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Knowledge, Attitudes, and Treatment Seeking Behavior about Malaria and Its Control among Patients Attending Fever Clinic in a Tertiary Care Hospital of Eastern India

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Abstract

Background: Malaria continues to be a serious public health problem in South-East Asia including India. We assessed knowledge, attitudes, recognition of signs and symptoms and treatment seeking behavior about malaria and its control in patients with fever attending fever clinic at tertiary care hospital, Kolkata, India. ***Material and Methods:*** A cross-sectional questionnaire based survey was done in patients attending fever clinic. A total of (n = 68) patients with fever were interviewed using standardized questionnaire. ***Results:*** A total of 68 subjects were interviewed, including 19 (27.94%) females and 49 (72.06%) males. Mean age was 39.8 ± 17.2 years (18–78). About 5 (7.35%) were illiterate. All of the study participants had heard of malaria. The most common response on the source of information regarding malaria was radio (32.35%) followed by TV (29.41%) and friends (26.47%). About 52.94% replied that malaria can be prevented. Approx 39.7% subjects informed that fever plus chills are the most clinical features of malaria, followed by (fever+ chills + bodyache) in 32.35% cases. The most common response on the source of information regarding malaria transmission by mosquito bite was in 92.65% cases. Knowledge about breeding places of mosquitoes was informed as dirty stagnant water by 47.06%. ***Conclusions:*** Greater awareness about malaria and undertaking a broader range of preventive actions for malaria influence appropriate treatment-seeking behaviour. This study was conducted to understand issues, which can be an important step towards developing strategies, aimed at controlling malaria. The positive attitudes and practices in relation to personal protection and prevention measures against malaria require marked improvement.

Keywords: ***Malaria, Knowledge, Attitude, Treatment seeking, Eastern India***

Introduction

Malaria is a major public health problem in India causing an enormous burden to health and economy. In 2016, an estimated 216 million cases of malaria occurred worldwide (95% confidence interval [CI]: 196–263 million), compared with 237 million cases in 2010 (95% CI: 218–278 million) and 211 million cases in 2015 (95% CI: 192–257 million). Despite substantial reductions, between 2014 and 2016, substantial increases in case incidence occurred in the WHO Region of the Americas, and marginally in the WHO South-East Asia, Western Pacific and African regions.[1] Malaria is a public health problem in several parts of the country. About 95% population in the country resides in malaria endemic areas and 80% of malaria reported in the country is confined to areas consisting 20% of population residing in tribal, hilly, difficult and inaccessible areas.[2] In India, about 1.31 million malaria cases with 753 deaths were reported in the year 2011 out of which more than half cases were of Plasmodium falciparum.[3]; the actual number of cases may be much more than the number of confirmed cases reported by National Malaria Control Programmes.[4] Jharkhand and Bihar are malarius endemic states and under the Enhanced Malaria Control Project (EMCP) funded by the World Bank from 1997[5] and contributes about twelve percent of the total malaria cases.

Malaria is a unique disease and has roots deep within human communities. There have been a considerable number of reports about knowledge, attitudes, and practices relating to malaria and its control from different parts of South East Asia. These reports concluded that misconceptions concerning malaria still exist and that practices for the control of malaria have been unsatisfactory. Thus, an advanced knowledge of the community beliefs and practices with respect to the disease is required to obtain and maintain its participation in surveillance and control activities.[6]

Beliefs and practices of malaria are often related to culture which can influence the effectiveness of control strategies.[7] Thus, local knowledge, attitudes and practices related to the disease are key to implementation of culturally appropriate, sustainable, and effective interventions.[8] Community perception, beliefs, and attitude about malaria control, symptom identification, treatment, and prevention

influence efforts to address malaria and are often overlooked in control efforts;[9] and vary from country to country and among individual households.[10] Failure to consider community's knowledge, attitude, and practice (KAP) about malaria may contribute to the inability of the program to achieve sustainable control.[11,12] The objective was to collect baseline information concerning knowledge, attitudes, and practices of people in the study area regarding malaria among patients attending fever clinic of a tertiary care teaching hospital, Kolkata.

