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Research Article

Community Knowledge, Attitude, Awareness And Protective Practices Towards Epidemiology Of Chikungunya Disease Among Adults Living In Gurgaon District, Haryana, India

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ABSTRACT

Background: Since the appearance of Chikungunya in Africa in the 1950s, it has become a public concern throughout the whole world. Most recently, the disease is majorly circulating in Asia countries, most especially the densely populated ones like India.

Objective: This study incorporated the collection of data based on a designed questionnaire in order to understand and compare the amount of knowledge inhabitants of Gurgaon know about Chikungunya and also how this disease can be properly prevented.

Method: 162 participants were involved and all are 18 years and above. Anybody not above 18 or not living in Gurgaon district was excluded.

Findings:

- 11.7% of the participants know nothing about the disease.
- 85.8% of the participants know that the virus vector is mosquito but only 55.6% know that the vector is of Aedes species.
- 67.9% of the participants accepted that the best form of prevention is by keeping clean environment.
- 64.2% of the participants have never been educated about the disease by any health professional.
- Only 52.5% of the participants knew of its recent outbreak in country.
- There is a low degree of positive correlation (0.001) between the level of education attained by the participants and the knowledge of symptoms about the disease

Conclusion:

The knowledge and understanding of the cause and prevention of Chikungunya disease is among inhabitants of Gurgaon is insufficient.

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INTRODUCTION:

The word 'Chikungunya' is derived from a language called Kimankonde. This language is being spoken in Southern Tanzania and Northern Mozambique. Chikungunya means "to become contorted". Contortion in this sense describes the stoop appearance of the people suffering from the disease. The first report documented was about eleven decades ago in 1952-1953. In 1955, the disease was further described and attributed to same similarities as Dengue fever by W.H.R Lumsden.¹

Chikungunya disease is caused by a virus called CHIKV transmitted by mosquitoes; the arthropod vector. These mosquitoes are of the Culicine family and from the genus Aedes; mainly Aedes aegypti and Aedes albopictus which is mostly persistent in an urban cycle. The virus belongs to the Alphavirus genus which comprises of other arthritogenic viruses like Sindbis, Ross River, Mayaro, O'nyong-nyong, Barma and Semliki forest viruses. This disease is among the significant arthropod-viral disease causing a significant threat to human and veterinary medicine worldwide. Since the virus has been isolated in 1952, it's shown to be an etiologic agent of sporadic epidemics in Africa and Asia. It has diversified its geographic eminence since 2004 spread across the Indian Ocean Islands, Italy, France and the Americas. In 2006, Chikungunya virus re-emerged in South East Asia causing an estimate of 1.3million cases². Chikungunya fever is deliberating Arthritic disease which have caused immeasurable morbidity and mortality in humans, especially in the paediatric population^{3,4}. This disease is known to circulate with subtropical and tropical regions, can affect up to 1 billion people and have the tendency of multiplying in regions where poverty-stricken people reside³.

CHIKV infection is a serious public health disease that can significantly affect both the economy and the health system of a country. In the body, different cells like endothelial cells, epithelial cells, primary fibroblasts and monocyte-derived macrophages are able to sustain CHIKV infection. The target cell of the virus is affected through receptor mediated endocytosis. No cellular receptor has been identified to date⁵.

Epidemiology And Geographical Distribution

Typically, CHIKV is found being transmitted in Africa and South-East Asia. Majority of it epidemics have occurred in both regions since it's origination. In 2004, a huge outbreak was recorded in Lamu Island in Kenya (about 13,500 persons recorded) and spread through the neighboring

