



## EPIDEMIO-MICROBIOLOGICAL STUDY OF CHIKUNGUNYA CASES IN SOUTHEAST REGION OF RAJASTHAN INDIA

### Medical Science

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### ABSTRACT

**Background:** Chikungunya is a mosquito-borne, viral, acute febrile illness that can be difficult to distinguish clinically. Since the incidence of this disease is increasing, it is necessary to study the incidence and prevalence of the disease to find out the measures to stop the spread of the disease. The study was done as epidemiologically in kota region in all age group.

**Materials & Methods:** This was a retrospective study conducted in the microbiology department of a Government Medical College Kota (Rajasthan) during one year period (November 2015 to November 2016). The study included 2600 patients of all age group who had clinically suspected cases of characterized by acute illness with fever, skin rash, painful myalgia and polyarthralgia. Chikungunya IgM antibodies were detected in serum by IgM capture ELISA

**Results:** 2600 serum samples from suspected cases were tested for presence of IgM antibody and in 330 it was found to be positive. The number of suspected cases has increased significantly over the study period. CHIKV was more common in respectively. Cases were seen throughout the year the maximum was in post monsoon season. Males were the predominant sufferer 53.40% and female was 46.60% of the total suspected. All the age groups suffered from CHIKV but maximum number of majority were from 21-60 years of age group.

**Conclusions:** Present study 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. Chikungunya fever is self limiting; the morbidity can be very high in major outbreaks in all age groups, resulting in a heavy social and economic tolls. The prevention of the disease requires a planned approach, besides knowledge and awareness on the early warning signs A community empowerment and mobilization is crucial for the prevention and control of Chikungunya.

### KEYWORDS

Epidemiological Infection Of Chikungunya Virus

### INTRODUCTION

Chikungunya (CHIKV) fever is a re-emerging viral disease characterized by abrupt onset of fever, skin rash and incapacitating arthralgia. <sup>[1]</sup> Chikungunya virus (CHIKV) is a RNA virus belonging to genus Alphavirus and family Togaviridae. Chikungunya fever outbreaks have been affecting many countries since January 2005. The outbreak which occurred in 2006 appeared to be more severe and one of the biggest outbreaks caused by CHIKV in India affecting over 13 lakh people. <sup>[2,3]</sup> This disease was first described in 1955, following an outbreak on the Makonde Plateau along the border of Tanganyika and Mozambique <sup>[4]</sup> Chikungunya and dengue are mosquito-borne, viral, acute febrile illnesses that can be difficult to distinguish clinically <sup>[5]</sup> Chikungunya virus is an arthropod-borne virus that is transmitted by *Aedes aegypti* and *Aedes albopictus* mosquitoes. The virus transmission cycle requires infection of female mosquitoes via a viraemic bloodmeal taken from a susceptible vertebrate host and, following a suitable extrinsic incubation period, transmission to another vertebrate host during subsequent feeding <sup>[6]</sup> *Aedes albopictus* was identified as the only vector of a principally urban transmission. During this outbreak, severe or complicated forms of Chikungunya were reported in adult patients, including encephalopathy and hemorrhagic fever, which frequently occurred in the context of chronic diseases or underlying conditions such as diabetes mellitus, chronic obstructive pulmonary disease, ischemic heart disease, chronic renal failure, or alcoholic hepatopathy. <sup>[7]</sup> In India outbreak started in 2005 from the coastal regions of Andhra Pradesh and Karnataka. With more than 1.3 million people estimated to be affected Chikungunya virus prevailed across 150 districts of 8 states in India <sup>[8]</sup> Despite the number estimated, the actual disease burden was thought to be much higher due to potential underestimation from lack of accurate reporting. 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. 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. The high morbidity and loss in daily activity associated with Chikungunya <sup>[9]</sup> The virus is currently causing one of the largest reported outbreaks of chikungunya fever in last 40 years. In one study

over 12% of patients who contract Chikungunya virus infection develop chronic joint symptoms. There is no antiviral drug or medicine specifically for Chikungunya. But since chikungunya is cured by immune system in almost all cases there is no need to worry. Treatment usually is for the symptoms and includes taking sufficient rest, taking more fluid food and medicines to relieve pain. Currently there is no vaccination against Chikungunya. Research is ongoing on the development of DNA vaccination against Chikungunya <sup>[10]</sup> 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

This was a retrospective study conducted in the microbiology department of a Government Medical College Kota (Rajasthan) during one year period (November 2015 to November 2016). The study included 2600 patients of all age group who had clinically suspected cases of characterized by acute illness with fever, skin rash, painful myalgia and polyarthralgia. IgM antibodies were detected in serum collected from the samples received from the suspected cases. Chikungunya IgM antibodies were detected in serum by IgM capture ELISA as per manufacturer's instructions.

