



Original Article

Impact of Community based Awareness Education by Imparting Knowledge regarding Chikungunya in Rural Population of Wardha district

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Abstract

Introduction: Chikungunya is a re-emerging debilitating viral disease for which any specific cure or vaccine is not available. Efforts should be made to reduce human-mosquito contact or eliminate vector populations. The knowledge that could be gained in this investigation would help rural population to take certain preventive measures and also guide policy makers and health authorities to plan, design and initiate initiatives, programs, and policies regarding chikungunya prevention.

Aim: To assess the knowledge practiced for preventing chikungunya and measure the impact of community based education.

Setting and Design: Follow up study (cross-sectional study repeated at intervals), conducted at Rural village population near AVBRH hospital and Jawaharlal Nehru Medical College, DMIMS.

Material and Method: Seventy five participants was studied from Salod village from Wardha district, over a period of two months. After obtaining written informed consent each participants house was visited by investigator using validated questionnaire. The data was gathered. The questionnaire consisting part –A has to be filled by participants and part –B to be filled by investigator with marks allotted to each question. Awareness was imparted to the participants by oral discussion regarding chikungunya as well as pamphlet consisting of information was provided in local language to each participant. The participant was informed about next visit by the investigator after seven days in which the same questionnaire was given to check the improvement in the knowledge regarding chikungunya and sanitation improvement after those seven days.

Statistical Analysis Used: Data was analyzed using descriptive and inferential statistics. Statistical analysis was done by using descriptive and inferential statistics using chi-square test and software used in the analysis were SPSS 17.0 version and Graph Pad Prism 6.0 version and $p < 0.05$ is considered as level of significance.

Result: Positive correlation in knowledge regarding chikungunya fever was found at post test among participants and information imparted, drastic change was observed with respect to pre test taken, and questionnaire helped individuals to gain more knowledge regarding the disease and its prevention.

Conclusion: This study concludes that the knowledge score of participants regarding chikungunya fever and invigilator increases at post test. Hence a better and healthy community can be achieved just by imparting simple doorstep knowledge.

Keywords: Chikungunya, Mosquito, Prevention, Practices, Community.

Introduction

Chikungunya is a dengue-like disease which is transmitted by the Aedes, Culex and the Mansonia Mosquitoes. Chikungunya virus (CHIKV) is a member of the Alphavirus genus in the family of Togaviridae^[1] and believed to have originated in Africa about 200–300 years ago^[2]. Chikungunya derives its name from kungunyala, the Swahili word for the contorted posture of patients because of their arthritic symptoms. It was first described by Robinson and Lumsden in 1953 and was first detected in United Republic of Tanzania^[3]. *Ae.aegypti* is the principal vector for CHIKV. CHIKV is maintained in a sylvatic cycle that involves non-human primates and a number of forest-dwelling mosquitoes. CHIKV is also transmitted by *Ae. albopictus*.

First Chikungunya outbreak was reported in 1960s and became sporadic until resurgence in 2006. In India, major epidemics of chikungunya were reported in 1963 in Kolkata, in 1965 in Pondicherry, Tamil Nadu, Andhra Pradesh, Madhya Pradesh and Maharashtra and again in 1973 in Maharashtra^[4]. Thereafter, sporadic cases continued to be recorded in Maharashtra during 1983 and 2000^[5]. In January 2006, there was a very large epidemic which was followed quickly by the one in India. Resurgence of chikungunya has been attributed to various factors including globalization, increase in the mosquito population, loss of herd immunity and the mutation A226V in the E1 gene causing a significant increase in CHIKV infectivity for *Ae. Albopictus*^[6].

Chikungunya affects all age groups, mainly focused in children. Symptoms include, persisting arthralgia, neurological symptoms and non-neurological manifestations. Symptoms generally start 4–7 days after the mosquito bite. The acute phase is characterized by painful polyarthralgia, high fever, asthenia, headache, vomiting, rash and myalgia. In the chronic phase, incapacitating arthralgia persists for months^[7]. Neurological symptoms include encephalitis, encephalopathy and myelopathy or myeloneuropathy. Non-neurological systemic symptoms includes renal,

hepatic, respiratory, cardiac and haematological manifestations together with atypical manifestations including lymphadenopathy, oral ulcers and encephalitis^[8].

