

ORIGINAL ARTICLE

CHIKUNGUNYA FEVER: THE RESURGENCE AND EPIDEMIOLOGICAL PATTERN IN WESTERN INDIA

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ABSTRACT

Background: After a lapse of 30 years Chikungunya fever has re-emerged with involving millions of people leaving a number of them with significant morbidity and hampering their day to day activities and affecting the life of millions related to them thus making it a major threat to public and national health.**Objectives:** To detect the prevalence and epidemiological pattern of Chikungunya fever.**Materials & Methods:** Serum samples from the patients with clinically suspected Chikungunya fever were screened for presence of IgM antibody against Chikungunya virus by capture ELISA over a period of 3 years and the pattern of disease was studied.**Results:** 439 serum samples from suspected cases were tested for presence of IgM antibody and in 32.8% it was found to be positive. The number of suspected cases has increased significantly over the study period. CHIKV was more common in rural areas (71%) than in urban areas. Positivity rate from rural and urban was 32% and 36% respectively. Cases were seen throughout the year the maximum (69.9%) was in post monsoon season. Females were the predominant sufferer comprising 58% of the total suspected. All the age groups suffered from CHIKV but majority was from 51-60 years of age.**Conclusions:** Chikungunya fever has re-emerged as the major public health problem and the cases are on rise every year with disease mainly affecting the rural population particularly females. Chikungunya fever though expected to be related to monsoon and post monsoon seasons is showing its presence throughout the year and involves all age groups.**Keywords:** - Chikungunya virus (CHIKV), Immunoglobulin M (IgM).

INTRODUCTION

Chikungunya fever is an arbovirolosis caused by Chikungunya virus (CHIKV), a mosquito-transmitted alphavirus belonging to the *Togaviridae* family [1,2]. The disease typically consists of an acute illness with fever, skin rash, and incapacitating polyarthralgia [2]. The latter distinguishes Chikungunya fever from dengue, which otherwise shares the same vectors, symptoms, and geographical distribution. The word chikungunya, which is used for both the virus and the disease, means "to walk bent over" in the African dialect Swahili or Makonde, and refers to the effect of the incapacitating arthralgia [2]. The virus can circulate between mosquitoes and naive human hosts in a cycle similar to that of dengue viruses. *Aedes aegypti* and *Aedes albopictus* mosquitoes are the main vectors responsible for transmission of CHIKV [3]. CHIKV was first isolated in 1952, during a Tanzanian outbreak [1,2]. The first significant urban outbreaks of chikungunya fever were documented in the early 1960s in Bangkok and from 1963 through 1973 in India [4]. The last outbreak of the

infection in India occurred in 1973 [2]. Minor outbreaks periodically occurred over the next 30 years, but no major outbreaks were recorded until 2004, when a large epidemic started on the coast of Kenya [4,5]. In India the outbreak started in 2005 from the coastal regions of Andhra Pradesh and Karnataka. With more than 1.3 million people estimated to be affected CHIKV prevailed across 150 districts of 8 states in India. Despite the number estimated, the actual disease burden was thought to be much higher due to potential underestimation from lack of accurate reporting [6-8]. In addition, at least 18 countries throughout Asia, Europe, and North America documented imported cases of chikungunya fever, with a few of these countries developing local autochthonous transmission of the virus [4]. It is also conceivable that chikungunya virus never disappeared entirely from the Indian subcontinent, and that the current outbreak is because of a simple resurgence. Chikungunya is a specifically tropical disease. It is relatively uncommon and poorly documented [2,6]. The high morbidity and loss in daily activity associated with CHIKV infection results in

considerable economic loss among the affected nations, specifically India [6]. This emphasizes the need to have a detailed understanding of epidemiology and planning a prevention strategy. Towards this end the present study aimed to evaluate the disease prevalence at geographical region.

METHODS AND MATERIAL

The study was done at a tertiary care centre over a period of three years from 2010 to 2012. IgM antibodies were detected in serum collected from the samples received from the suspected cases of Chikungunya fever. Anti Chikungunya IgM antibodies were detected in serum by IgM capture ELISA as per manufacturer’s instructions.

