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Original Research Article

Seroprevalence of Chikungunya Virus in Bharatpur District Rajasthan: A 4 Years Study

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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 prevalence and incidence of the disease to take the measures to stop the spread of the disease. The study was done as epidemiologically in Bharatpur region in all age group.

Materials & Methods: This was a retrospective study conducted in the central lab of a Government Medical College Bharatpur (Rajasthan) during four years period (January 2015 to October 2018). In this study 589 patients having suspicion of Chikungunya of all age groups characterized by acute illness with painful myalgia, polyarthralgia, fever and skin rash were included. IgM antibodies of Chikungunya were detected by IgM capture ELISA in serum.

Results: This study was done over suspected cases of chikungunya. 589 serum samples were collected and serum were tested for IgM antibody by Elisa method and in 122 it was found to be positive for Chikungunya. The number of suspected case were increased significantly over the study period. Number of samples were maximum in year 2016 and also positivity was (31.33%) in this year. Chickinguniya virus positivity was maximum in post monsoon season. Females were affected more 22.7% than males 18.5% of the total suspected. Majority of patients were in the age group of 21-60 years.

*Conclusions:*The present was done to find out the prevelance and incidence of chinkungiya and to estimate the burden of disease in the district of bharatpur .The study concluded that chikinguniya is prevalent throughout the year with the maximum prevalence seen during the monsoon reason.All the age groups are affected with maximum morbidity and mortality seen in the vunrelable group like children and people with preexisting disease and old people. The incidence of chikinguniya can be minimized with educating people about vector born diseases and how to control the spread of mosquitoes. A community awareness based approach can minimize the morbidity and mortality associated with chikinguniya and minimize the economic impact on the poor and margnilased people

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of developing country like india.

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Introduction

Chikungunya is a "debilitating non-fatal viral fever". The disease was first documented in 1952, following an outbreak on the Makonde Plateau, along the border between Tanganyika (Tanzina) and Mozambique. The name Chikungunya is derived from the Makonde word meaning "that which bends up" in reference to stooped posture developed as a result of the arthritic symptoms of the disease [1]. Chikungunya disease is a mosquito-borne viral infection causing fever, rash and arthralgia. In India, the virus was first isolated in 1963 in Kolkata [2] followed by epidemics in Chennai, Pondicherry and Vellore in 1964; in Visakhapatnam, Rajahmundry and Kakinada in Andhra Pradesh in 1965 and in Nagpur, also in 1965. The last officially recorded outbreak in India was reported in Barsi in Maharashtra in 1973 [3]. Chikungunya is an arboviral disease caused by Chikungunya virus (CHIVA). It is a member of family Togaviridae and genus alphavirus. It is an enveloped ribonucleic acid virus. RNA is single-stranded, linear, positive-sense of approximately 11.8 kb [4].

The disease is transmitted by the bite of the female Aedes aegypti and Aedes albopictus mosquitoes. Humans are thought to be the major reservoir of chikungunya virus for mosquitoes. Therefore, the mosquito usually transmits the disease by biting an infected person and then biting someone else. An infected person cannot spread the infection directly to other persons (i.e. it is not a contagious disease). Aedes aegypti mosquitoes bite during the day time. The Aedes mosquitoes that transmit Chikungunya breed in a wide variety of manmade containers which are common around human dwellings. These containers collect water, and include discarded tyres, flowerpots, old oil drums, animal water troughs, water storage vessels, and plastic food containers. Lack of public health infrastructure and all factors that promote uncontrolled mosquito breeding are conducive to outbreaks of Chikungunya, or other mosquito borne diseases [5].

Chikungunya fever has been originally distributed in several parts of Africa, South Asia and Southeast Asia. Recently in 2014, Chikungunya reached United States and cases have been reported from Florida by CDC Atlanta [6].

The Chikungunya fever presents with triad of symptoms fever, arthralgia and rashes. A very important feature of Chikungunya fever is a debilitating and prolonged arthralgia that primarily affects the peripheral small joints. While the acute febrile phase of the illness normally resolves within a few days, the pain associated with CHIKV infection of the joints typically persists for weeks to months or years together in chronic cases [7,8].

In the present study clinically suspected cases were tested by ELISA for Chikungunya IgM antibodies. Disease in general, serological diagnosis and the prevalence of Chikungunya in and around Bharatpur has been described.

Materials and Methods

The study was done in the period of Jan 2015 to Oct 2018. A total of 589 blood samples were collected from clinically suspicious chikungunya cases. Patients having symptoms of fever of more than >38.5^{0}C and polyarthralgia from RBM hospital, Bharatpur and nearby primary and community health centers. Pateinets were informed about the test before collection of blood samples. Three to four ml of blood was collect The serum samples were transported to the laboratory of SMS Jaipur in an ice box maintained at 2–8^{0}C tend with aspectic measures. The blood smaples were undergone centrifugation for separation of serum. Serum samples were labeled with patient ID number and then transported to the laboartoty in cold chain. Serum samples were tested for

Chikungunya IgM antibody with SD (standard diagnostics) Chikungunya IgM ELISA kits. Direct Enzyme linked immune sorbent assay (ELISA) was performed. The tests were performed according to manufacturers' instructions. The results obtained was presented by using tables and percentages.

Result

Out of 589 samples tested, 122 samples were found positive for Chikungunya IgM antibodies. The disease was more prevalent in 2016 (31.3%), followed by 2015 (19.2%) (Table 1/Fig. 1). Total 303 Females and 286 males were tested. 69 females (22.7%) and 53 males (18.5%) were affected. Females were more affected compared to males (Table 2).