Chikungunya is a re-emerging debilitating viral disease for which any specific cure or vaccine is not available. Efforts should be made to eliminate vector populations. In this regard, control measures should be focused on eliminating the immature stages of the mosquitoes and their larval developmental sites. The best, economic and easy way of doing such a widespread elimination of vector and control of disease is by providing knowledge and awareness to the community as a whole. Therefore, the present study is taken to explore risk factors for the presence of chikungunya vectors and impart knowledge regarding chikungunya in rural population. The knowledge that could be gained in this investigation would help rural population to take certain preventive measures and also guide policy makers and health authorities to plan, design and initiate initiatives, programs, and policies regarding chikungunya prevention.

Material and Method

Study Design - Follow up study (cross-sectional study repeated at intervals). Statistical analysis was done by using descriptive and inferential statistics using chi-square test and software used in the analysis were SPSS 17.0 version and GraphPad Prism 6.0 version and $p < 0.05$ is considered as level of significance.

Study set up- Rural village Salod, Wardha District near rural hospital and College.

Duration - Two months, From 15th April, 2016 to 30th June, 2017.

Sample size- Seventy five participants will be studied from Salod village of Wardha district, on the basis of community that is being surveyed, in accordance with the relevant prevalence of disease^[9].

Study sample- Participants age more than 15 years were selected so that the individual will be clearly able to understand the questions and

provide with appropriate experience of disease if any. After obtaining written informed consent each participants house was visited by investigator using validated questionnaire. The data was gathered.

Institutional Ethical Clearance - The procedures followed were in accordance with the Institutional Ethics Committee.

Ref. No. DMIMS(DU)/IEC/2017-18/6286.

Questionnaire¹ – A total of 12 questions along with the general information of the participants were asked and total of 5 questions were for the investigator to assess. Questions were of Yes/No type. The questionnaire consisting part – A, consisted of questions that would tell about the participant's knowledge regarding spread of disease, its vector and the symptoms that occur in the diseased person, was filled by participants and part –B, consisted of what the investigator saw being practiced by the participant, was filled by investigator with marks allotted to each question. Awareness was imparted to the participants by oral discussion regarding chikungunya as well as pamphlet consisting of information was provided in local language to each participant. The participant's were informed about next visit by the investigator after Seven days in which the same questionnaire was given to check the improvement in the knowledge regarding chikungunya and sanitation improvement after those Seven days.

Statistical Analysis

Sample size calculation was done on the basis of prevalence of disease in Maharashtra^[10].

$$\text{Sample size } (n) = (Z\alpha/2)^2 \cdot p \cdot q / l^2$$

$$\text{Where, Constant } (Z\alpha/2) = 1.96$$

$$\text{Prevalence of disease } (p) = 59.2$$

$$q = 100 - p = 100 - 59.2 = 40.8$$

$$\text{Allowable error } (l) = 20 \cdot 59.2 / 100 = 11.84$$

$$\text{Hence } (n) = (1.96)^2 \cdot 59.2 \cdot 40.8 / (11.84)^2$$

$$n = 9278.847 / 140.18$$

$$n = 66.19$$

Considering drop out, sample size kept is 13% more than expected.

Statistical analysis was done by using descriptive and inferential statistics using chi-square test and software used in the analysis were SPSS 17.0 version and GraphPad Prism 6.0 version and $p < 0.05$ is considered as level of significance.

Result

Table/fig 1 Age wise distribution of participants

Age Group(yrs)	No of participants	Percentage (%)
15-19 yrs	11	14.67
20-29 yrs	21	28.00
30-39 yrs	20	26.67
40-49 yrs	7	9.33
≥50 yrs	16	21.33
Total	75	100
Mean±SD	34.43±15.41(10-75 yrs)	

Table/fig 2 Gender wise distribution of participants

Gender	No of participants	Percentage (%)
Male	35	46.67
Female	40	53.33
Total	75	100

Table/fig 3 Education wise distribution of participants

Education	No of participants	Percentage (%)
Literate	70	93.33
Illiterate	5	6.67
Total	75	100

Following are the significant statistical findings from the survey.

A total of 75 cases were interviewed during the study period. Demographic profile [Table/fig 1 and 2] showed that more than half [40 (53.33%)] among the cases were females, whereas [35 (46.67%)] of the controls were males. About half among the cases were of age between 30 and 50 years. Majority [70 (93.33%)] among the cases were literate.

¹ Refer Annexure at the end.