islands to La Reunion in 2005. Both ECSA and Asian genotype of this virus are responsible⁷. The isolate of the virus collected in 2006 suggested increased viral fitness in Aedes albopictus mosquitoes. Though the outbreaks in Africa have been relatively low, there was a large outbreak in 1999-2000 in the Democratic Republic of Congo and 2007 in Gabon.¹³ Followed by spread in several islands in Indian Ocean and India. In 2007, the spread in India moved towards Sri Lanka, Malaysia, Thailand and lastly, Italy. This virus resurfaced again in La Reunion in 2009 leading to re-importation of CHIKV to Europe in May 2010. The Italian Outbreak involved approximately 300 persons and this was the first significant outbreak in a subtropical area where Aedes albopictus was the only vector.^{7,14} In 2012 it was transmitted in more countries; Oceania, Central Africa, Southern and South Eastern Asia, Western Indian Ocean Islands and Europe. From 2012-2013, the virus cases were reported continuously in South-Eastern, Southern, Eastern and Western Asia; Central and Western Africa; Western Indian Ocean Islands.⁷ France reported 2 indigenous cases in the French part of the Caribbean Island of Saint Martin in 2013. After that local transmission have been reported in over 43 countries in the Americas. Over 1,379,788 suspected cases of the disease have been recorded in the Caribbean Islands, Latin American Countries and the United States of America as of April, 2015. Colombia had the biggest burden of CHIKV virus cases in the Americas. The first indigenous transmission was reported in Argentina in 2016 following an outbreak of over a thousand cases. As of 2017, Pakistan is still recording cases of this disease from the outbreak of 2016.¹³ Geographically, the range of Chikungunya virus is mainly in Africa, Asia and Australia.

Chikungunya Outbreak In India

Chikungunya was first reported in India in early 1960s. Its spread was confirmed in Calcutta, now Kolkata between 1963-1964. This Calcutta outbreak started around July, reached its peak in November 1963 and started declining from December, same year. About 300,000 people was affected by the virus in year 1965 in Chennai. In 1973, an epidemic was reported in Barsi, Maharashtra. In 2005, cases were reported from Andhra Pradesh and Karnataka. More than 1 million cases were reported in 2006, mostly in Maharashtra, Tamil Nadu, Madhya Pradesh and Gujarat. Phylogenetic analysis of the virus strain based on partial sequences of NS4 and E1 genes confirmed that the isolates were of African genotype.^{15,16,17} All the earlier isolates were of Asian genotype. The reported morbidity hit back

was about 37.5%. 1.3 million suspected cases were reported. Before the outbreak in 2016, the last one was in 2005. Reports showed that more than 2,600 cases of the infection were recorded in Delhi, India from January to September 2016. 15 patients died due to the complications related to this illness. Across the country, more than 12,250 cases were reported by the National Vector Borne Disease Control Programme of the country same year. The number of cases were maximum in South Delhi Municipal Corporation (SDMC).¹⁸ These epidemics affected children and elderly population mostly. The entry of Chikungunya into the country is still unknown¹⁷. As of 2017, 80 cases of chikungunya infection in Delhi have been reported from January to April. The viral vector is known to maximize during the rainy season and it's expected to peak from October to November¹⁹. In June 2017, total of 146 cases have been reported. 10 was recorded in May, 19 reported in April, 34 confirmed in March, according to the South Delhi Municipal Corporation (SDMC). This adds up to the one of the worst outbreak of 2016 in Delhi which was 12,221 out of which, 9749 were confirmed cases.

MATERIALS AND METHODS

A descriptive cross-sectional study was conducted from July to October 2017, inhabitants living in Gurgaon District, Haryana, India. The participants were 162 (101 males and 61 females) in total including both males and females. The study was conducted at the period of peak of widespread of mosquito borne diseases like Chikungunya and Dengue. A structured pre-tested questionnaire was developed with the

RESULTS

questions related to patterns of knowledge, attitude and practices towards the understanding and prevention of Chikungunya disease. Based on the questions, the questionnaire was divided into three distinct sections in order to finalize the level of understanding of the disease. The type of sampling used was simple random sampling, with the age of participants; 18 and above. Data entry and statistical analysis were carried out using Microsoft excel 2016 and SPSS 21 version. Descriptive statistics (mean, mean standard deviation and proportion) were used to summarize the quantitative and qualitative variables. The individual Student's t-test was used to compare the mean values of the continuous variables across the levels (2 and 3) of categorical variables.