Materials & Methods

The study was conducted from May to October 2014 in patients attending a dedicated fever clinic in a tertiary care teaching hospital. The study was a hospital based cross-sectional study. A structured questionnaire was used for interview. The questionnaire was administered to 100 randomly selected fever patients and 68 subjects who completed the complete interview were considered for final analysis. The first part of the questionnaire included demographic characteristic, whereas the second part had questions on knowledge, attitude and practices of residents about malaria, symptoms of malaria, transmission, protection methods of malaria, malaria vectors, and mosquito breeding, resting places, refusal of DDT spray and regular use of ITNs for malaria control etc. The questionnaire was prepared in English language but translated and communicated in local languages when necessary. Full verbal explanation of the study was given to members of selected patients or accompanying person with the fever patients and consent was obtained before inclusion as participants. Privacy and confidentiality were maintained throughout the study. The data were entered into a Microsoft Excel - Worksheet and analyzed using Epi Info, version 3.5.3. Descriptive statistics were carried out to measure relative frequencies, percentages, averages, and relative frequencies of the variables. Ethical clearance to conduct this study was obtained.

Results

A total of 68 subjects were interviewed, including 19 (27.94%) females and 49 (72.06%) males (Table 1). Mean age was 39.8 ± 17.2 years (18–78). About 5 (7.35%) were illiterate. Majority of the participants 39.71 % was 16-30 yrs followed by 38.23% of 31-45 yrs. Majority of the subjects were from upper lower socioeconomic class 92.65% followed by lower middle (4.41%) and lower (2.94%). None of the participants attended the Government fever clinic belong to upper middle or upper class. Detailed socio-demographic characteristics are presented in Table 1.

Table 1: Socio- economic profile of study population

Socio-Economic Background		
Age in years	**Frequency**	**Percentage**
<15	0	0
16 -30	27	39.71
31- 45	26	38.23
46- 60	13	19.12
>60	2	2.94
Socio-economic scale (according to Kuppuswamy's socio-economic scale 2012)		
Class	**Score**	**Frequency**	**Percentage**
Upper	26-29	0	0
Upper Middle	16-25	0	0
Lower Middle	11-15	3	4.41
Upper Lower	5-10	63	92.65
Lower	<5	2	2.94

Table 2: Knowledge about malaria among study participants

Have you heard about malaria before?		
No	0	0
Yes	68	100
If yes, from where?		
Friends	18	26.47
TV	20	29.41
Community Health Worker	9	13.23
Family Members	17	25
School	0	0
Malaria Camp	0	0
Posters/Pamphlets	0	0
Religious Meeting	1	1.47
Health Camp	3	4.41
Newspapers	11	16.18
Community Meetings	2	2.94
Radio	22	32.35
Health Facility	9	13.23
Others	0	0
Not Applicable	6	8.82
Can malaria be prevented		
Yes	36	52.94
No	2	2.94
Don't Know	30	44.12
Knowledge about symptoms of malaria		
Fever+ Chills	27	39.7
Fever+ Chills + Bodyache	22	32.35
Fever + Chills + Bodyache + Headache	16	23.53
All Above Symptoms + Vomiting	2	2.94
No Comments	1	1.47
Knowledge about malaria transmission		
Mosquito Bite	63	92.65
By Flies	1	1.47
Contaminated Water	2	2.94
Chill Climate	1	1.47
Malnutrition	1	1.47
Eating Raw Vegetable	0	0
Any Other	0	0
No Comments	5	7.35
Knowledge about breeding places of mosquitoes		
Dirty Stagnant Water	32	47.06
Due To Poor Personal Hygiene	6	8.82
Flower Pots	0	0
Coolers	0	0
Air	0	0
No Idea	31	45.59
No Comments	2	2.94
Idea about what diseases are transmitted by mosquitos		
Dengue	0	0
Malaria	31	45.59
Dengue+Malaria	30	44.12

Diarrhoea	0	0
Typhoid	0	0
No Idea	3	4.41
No Comments	2	2.94
Knowledge about preventive measures of malaria		
Mosquito Nets	33	48.53
Use Of Fans	5	7.35
All The Above + Proper Clothing	7	10.29
All The Above + Avoid Water Collection	8	11.76
Check For Mosquito Breeders In Coolers	2	2.94
Check For Mosquito Breeders In Flower Pots	0	0
Last Two Options+ Check Tyres For Mosquito Breeding	0	0
No Comments	20	29.41
Any knowledge about self protection from mosquito bites?		
Mats	9	13.23
Coils	9	13.23
Bednets	47	69.12
Fans	13	19.12
Others (Fire/Smoke)	2	2.94
No Comments	12	17.65

