, muscle, bone pain	97%	3%
	▪ Pain behind eyes	91%	9%
	▪ Vomiting	100%	0%
	▪ Loss of appetite Rashes	100%	0%
	▪ Headache	94%	6%
10	*Aedes* only spread dengue virus during the day	85%	15%
11	*Aedes* reproduce in dirty water	100%	0%
12	*Aedes* reproduce in clean water found in old tires, rubbish bins, and flower pots	100%	0%
13	Dengue virus spread among humans via infected female *Aedes* bites	61%	39%
14	The only way to combat dengue is to fight *Aedes* mosquitoes	78%	22%
15	No treatment available for dengue fever	23%	77%
16	Paracetamol is very effective to fight dengue fever	78%	22%
17	Larvae killer can help in killing *Aedes* larvae	80%	20%
18	Water containers and tanks without lids should be cleaned every 7 days	92%	8%
19	Insecticides can kill adult *Aedes* mosquitoes	100%	0%

Table: 03. Attitude of Respondents' Towards Dengue Fever

Sl. No.	Knowledge	Agree N (%)	Disagree N (%)
01	Dengue fever cannot be prevented	37%	63%
02	Dengue fever cannot be treated	8%	92%
03	Only healthcare workers and volunteers are responsible for clearing *Aedes* mosquitoes breeding sites	0%	100%
04	Killing *Aedes* mosquitoes is the only way to prevent dengue	43%	57%
05	Everybody has the probability to be infected by dengue	100%	0%
06	If I have dengue symptoms, I will quickly see a doctor	93%	7%
07	I am so afraid to be infected by dengue	100%	0%
08	A person cannot get dengue twice	0%	100%
09	I will not visit dengue patient in hospital	43%	57%
10	All dengue patients have the chance to heal after infected by dengue	100%	0%
11	Killing *Aedes* mosquitoes breeding sites is wasting time and hard to do	0%	100%
12	Healthy people will never get dengue	0%	100%
13	Using mosquito net can prevent dengue	84%	16%
14	You are an important person to fight dengue spread	75%	25%

Table: 04. Practice of Respondents' Towards Dengue Vector Control.

Sl. No.	Knowledge	Yes	No
01	Do you close the container lid quickly after using it?	92%	8%
02	Does your house water tank have a lid?	78%	22%
04	Do you change the water in the container of your home garden every week?	83%	17%
05	Have you changed the water in your flower vase?	74%	26%
06	Have you checked for *Aedes* larvae in your vase?	76%	24%
05	Do you check for any garbage/rubbish that can block the drainage system around your house?	87%	13%
08	If yes, have you put the garbage into its bin to clear the drain	68%	32%
09	Do you use any mosquito repellent in your house?	93%	7%
10	Do you use mosquito net to sleep?	91%	9%
11	Have you check *Aedes* larvae in your toilet tank?	69%	31%
12	Do you check and clean your house drain and roof during the rainy season?	84%	16%
13	Do you use any cream/oil/gel/bangle to avoid *Aedes* mosquitoes?	9%	91%
14	Do you believe in traditional medicine to fight dengue?	52%	48%

Table 05. Source of information on Dengue

Sl. No.	Knowledge	Yes	No
01	Television	100%	
02	Newspapers/magazines	32%	68%
03	Health personnel	3%	97%
04	Radio	27%	73%
05	Past illness with dengue	53%	47%
06	Social Networking Site (Facebook)	71%	29%

Figure: 1. Location of the study areas Dharmapur, Gaibandha Bangladesh

Dharmapur