Ethical Considerations

Pre-notification and information about the survey was discussed with the participants in-person and telephonic contact. During survey visits, the study coordinators introduced themselves and explained to the participants, the aim and objectives of the study and all procedures to be followed in filling the questionnaires. Illiterate participants were interpreted to in Hindi. Subject number was given to each of the participants and the names were recorded as initials. All other personal information was removed before data entry on the database.

Table 1: Total Number/Gender of participants

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Male	101	62.3	62.3	62.3
Valid Female	61	37.7	37.7	100.0
Valid Total	162	100.0	100.0	

Table 2: Definition of the age of the population

	N	Minimum	Maximum	Mean	Std. Deviation
Age	162	18.00	93.00	25.8580	8.19852
Valid N (list wise)	162				

Table 3: Participants of the participants that have heard about the disease.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	143	88.3	88.3	88.3
No	19	11.7	11.7	100.0
Total	162	100.0	100.0	

Table 4: Participants that know the cause is by mosquito.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	139	85.8	85.8	85.8
No	23	14.2	14.2	100.0
Total	162	100.0	100.0	

Table 5: Participants that know the mosquito specie is Aedes.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	90	55.6	55.6	55.6
No	72	44.4	44.4	100.0
Total	162	100.0	100.0	

Table 6: Correlating the level of education of the participants with the knowledge of symptoms and prevention of Chikungunya disease.

	Highest Education Attained	Do you know the symptoms?	Do you know how chik can be prevented?
Highest Education Attained	Pearson Correlation	1	.060
	Sig. (1-tailed)		.225
	N	162	162
Do you know the symptoms?	Pearson Correlation	.060	1
	Sig. (1-tailed)	.225	.489**
	N	162	162
Do you know how chik can be prevented?	Pearson Correlation	.091	.489**
	Sig. (1-tailed)	.125	.000
	N	162	162

** . Correlation is significant at the 0.01 level (1-tailed).

Table 7: One Sample T-test for the level of knowledge about Chikungunya virus.

	Test Value = 0					
	t	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Have you ever heard of Chikungunya?	44.060	161	.000	1.11728	1.0672	1.1674
Do you know its caused by a mosquito?	18.028	161	.000	1.20370	1.0718	1.3356
Do you know the symptoms?	36.823	161	.000	1.24074	1.1742	1.3073
Do you know the mosquito specie is Aedes?	36.884	161	.000	1.44444	1.3671	1.5218
Sudden fever symptom?	36.021	161	.000	1.29630	1.2252	1.3674
Joint pain symptom?	36.150	161	.000	1.38889	1.3130	1.4648
Encountered any chik patient?	36.993	161	.000	1.45062	1.3732	1.5281
You know of its recent outbreak in India?	37.485	161	.000	1.47531	1.3976	1.5530

Table 8: Participants that believe that prevention is use of Mosquito Nets.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	77	47.5	47.5	47.5
Valid No	85	52.5	52.5	100.0
Total	162	100.0	100.0	

Table 9: participants that believe that prevention is use of Mosquito Repellents.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	88	54.3	54.3	54.3
Valid No	74	45.7	45.7	100.0
Total	162	100.0	100.0	

Table 10: participants that believe that prevention is by keeping Clean Environment.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid yes	110	67.9	67.9	67.9
Valid no	52	32.1	32.1	100.0
Total	162	100.0	100.0	

Table 11: participants that believe that prevention is by being Fully Clothed.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	66	40.7	40.7	40.7
Valid No	96	59.3	59.3	100.0
Total	162	100.0	100.0	

Table 12: participants that believe that prevention is by Use of Insecticides.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid yes	51	31.5	31.5	31.5
Valid no	111	68.5	68.5	100.0
Total	162	100.0	100.0	

Table 13: participants suggested other forms of prevention.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid clean containers	156	96.3	96.3	96.3
Valid discard unwanted tyres and containers	1	.6	.6	96.9
Valid empty containers	1	.6	.6	97.5
	2	1.2	1.2	98.8

fogging and biological fish	1	.6	.6	99.4
Fumigation	1	.6	.6	100.0
Total	162	100.0	100.0	

Table 14: Number of Participants knowing of the recent outbreak in India.