All of the study participants had heard of malaria [Table 2]. The response to questions on knowledge with multiple options drew multiple responses. However, the most common response on the source of information regarding malaria was radio (32.35%) followed by TV (29.41%) and friends (26.47%). Very little information about malaria was originated from malaria camp, and religious meeting. About 52.94% replied that malaria can be prevented. Approx 39.7% subjects informed that fever plus chills are the most clinical features of malaria, followed by (fever+ chills + bodyache) in 32.35% cases. The most common response on the source of information regarding malaria transmission by mosquito bite was in 92.65% cases. Knowledge about breeding places of mosquitoes was informed as dirty stagnant water by 47.06%. Knowledge about preventive measures of malaria by mosquito nets was in 48.53% cases. Knowledge about self protection from mosquito bites by bed net was reported 69.12% [Table 2]. Idea about what diseases are transmitted by mosquitos was reported by 45.59% participants. About 44.12% of the subjects reported that they are aware that dengue and malaria are mosquito borne diseases. By using mosquito nets alone 48.53% reported that malaria can be prevented. About 11.76% reported by avoiding water collection in addition malaria can be prevented. Only 2.94% stressed upon "check for mosquito breeders in coolers" to avoid malaria parasite growth [Table 2]. As reported by participants self protection from mosquito bites may be done by bednets, fan, coils, and mosquito mat by 69.12%, 19.12%, 13.23% and 13.23% respectively.

Table 3: Treatment seeking behavior among study participants

	Frequency	Percentage
Duration of suffering from fever		
1 day	6	8.82
2 days	15	22.06
3 days	24	35.29
4 days/ more	23	33.82
Pattern of fever		
Fever Continuous	6	8.82
Fever Remittent	41	60.29
Fever Intermittent	19	27.94
Don't Know	2	2.94
Present complaints		
Fever	67	98.53
Chills	59	86.76
Yellow Eyes	1	1.47
Headache	59	86.76
Bodyache	56	82.35
Nausea	19	27.94
Vomiting	14	20.59
Anemia/Pale Looking	0	0
Generalized Weakness	22	32.35
Yellowish Urine	13	19.12
Loss of Appetite	39	57.35
Diarrhea	0	0
Constipation	0	0
Convulsion	0	0
Others	16	23.53
First action taken in case of fever		
Home Remedy	2	2.94
Self Medication	6	8.82
Went to a Doctor/ Hospital	37	54.41
Went to a Chemist For Medication	20	29.41
Went to Quack	1	1.47
No Response	1	1.47
Delay in seeking treatment from medical care provider after the onset of fever		
Same Day	18	26.47
Next Day	33	48.53
Day After Next	5	7.35
More Than 2 Days	12	17.65
Later	0	0
Reason for not seeking treatment for this illness		
Not Severe Enough	38	55.88
Got Better	0	0
Home Remedy	2	2.94
Tried Self Medication	10	14.7
Not Enough Money	5	7.35
Too Far Away	0	0
No Transport	0	0
Family Would Not Let Me	2	2.94
Others	17	25
Most important reason for choosing this medical care provider/ Govt hospital		
Proximity	51	75
Good Reputation	52	76.47
Inexpensive	22	32.35
Good Personal Experience	10	14.7
Qualified Staff	1	1.47
Freely Available Drugs	30	44.12
Relative/Friend Works Here	4	5.88
Can Get Treatment on Credit	0	0
Others	0	0
Distance from the care provider		
>10 km	2	2.94
5-10 km	7	10.29
1-4 km	54	79.41
<1 km	5	7.35

Mode of transport to the care provider		
Walk	51	75
Bicycle	0	0
Motorcycle	3	4.41
Private Car	0	0
Public Taxi/Bus	13	19.12
Metro/ Train	1	1.47
Auto	2	2.94
Others	1	1.47
Whom did you consult at this facility		
Doctor	66	97.06
Nurse	0	0
Pharmacist	23	33.82
Lab Technician	50	73.53
Traditional Healer	0	0
Others	0	0
Duration of admission to the facility for fever		
No. of Night Stay		
3	7	10.29
2	0	0
1	0	0
0	61	81.71
Advise to have any diagnostic test		
No advice, but test	0	0
No advice, but had test	1	1.47
Advised but declined	0	0
Advised and had test	67	98.53
Test recommended		
Rapid Diagnostic Test (RDT)	1	1.47
Microscopy	67	98.53
Both RDT and Microscopy	0	0
Any Other	0	0
Don't Know	0	0
Test Result		
Positive	68	100
Negative	0	0
Don't Know	0	0
Type of malaria infection detected in test report		
P. Falciparum	21	30.88
P. Vivax	47	69.12
P. Malariae	0	0
P. Ovale	0	0
P. Knowlesi	0	0
Mixed Infection	0	0
Don't Know	0	0
Receipt of medicine or prescription from this facility		
Received medicine	68	100
Received prescription	5	7.35
No, did not receive Medicine/Prescription	0	0
Don't know	0	0
Treatment regimen followed		
Artesunate (50mg) + Sulfadoxine (500mg) + Pyrimethamine (25mg)	13	19.12
Sulfadoxine (500mg) + Pyrimethamine (25mg)	2	2.94
Artesunate (50mg) + Sulfadoxine (500mg) + Pyrimethamine (25mg) + Primaquine Phosphate (15mg)	6	8.82
Chloroquine (250mg)	47	69.12
Proper explanation by HCP regarding when and how drug to be taken		
Yes	65	95.59
No	3	4.41
Advised by HCP for follow up		
Yes	36	52.94
No	32	47.06
Any malaria infection in recent past		
Within 1 month	2	2.94
3 month	6	8.82
6 month	3	4.41
More than 1 year	29	42.65
Don't know	28	41.18
Any anti-malarial treatment in the recent past		
Within 1 Month	2	2.94
3 Month	5	7.35
6 Month	3	4.41
More Than 1 Year	28	41.18
Don't Know	24	35.29

