

Seroprevalence of Chikungunya - An Archetype of Overlooked Disease in the Covid19 Era at Tertiary Care Hospital, Ahmedabad

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Abstract:

Background: Chikungunya (CHIK) is an overlooked, re-emerging arboviral disease. It is characterized by an abrupt onset of fever with severe arthralgia and rash lasting for 1-7 days. The disease is almost self-limiting and rarely fatal, but timely diagnosis is important for early symptomatic and supportive treatment. In Covid 19 Era limited information on CHIK confirmed cases is available from India.

Objective: The goal of this study is to find out the Prevalence of CHIK viral infection in a tertiary care hospital with its seasonal variation in year 2020.

Materials and Methods: Serum samples from patients with febrile illness with clinically suspected signs and symptoms of CHIK from January 2020 to December 2020 were included in the study. All samples were screened for CHIK IgM antibodies by Standard Diagnostic ELISA method.

Results: Out of total 3173 serum samples, 315 (9.92%) were positive for CHIK virus in year 2020. Adults in age group 31-60 years (46.98%) were mostly affected than any other age group. Cases were presented with symptoms mainly fever, joint pain, headache, body ache and joint swelling. Maximum cases were reported between months of September to December with Male (51.74%) predominance.

Conclusion: From present study it can be concluded that prevalence of CHIK positive cases still form significant percentage in our region. Rapid spread of CHIK, which requires continuous monitoring of viral circulation in both endemic and non-endemic areas and rapid implementation of CHIK control programmes. Hence it is essential to have proper diagnostic laboratory support, proper surveillance system and public awareness in order to prevent the epidemic situations in future.

Keywords: Chikungunya, Overlooked, Re-emerging, Prevalence, ELISA

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I. Introduction

Chikungunya disease is a vector borne infection caused by Chikungunya virus a single -stranded RNA Alpha virus from the family *Togaviridae*, the vector being *Aedes* species mosquitoes¹. The name CHIK is derived from the Makonde word which means "that which bends up" describing the stooped posture due to arthritic feature of the disease.² The incubation period is usually 2-3 days. The symptoms of these disease are sudden onset of crippling arthralgia accompanied with fever, chills, headache, nausea, vomiting, low back pain and rash lasting for a period of 1-7 days. The acute phase lasts for 2-3 days and may remit for 1-2 days after a gap of 4-10 days resulting in a "saddle back" fever curve.

Emergence and re-emergence of severe arboviral hemorrhagic fevers caused by mosquito borne viruses, such as dengue virus and Chikungunya (CHIK) virus, have been frequently reported in Indian subcontinent in past few years. Chikungunya is an emerging viral infection. In 2006, the CHIK virus (CHIK V) re-emerged in India after 32 years, causing epidemic affecting more than 1.4 million people across the 13 States, and post epidemic, a declining trend was seen till 2011.^{3,4} However >3-fold rise in suspected CHIK cases was noticed in 2016.⁵ The CHIK V infection gets lower priority in comparison to dengue (DEN) and other infectious diseases, probably because of its non-fatal outcome.^{6,7} In the recent past, CHIK V has shown increasing severity, and the co-circulation and co-infection of CHIK V along with other infections have increased the severity of

disease.^{8,9}Serodiagnosis is the most common approach for the diagnosis of the Chikungunya infection where the IGM antibodies against CHIK V are detected. Other reliable modes of laboratory diagnosis include the molecular methods like RT-PCR.

In the view of changing trends in the seroprevalence of Chikungunya disease with respect to geographical area, successive years of the study period, seasonal variations, severity of the patients and the need for hospitalization, this study has been under taken to know the seroprevalence of Chikungunya disease in the tertiary care hospital of Ahmedabad, Gujarat.

II. Material And Methods

The retrospective study was conducted in the Department of Microbiology, BJ Medical College, Ahmedabad from January 2020 to December 2020. About 5-10 ml of blood were collected from the patients after 5 days of fever and then the serum was separated. The serum samples were tested for Chikungunya (CHIK) IGM antibody using IGM antibody capture ELISA kit manufactured by NIV (NIV, Pune, India). The tests are carried out following the manufacturer's instructions.