	Frequency	Percent	Valid Percent	Cumulative Percent
yes	85	52.5	52.5	52.5
Valid No	77	47.5	47.5	100.0
Total	162	100.0	100.0	

Table 15: Participants that have discussed about the disease with any medical professionals.

	Frequency	Percent	Valid Percent	Cumulative Percent
yes	58	35.8	35.8	35.8
Valid no	104	64.2	64.2	100.0
Total	162	100.0	100.0	

Table 16: Participants that have discussed about the disease with non-medical professionals.

	Frequency	Percent	Valid Percent	Cumulative Percent
yes	93	57.4	57.4	57.4
Valid no	69	42.6	42.6	100.0
Total	162	100.0	100.0	

DISCUSSION

Chikungunya viral disease and other mosquito borne diseases are always on the rise in densely populated countries, especially those with coastal areas. This is

because such country city arrangements assist in breeding of the vector. Gurgaon city in India have this characteristic. The knowledge and prevention of Chikungunya in India still remains poor most especially in rural areas. This survey was aimed at

outstanding how much inhabitants of Gurgaon know about this disease and how much they know about its prevention. Even at the peak of the vector's growth cycle, some people did not have any idea of it. Spill over occurs almost every year most especially from enzootic cycle into the cities and there are possibilities of the disease affecting inhabitants of Gurgaon if the vector isn't properly controlled. According to the survey result, 19 (11.7%) of the inhabitants have never heard of this disease even though it has been protruding in India since the 1960s and the worst outcome so far that occur in 2016. These 19 inhabitants are all students. So there is need for health educators and medical professors to assist in teaching students about mosquito borne diseases most especially chikungunya and dengue. There is a low degree of positive correlation (0.001) between the level of education attained by the participants and the knowledge of symptoms about the disease. 139 (85.8%) participants know the vector of the virus is a mosquito, but only 90 (55.6%) of them know the specie is *Aedes*. This is important because people need to understand about the life cycle and nocturnal properties of the vector so as to be able to go extra mile in preventing them from parading the society. 110 (67.9%) of the participants picked that the form of preventing the disease is by keeping clean environment. 66 (40.75) picked being fully clothed. 51 (31.55) chose use of Insecticides, 88 (54.3%) chose mosquito repellents and 77 (47.5%) chose the use of mosquito nets. Also, only 6 of the participants have a versatile knowledge towards the prevention of the disease. They mentioned other forms of prevention like emptying all containers around the homes, use of biological fishes, fogging and fumigation. The medical professionals are of huge assistance in making people aware of this disease. Sadly, 104 (64.2%) of the participants have never discussed this disease with any medical professional. Although 93 (57.4%) have done so with their colleagues which are not health professionals.

CONCLUSION

The knowledge and understanding of the cause and prevention of Chikungunya disease is among inhabitants of Gurgaon is insufficient. This is because

there is a high probability of its re-occurrence every year, meanwhile some people still haven't heard about it. Many of the participants from this survey don't know about the specie of the vector that carries this virus making it difficult to fully understand its control and prevention of enzootic spill overs. Also the medical professionals have been very reluctant in widely educating Gurgaon society about this disease.

RECOMMENDATIONS

- More public health activities on enlightening the society about Chikungunya disease.
- Faster regulatory approval of any possible vaccine in order to prevent the onset of the disease.
- Medical professionals should be encouraged to talk to any of their patients about the disease.
- Mapping out of all most densely populated or river line areas in order to constantly monitor any possible outbreak.
- Pushing the campaign for keeping the environment clean at all times.

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