### RESULTS AND DISCUSSION

Out of 2600 patients presented clinically suspected cases of characterized by acute illness with fever, skin rash, painful myalgia and polyarthralgia were tested for Chikungunya IgM antibodies were detected in serum. IgM antibodies positive diagnosis could be possible in 330 (12.69%) serum collected Sample in the present study.

The preponderance of males was seen in present study as among the total number of cases studied males were 176 (53.33%) and females were 154 (46.67%). In this study, more males were affected than females due to socioeconomically works. Similar findings were reported by other investigators <sup>[9,11]</sup>

### Seroprevalence of Chikungunya Cases.

Total no. of samples tested	No. of positive samples	No. of positive samples NO. (%)
2600	330	12.69%

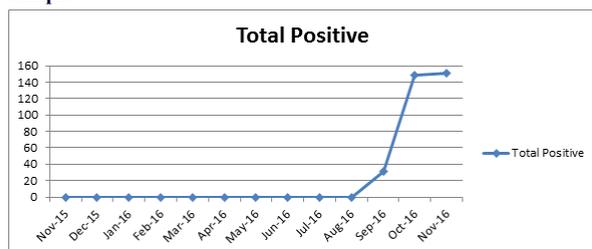
In this study, there was no significant difference between males 53.70% and females 45.30%. In some studies, men appeared to be more susceptible to dengue infection whereas in others, women were more affected, and no gender differences were noted in others. This inconsistency may relate to gender differences in exposure to infection due to community-specific habits, customs or behaviours<sup>[12]</sup>.

**Table:- 1.** Sex distribution of IgM antibodies Positive patient

	No of total sample	No of Positive sample	% of Positive sample
Male	1387	176	53.33%
Female	1213	154	46.67%
Total sample	2600	330	100%

Cases were suspected throughout the month of November 2015 to November 2016. The maximum number 330 was in post monsoon season from the month of September to November. In similar findings were observed by other studies<sup>[11]</sup>

**Figure:-1** Month wise pattern of chikungunya antibodies positive sample.



In the present study maximum number of patients 153 (46.40%) were from 21-40 age group, followed by 88(26.70%) patients from 41-60 years age group, then 63 (19.10%) patients from 1 to 20 year age group, then 26 (7.80%) patients from 61-80 years age groups. Least infection rate was observed in >80 years age group 00 (0%). The maximum number of patients suffering from chikungunya virus in 21 to 60 age group. In similar findings were observed by other studies<sup>[11]</sup>

The geographical distribution had a significant influence on the prevalence of antibodies to the virus. This might be explained by the possible impact of ecological characteristics of the areas on the natural cycles of the arthropod-borne viruses under consideration<sup>[12]</sup>

**Table:- 2.** IgM Antibodies positive in different Age group.

AGE GROUP	NO OF POSITIVE SAMPLE	% OF POSITIVE SAMPLE
0-20	63	19.10%
21-40	153	46.40%
41-60	88	26.70%
61-80	26	7.80%
>80	00	00%
Total sample	330	100%

In the present study, the classical symptoms of fever with joint pain were observed. The disease had manifested after an incubation period of 2-4 days (range 3-12 days). The median duration of the fever was three days and for joint pain, it was four days in the acute phase. The illness was self-limiting.<sup>[11]</sup>

The infection is of acute onset and variable clinical features are common findings. The symptoms develop after an incubation period of 4 to 7 day (Incubation period lies between 1 and 12 days). In most of the cases the disease is self-limiting and the symptoms disappear within 5 to 7 days even without treatment. Rarely the symptoms may persist for a longer period and occasionally complications may develop<sup>[13]</sup>. Recent Indian study reported transmission of chikungunya virus by *Anopheles stephensi* too. The Indian Ocean outbreak is caused by transmission by *Aedes* only. The common reservoirs for chikungunya virus are monkeys and other vertebrates. The role of cattles and rodents has also been reported in the transmission of the virus. The CHIKV usually shows a periodicity with occurrence of disease in the community with latency intervals of 3-4 years, probably due to its cycle in monkeys. Following transmission, CHIKV replicates in the skin, and disseminates to the liver, muscle, joints, lymphoid tissue (lymph nodes and spleen) and brain, presumably through the Blood<sup>[14]</sup>. Infection with CHIKV is an emerging public health threat that should be addressed through prevention. Because there is no vaccine against

CHIKV, the cornerstone of prevention is to reduce *Ae. aegypti* mosquito populations by vector control strategies, mass education of the community by medical and paramedical staff at primary health centers, clearing stored water (mainly in construction sites) and personal protective measures<sup>[12]</sup>

## CONCLUSION

Present study 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. Chikungunya fever is self limiting; the morbidity can be very high in major outbreaks, resulting in a heavy social and economic tolls. The prevention of the disease requires a planned approach, besides knowledge and awareness on the early warning signs. An integrated vector management through the elimination of the breeding sites, the use of anti-adult and anti-larval measures and personal protection will contribute to the prevention of outbreaks. A community empowerment and mobilization is crucial for the prevention and control of Chikungunya.

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