Study Design:Prospective Quantitative study.

Study Location:Department of Microbiology, BJ Medical College, Ahmedabad, Gujarat.

Study Duration:January 2020 to December 2020.

Sample size: 3173 serum samples

Subjects & selection method: The study samples was drawn from patients who presented to Civil Hospital, Ahmedabad with clinical history of chikungunya like fever, joint ache, headache etc. from January 2020 to December 2020. Patients were divided according to age for the study analysis.

Group A-Age 0-15 years.

Group B- Age 16-30 years.

Group C- Age 31-60 years.

Group D- Age Above 60 years.

Inclusion criteria:

1. Both male and female.
2. Patients with Clinical history of Chikungunya like fever, joint ache, headache.
3. All age groups from 0 years to above 60 years.
4. Good quality serum samples.

Exclusion criteria:

1. Patients not presenting with significant clinical history.
2. Poor sample quality.

III. Result

A total of 3173 serum samples from suspected cases of CHIK were received during the period from January 2020 to December 2020, out of which 315 (9.92%) samples were positive for CHIK IGM antibodies Fig 1. Majority of cases were from age group 31 to 60 years – Group C (46.98%) followed by 16-30 years (35.87%) Fig 2. Of the total number of affected cases, 51.74% were Males and 48.25% were Females Fig 3. CHIK V-positive cases were recorded throughout the year, but the cases were significantly higher during the Post-monsoon period. The maximum number of cases were seen in the period from September to December as shown in Table1. Fever was the most common presenting feature seen in most of the cases (80%) followed by other clinical symptoms.