RESULTS

Total 439 serum samples from suspected cases were tested for presence of IgM antibody and in 32.8% (n=144) it was found to be positive. (Table 1)

The number of suspected cases has increased significantly over the study period from 29 cases in 2010 to 110 in 2011 and 300 in 2012. (Table 1)

Table 1: IgM positivity in suspected cases of Chikungunya fever

Year	Male		Female	
	Total	Positive	Total	Positive
2010 (n=29)	10	6	19	10
2011 (n=110)	42	10	68	17
2012 (n=300)	129	35	171	66
Total	181	51	258	93

It was observed that the CHIKV was more common in rural areas 71% of the cases while in urban areas the suspected cases were 29% of the total. Positivity rate from rural and urban was 32% and 36% respectively. (Table 2)

Table 3: Distribution of Chikungunya fever in different age groups:

Age group (in yrs)	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90
Total (n=439)	15 (3.4)	52 (11.8)	55 (12.5)	80 (18.2)	96 (21.8)	72 (16.4)	42 (9.5)	10 (2.2)	2 (0.4)
Positive (n=144)	1(0.6)	6(4.1)	17(11.8)	29(20.1)	41(28.4)	30(20.8)	14(9.7)	4(2.7)	2(1.3)

Finger in parenthesis indicate

DISCUSSION

The present study highlights the increase in number of Chikungunya cases every year and emphasises urgent need to plan and implement effectively the prevention strategy. Females are the more common sufferer as compared to males but that cannot be associated with gender bias though may be associated with the life style in this geographical region where females continued to

Table 2: Distribution of Chikungunya in urban and rural areas

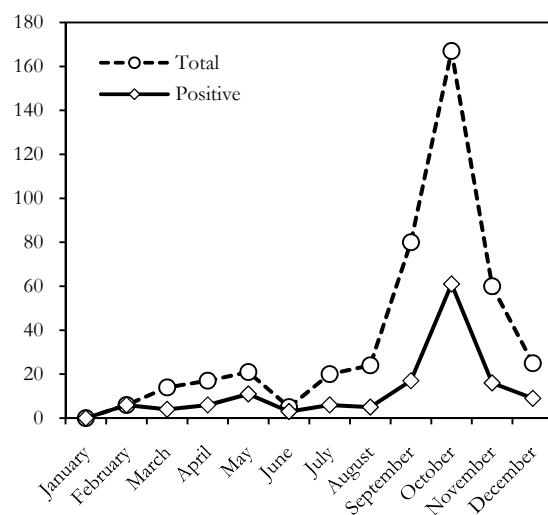
	Urban	Rural
Total suspected	126	313
Positive	46	98

Cases were suspected throughout the year except for the month of January, the maximum number 307 (69.9%) was in post monsoon season from the month of September to November. (Figure 1)

Females were the predominant sufferer comprising 58% of the total suspected and 64.5% of the total serum positives. (Table 1)

All the age groups suffered from CHIKV but majority 69% was from 21-60 years of age and the same age group had maximum sero positivity 81.2% of the total positive for IgM. (Table 3)

Figure 1: Month wise pattern of Chikungunya fever



be present in house than males and the day biting habit of the mosquito. Similar findings were observed by other studies [6,10]. Another interesting observation is that there is more number of cases from rural areas than urban though one expects the numbers other way around because of the more artificial breeding places for the vector in urban areas [3]. This may be associated with lack of awareness and access to vector control measures, sanitation and more sedentary life style of the

rural areas. More studies need to be undertaken to prove this hypothesis and to further address the susceptibility of the rural population to Chikungunya infection.

In present study the maximum number of cases was in the monsoon and post monsoon season but the cases were suspected throughout the year and also have seen confirmed cases from the laboratory whole year. This is an alarming sign that warrants year round surveillance of CHIKV in region that already has high prevalence and also use of the preventive measures round the year [6]. Our finding on higher detection rate of chikungunya among adults as compared to children confirms most of those reported worldwide [6,11,12].

We conclude from the present study that was undertaken to determine the epidemiology of Chikungunya fever that the incidence is across a wide age group with year round involvement of large number of patients. Our study clearly demonstrates high incidence of CHIKV in rural region than in urban region. With increase seen in number of cases every year, this warrants continuous CHIKV surveillance to determine the disease burden for improved healthcare.

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