In more than 35.29% of the subjects with fever seeking treatment outside the home by 3 days followed by 33.82% by 4 days or more. Pattern of fever was found to be mainly remittent (60.29%), followed by intermittent (27.94%) and continuous (8.82%) [Table 3]. Chief clinical presentations were mainly fever (98.53%), chills (86.76%), headache (86.76%) and bodyache (82.35%). Loss of appetite (57.35%), nausea (27.94), vomiting (20.59%), and generalized weakness (32.35%) were less commonly reported problems in patients with fever. None of the participants had reported anemia or pale looking, diarrhea, constipation or convulsion ever experienced during current fever attack. Majority of the subjects 54.41% went to doctor whenever fever was troublesome, followed by 29.41% first went to local chemist for medication. Few cases they tried home remedy (2.94%), went to quack (1.47%) or tried self medication 8.82%. Some respondents, however, indicated that they resort to other treatment choices outside the home, when the first action at home fails.

Delay in seeking treatment from medical care provider after the onset of fever was observed next day (48.53%) followed by same day (26.47%) and more than 2 days (17.65%). Respondents had reported main reasons for not seeking treatment for fever are "not severe enough" (55.88%), 'tried self medication' 14.7%, and 'not enough money' 7.35%. about 25% respondents did mentioned other reasons for delaying treatment. Respondents reported the most important reasons for choosing this medical care provider/ Govt hospital are 'good reputation' 76.47%, 'proximity of health clinic' 75%, 'freely available drugs' 44.12% and 'inexpensive' 32.35%. On an average 1-4 km respondents had to travel for seeking treatment in 79.41%. About 10.29% cases they had travelled almost 5-10 km for seeking low cost better treatment facilities. Majority of subjects travelled to fever clinic by walk and public bus. Approximately 97.06 % cases participants had consulted doctor at fever clinic followed by lab technician 73.53% for blood reports and 33.82% cases with pharmacists. Majority of respondents 81.71% did not get admitted with fever. Only 10.29% cases subjects got admitted in the hospital with an average of 3 night stay.

About 98.53% cases blood test was advised with the history of fever patients attending fever clinic. About 98.53% microscopy of peripheral smear for malaria parasite was advised and based on report outcome treatment was served. In all most all cases in the present series were positive for malaria parasite. P. vivax was much common among present fever cases 69.12% followed by p. falciparum 30.88%. All the respondents or subjects with fever were prescribed medicine free of charges from fever clinic. Chloroquine was prescribed among 69.12% followed by 19.12% cases [Artesunate (50mg) + Sulfadoxine (500mg) + Pyrimethamine (25mg)] combination therapy. Only a few cases 2.94% [Sulfadoxine (500mg) + Pyrimethamine (25mg)] were prescribed and dispensed. About 95.59% cases health care professionals properly explained how drugs to be taken.

About 52.94 % cases advised for follow up. As reported by respondents' 42.65% cases respondents had similar fever attack more than 1 yr back. Only 2.94% cases there was history of repeated fever. About 41.18% cases took antimalarial treatment by more than one year back. About 7.35% cases they had antimalarial treatment within 3 months, which showed some had history of repeated attack of malaria infection [Table 3].