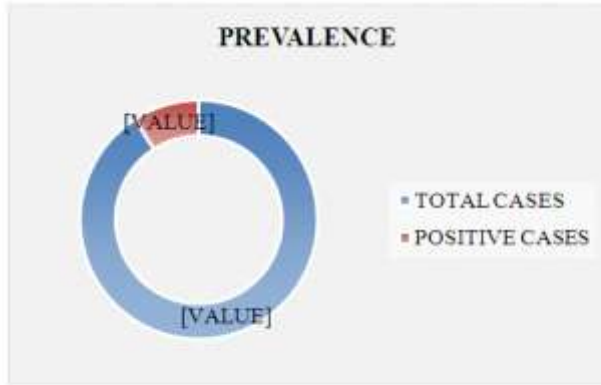


Figure 1 - Prevalence of CHIK IGM positive cases

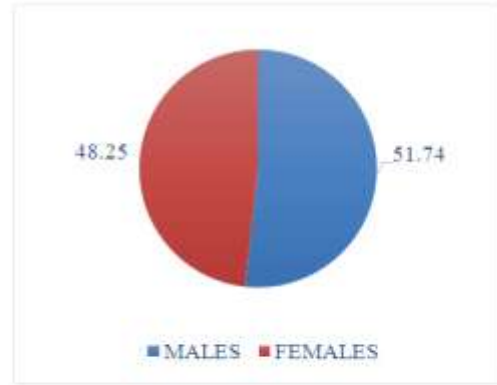


Figure 3 – Percentage of Sex distribution of CHIK IGM positive cases

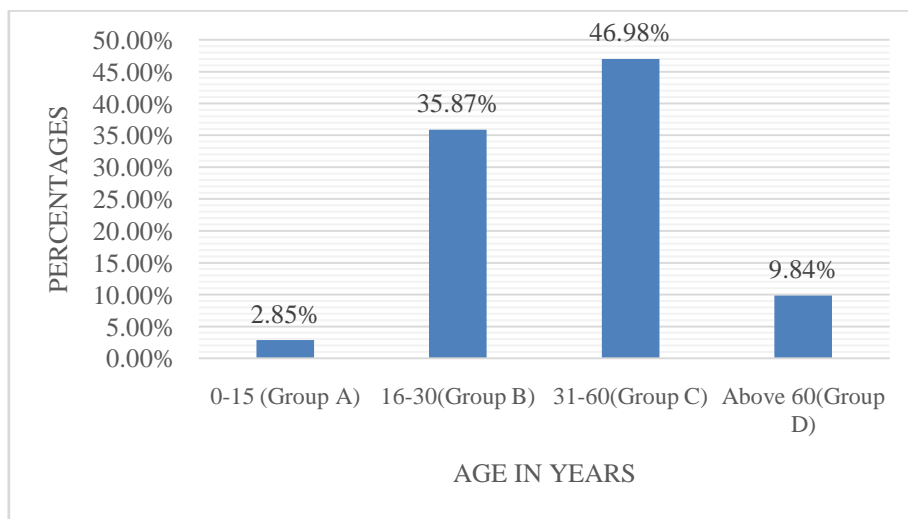


Figure 2 - Age wise distribution of CHIK IGM positive cases

Months	Total no. of samples tested	Number of positive cases
Jan-Feb (2020)	515	20
Mar-Apr (2020)	418	27
May-June (2020)	178	1
July-Aug (2020)	244	7
Sep-Oct (2020)	969	98
Nov-Dec (2020)	849	162
Total	3173	315

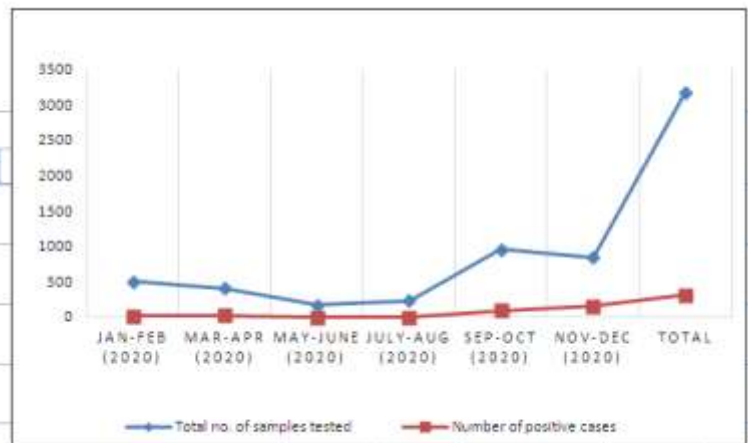


Table1: Seasonal distribution of CHIK seropositive cases

IV. Discussion

In our study, the seroprevalence of Chikungunya virus infection done by Chikungunya specific IgM antibody among the suspected cases were found to be 9.92% correlating to the studies by Raja Dina *et al* (9.93%)¹⁰ and Ravi *et al*³ in contrast to the studies by Mohanty *et al* (25.7%)¹¹ and Sodhatare *et al* (16.5%)¹². Infact the study by Sodhatare *et al*¹² in year 2015-2016 from our College showed a higher positive cases percentage (16.

5%). This shows the decreasing trend of Chikungunya infection in study. Patients between the age group of 31-60 years were more affected (46.98%) followed by 16-30 years of age (35.87%) which can be compared with the study done by Tomaret *al*¹³ and Sakhiya *et al*¹⁴. In present study males are more infected than females which was in concordance with the study of Tomaret *al*¹³ and Raja Dina *et al*¹⁰. The maximum number of cases in our study were seen between the months of September to December similar to the study by Shaikh *et al*¹⁵. The low prevalence rate in our study may be due to the newly entry of virus in this region although the presence of vector was reported from this region. Another reason for low prevalence rate may be due to asymptomatic and mildness presentation of the disease in the young age group.

V. Conclusion

The seroprevalence of Chikungunya in the present study was 9.92% with high frequency in monsoon months and affecting the productive age group of the population. Although the Chikungunya disease is self-limiting, but the timely diagnosis is must for proper symptomatic and supportive treatment. Hence it is essential to have proper diagnostic laboratory support, proper surveillance system and public awareness in order to prevent the epidemic situations in future.

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