Table 1:

2015	104	20	19.23
2016	233	73	31.33
2017	145	13	8.96
2018	107	16	14.93

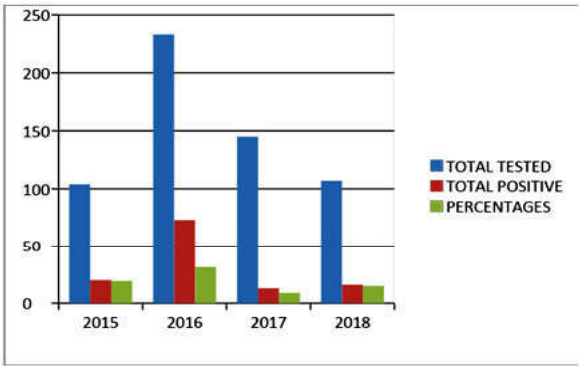

Fig. 1:

Table 2:

	Male	Female
Tested	286	303
Positive	53	69
Percentage	18.5%	22.7%

Discussion

Chikungunya is a emerging public health problem in developing countries of asia and Africa. A explosive outbreak of Chikungunya was observed in india in the year 2005-2006 which affected more than 1.4 million people in 13 states especially in southern India [9].

This febrile illness presents in previously healthy active person and ranges from mild disease to severe arhthralgias. Fever in which disease is of acute onset with with development of joint pain, muscle pain, headache and rash with time. Incubation period for development of fever is around 4to 7days which is abrupt in onset (range 1 to 14 days); Fever may be high grade (>39^{o}C); the usual duration of fever is 3 to 5 days (range 1 to 10 days). Polyarthralgias may begin two to five days after symptom of fever and usually involves many joints. Joint pain is commonly seen in small and large joints in most cases. Joint pain is similar to rheumatoid arthritis that is mainly bilateral, affecting distal joints more than proximal joints. Pain is more common in large joints, maybe intense and leading to difficulty in mobilisation in comparison to small joints. Fever and severe joint pain have positive predictive value for chikungunya virus infection in more than 80% percent of patients [10,11].

Narayan Shrihari et al., Done a study in and around Bellary district, Karnataka from 2009-2011 on prevalence of Chikungunya arboviral infection. In this study Chikungunya positivity was 24.75%. The number of positive cases were more in 2010 (28.04%), than 2009 (23.07%) and subsequently decreased in 2011 (19.05%). Male to female ratio was 0.98 [12].

Our study was done in Bharatpur, and was comparable to above study. We included cases with clinical suspicion of chikungunya virus infection in our study. Samples were taken from patients of fever and joint pain. In are study seropositivity of chikungunya was 20.7% in Bharatpur and nearby regions. Most of the seropositive cases were in 2016 (31.33%) in decreasing order 2015 (19.23%), 2018 (14.93%) and 2017 (8.96%) (Table 1/Fig. 1). Females (22.7%) were more affected compared to males (18.5%) (Table 2).

Conclusion

the crux of the study was that chikungunya is an important cause of morbidity and mortality in developing country like India especially in the region of Bharatpur. Adequate measures should be taken specially in the control of vector borne diseases to minimise the morbidity and mortality associated with chikungunya virus. Education of the community regarding the various ways to control the spread of chikungunya and the symptoms associated with chikungunya so as to help in early diagnosis and treatment should be undertaken. Special attention should be paid during monsoon and post monsoon season as a study found that the maximum number of cases were cluster during this time and this pattern is consistent in the last 4 years.

References

1. Text book of Medical Microbiology - Topley & Wilson's Microbiology and microbial infections by Brian W J Mahy & Leslie collier ninth edition volume 1.
2. Ramana KV, Prakash GK. Mystery behind emergence and re-emergence of Chikungunya virus. Ann Trop Med Public Health. 2009;2:1-3.
3. Yergolkar PN, Tandale BV, Arankalle VA, Sathe PS, Sudeep AB, Gandhe SS, et al. Chikungunya outbreaks caused by African genotype, India. Emerg Infect Dis. 2006;12:1580-3.
4. Text book of Medical Microbiology jawetz, Melnick & Adelbergs 24th edition.
5. Thiberville SD, Moyen N, Dupuis-Maguiraga L, Nougairede A, Gould EA, Roques p, deLamballerie X; Chikungunya fever: epidemiology, clinical syndrome, pathogenesis and therapy Antiviral research. 2013;99(3):345-70
6. Johansson MA, Powers AM, Pesik N, Cohen NJ, Staples JE. Now casting the Spread of Chikungunya Virus in the Americas. PLoS ONE. 2014;9(8):e104915.
7. Pialoux G, Alex B, Stéphane G, et al. Chikungunya, an epidemic arbovirosis- Review article. Lancet Infect Dis. 2007;7:319–27.
8. SD Suryawanshi, AH Dube, RK Khadse, SV Jalgaonkar, PS Sathe, et al. Clinical profile of chikungunya fever in patients in a tertiary care centre in Maharashtra, India. Indian J Med Res. 2009;129:438-41
9. Sudeep AB, Parashar D. Chikungunya: an overview. Journal of Bioscience. 2008;33(4):443-49.
10. Burt FJ, Rolph MS, Rulli NE. Chikungunya: a re-emerging virus. Lancet. 2012;379:662.
11. Lakshmi V, Neeraja M, Subbalaxmi MV. Clinical features and molecular diagnosis of Chikungunya fever from South India. Clin Infect Dis. 2008; 46:1436.
12. Narayan S, Kumudini TS, Mariraj J, Krishna S. The prevalence of chikungunya arboviral infection in and around bellary district, karnataka. Journal of evolution of Dental and Medical sciences. 2012; 1(5):677-81.