²Table/fig 4. Comparison of knowledge score of participants in pre and post test

Question	Pre Test		Post Test		χ ² -value	p-value
	Favor	%	Favor	%		
1. History of Admission/known admission due to Chikungunya?	72	96.00	75	100.00	4.08	0.34,NS
2. Chikungunya is caused by Mosquito bite?	2	2.67	69	92.00	158.8	0.0001,S*
3. Chikungunya Mosquito breed in : Clean Standing Water. Dirty Standing Water.	2	2.67	70	93.33	162.3	0.0001,S*
4. Chikungunya Mosquito bite during : Day Time Night Time	5	6.67	71	94.67	154.9	0.0001,S*
5. Symptoms of Chikungunya include: Fever Headache Rash Joint Pain (Athralgia) Muscle Pain (Myalgia)	0	0.00	75	100.00	200	0.0001,S*
6. Chikungunya can be prevented using mosquito net?	0	0.00	75	100.00	200	0.0001,S*
7. Wearing full dresses can prevent mosquito bite?	73	97.33	74	98.67	1.02	0.31,NS
8. Spraying insecticides can prevent mosquito breeding?	3	4.00	75	100.00	184.6	0.0001,S*
9. Sanding dirty water removal prevents mosquito breeding?	0	0.00	75	100.00	200	0.0001,S*
10. Use of Mosquito repellants can reduce mosquito breeding?	75	100.00	75	100.00	0	1.00,NS
11. Covering containers/tanks are effective method to reduce outbreak of Chikungunya?	0	0.00	53	70.67	110.10	0.0001,S*
12. Neem oil with coconut oil (1:1) (or Camphor, Lemon Grass oil) act as indoor Mosquito Repellent?	0	0.00	61	81.33	136.10	0.0001,S*

³Table/fig 5 Comparison of knowledge score of investigator in pre and post test

Question	Pre Test		Post Test		χ ² -value	p-value
	Favor	%	Favor	%		
1. The inhabitants used Mosquito Nets?	1	1.33	73	97.33	184.4	0.0001,S*
2. Inhabitants had covered the Container/Tank?	6	8.00	72	96.00	155.10	0.0001,S*
3. There is Garbage in and around the House?	6	8.00	75	100.00	170.40	0.0001,S*
4. Inhabitants had cleaned the standing water in and around the House?	1	1.33	5	6.67	4.68	0.030,S*
5. Inhabitants used Mosquito repellents during daytime?	58	77.33	64	85.33	2.07	0.14,NS

² * as p-values<0.05³ * as p-values<0.05

Majority [72 (96%)] had history of Admission/known admission due to Chikungunya, but none knew correctly about its symptoms [0%], as they couldn't relate these all symptoms to chikungunya. Majority of participants didn't know about vector and its breeding place [2 (2.67%)]. Most participants were unaware that mosquito bites in day time [5 (6.67%)]. All participants [75 (100%)] did know about the use of repellants as an effective way of eliminating mosquito, implying the effect of advertisement in its popularity and knowledge. None knew about household remedies such as use of Neem oil, camphor or lemon grass as an effective way of reducing risk of this disease. Though significant improvement can be seen with regard to all aspects of knowledge regarding the disease in post test [Table/fig 4]. With regard to the observation by the investigator substantial improvement in implementation of protective and preventive measure was seen in post test [Table/fig 5].

Discussion

Present study evaluated the knowledge and preventive practices regarding chikungunya infections among rural village population near the (Acharya Vinoba Bhave Rural Hospital) rural hospital and college. The results of our study have clearly demonstrated that after implementation of the knowledge (awareness) on chikungunya, causation, place of breeding, time of bite and symptoms participants were more knowledgeable regarding the concepts of chikungunya.

Even though many participants were familiar with Chikungunya being a communicable disease which spreads via mosquito vector, yet several misconceptions were identified. According to WHO guidelines on chikungunya, the *Aedes aegypti* mosquito typically bites during the day. A considerable population regarded *Anopheles* mosquito (malaria vector) and *Aedes aegypti* to have similar characteristics and habitat, along with their transmission patterns^[11]. This is most likely due to high prevalence of malaria causing *Anopheles* mosquito in developing countries, the

knowledge about which is generalized to the dengue mosquito by the common person.

Despite the fact that majority of our study population had heard about chikungunya somewhere, a good proportion did possess deficiencies in their knowledge about the disease as observed in our studies while taking pretest for participant and invigilator (Table 4 and 5) which were similar to studies conducted by Jai Pal Majra, Das Acharya, which concluded that people who had knowledge about the vector and methods of preventing the disease and had put their knowledge into practice are less likely to be affected by chikungunya.^[12] A large number of people considered chikungunya to be contagious, and an almost equal number were not sure whether it has person-to-person transmission.