Discussion

Community knowledge, attitudes and practices relating to causation, transmission, prevention and treatment are key factors influencing malaria prevention and control. Results from surveys on knowledge, attitudes, and practices are applicable to design or improve malaria control programs, and to identify indicators for a program's effectiveness.[8] All of the study participants had heard of malaria which is same as RK Gupta et al (2016).[12]

Study by Singh R et al had shown that about 180 (90.0%) of the respondents reported any bed nets as the most common known protective method against malaria, while 128 (64.0%) respondent had knowledge of insecticide treated bed net (ITNs). Second most common known preventive measure was use of mosquito coils by 79 (37.8%) respondent. The knowledge of ways to prevent mosquito breeding, by cleaning of house surroundings was reported by 97 (48.5%) and draining of stagnant water by 58 (29.0%). Knowledge of the role of mosquitoes in malaria transmission (11.8%) and cause of malaria (9.6%) was observed to be low among the study population. Comprehensive knowledge about malaria prevention measures was high (90%), but not reflecting in their practice (16%). They have good knowledge of mosquito behavior (breeding areas (64.5%), resting places (70%) and biting time (81%)). Seeking hospital care for a febrile child was a good practice (68.5%) observed. Attitudes regarding the best antimalarial therapy was limited (56.7%) to chloroquine.[13]

Study by Vijayakumar KN et al8 showed about 63% of the respondents mentioned mosquito bite as the cause for this disease and 65% considered malaria as a serious problem. Qualitative data showed that people from remote villages seek treatment from traditional healers, Disharis. About 64% of the respondents stated that avoiding mosquito bites could prevent malaria. Majority (99%) of the people reported using personal protection measures to avoid mosquito bites.

In this study, the majority of respondents reported to have heard of the chloroquine therapy, artemether combination therapy for treatment of malaria. An encouraging finding of Singh R et al13 study revealed that only 8% of respondent mentioned traditional healer as a choice of treatment, which was consistent with previous study in Nigeria.[14] We found that almost all participants seek treatment for malaria from healthcare facilities, with more than half seeking treatment within 24 h of presenting with symptoms. Regarding the adoption of personal precautionary measures by participants in Sami Khairy et al study,[15] mosquito nets were the most commonly used protective equipment, followed by anti-mosquito sprays (47.3% and 29.8%, respectively). Greater awareness about malaria and undertaking a broader range of preventive actions for malaria influence appropriate treatment-seeking behavior. A study in Cambodia showed that early recognition of malaria symptoms is the first important step to treatment seeking[16] Study by Thandar et al.[17] revealed caregivers were aware of malaria symptoms, about 50% were unaware that children under five and pregnant mothers are especially vulnerable to malaria.

The findings clearly demonstrate that the majority of the respondents had adequate knowledge and desirable health seeking-behavior; still a sizable proportion had misconception of the cause of malaria. The correction of such misconceptions about the relationship between mosquito bite and malaria through health education messages is critical for the success of malaria prevention and control.[18] Community Knowledge on malaria prevention and control options is important and the effort is related to either to environmental management, personal protection or vector control. Study by Zewdie Aderaw et al[19] revealed that unconsciousness (28.3%), seizure/convulsion (24.4%) and vomiting (16%) were most frequently mentioned signs and symptoms of server malaria. This finding was supported by a study done in Myanmar which reported unconsciousness and convulsion are most frequently mentioned signs and symptoms of malaria.[20]

Study by Singh RK et al revealed that the awareness of malaria and its symptoms and transmission was very high (100%) among the population with higher economic group and was significantly different ($p<0.05$) from the low economic group. Similarly the perception that malaria can be prevented and is transmitted by mosquitoes was much higher than those with lower economic group ($p<0.05$).[21]

Conclusion

Greater awareness about malaria and undertaking a broader range of preventive actions for malaria influence appropriate treatment-seeking behaviour. Local knowledge and practice related to malaria is important for the implementation of culturally appropriate, sustainable and effective interventions. The findings of this study indicate that urban communities in Kolkata, West Bengal have high knowledge on malaria transmission, symptoms, and preventive measures. However, low education was detected as a major drawback for effective control, and intervention measures and information campaigns should focus on this high risk group. Increasing the knowledge about malaria transmission and benefits of using available effective preventive and control measures by the individual households and the community could contribute much to the overall reduction of the malaria burden. The obvious gap between the knowledge and practice related to malaria prevention requires innovative strategies based on local evidence that well suits the local circumstances to promote and encourage the

adoption and practice of personal protective measures. Most of the respondents had an acceptable level of knowledge and awareness about malaria, and indicated that they would seek treatment quickly if they developed symptoms.

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