Chikungunya is mostly a self-limiting viral disease. While recovery is the expected outcome, convalescence can be prolonged (up to a year or more), but recently a severe form of the disease with CNS involvement and fulminating hepatitis has been reported and persistent joint pain may require analgesic and long-term anti-inflammatory therapy. Female mosquitoes of this species deposit their eggs in a variety of water holding containers, such as jars used for domestic water storage, tyre and disposed off items that are filled with rain water. As a specific cure or an effective vaccine is not available, the disease control is limited to reduction of the vector population by making water holding containers unavailable for development of mosquitoes, killing the adult mosquitoes with insecticides or by interfering with mosquito human contact by screening the houses, using mosquito nets, mosquito repellents or wearing full dresses to avoid mosquito bites^[13].

The present study has shown that people who had knowledge about the vector and methods of preventing the disease and had put their knowledge into practice and had high possibility of being less effected by chikungunya. Our findings are in accordance with studies done by Benthem et al, Koenraadt et al in Thailand which reported a significant reduction of chikungunya

vectors and chikungunya fever cases in areas having clean-up campaigns before and during rainy seasons^[14,15].

Window and door screens were also a popular method of vector control. Domestic water container covers treated with or without insecticide can reduce chikungunya vectors to low levels and potentially affect chikungunya transmission^[16]. These results of our study displayed that the study population was using adequate preventive methods aimed at controlling both the vector's breeding and its spread after implementation of knowledge regarding chikungunya to them.

Several studies have shown that a higher literacy rate correlates with better knowledge scores. The above observations may be true only for the study population because of convenience sample and cannot be generalized to other populations belonging to different socio-economic or cultural backgrounds. Local studies are needed to provide the true picture about awareness regarding dengue fever so that appropriate specific action can be taken for control of disease.

Limitations

Proper observation of the implementation of the provided knowledge couldn't be carried out. Study is carried out in one given region only, a larger population surveyed would reveal better correlation.

Conclusion

In the end of our study there can be seen a substantial increase in education of individuals regarding the Chikungunya fever and the percentage of unaware individuals have decreased substantially. We have found a low prevalence of sufficient knowledge in our sample population based on overall knowledge score on chikungunya. Data obtained in our study shows as the knowledge score of participants regarding chikungunya fever increases; knowledge score of invigilator also increased positively at pre and post test, both. The available evidence from

population is limited and there is a need for a nationally representative survey to assess the knowledge and attitudes regarding chikungunya and any misconception in the general population. Therefore, in the absence of any specific cure or effective vaccine, health education can prove to be an important tool for the control of chikungunya epidemic.

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Annexure:**Questionnaire Part – A****To be filled by Study Group Participants**

1. Name :
2. Age :
3. Sex :
4. Education : Literate
Illiterate
5. History of Admission/ known admission due to Chikungunya
Yes: No:
6. Knowledge on Chikungunya
 - a. Chikungunya is caused by Mosquito bite
Yes: No:
 - b. Chikungunya Mosquito breed in :
Clean Standing Water
Dirty Standing Water
 - c. Chikungunya Mosquito bite during :
Day Time
Night Time
 - d. Symptoms of Chikungunya include :
Fever
Headache
Rash
Joint Pain (Athralgia)
Muscle Pain (Myalgia)
7. Knowledge on Chikungunya prevention :
 - a. Chikungunya can be prevented using mosquito net
Yes: No:
 - b. Wearing full dresses can prevent mosquito bite
Yes: No:
 - c. Spraying insecticides can prevent mosquito breeding
Yes: No:
 - d. Sanding dirty water removal prevents mosquito breeding
Yes: No:
 - e. Use of Mosquito repellants can reduce mosquito breeding
Yes: No:
 - f. Covering containers/tanks are effective method to reduce outbreak of chikungunya.
Yes: No:
 - g. Neem oil with coconut oil (1:1) (or Camphor, Lemon Grass oil) act as indoor Mosquito Repellent.
Yes: No:

Part – B**To be filled by Investigator (Total-5 marks)**

1. The inhabitants used Mosquito Nets.
Yes: No:
2. Inhabitants had covered the Container/Tank.
Yes: No:
3. There is Garbage in and around the House.
Yes: No:
4. Inhabitants had cleaned the standing water in and around the House.
Yes: No:
5. Inhabitants used Mosquito repellents during daytime.
Yes: No: