e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2023; 15(1); 1236-1239

Original Research Article

Study of Chikungunya and Dengue in Tertiary Care Hospital Jamnagar

Nitesh K. Patel[1], Nehal S. Patel[2], Sangita Vasava[3]

[1]Assistant Professor, MD Microbiology, Department of Microbiology, Dr. Kiran C. Patel Medical College & Research Institute, Bharuch

[2] Associate Professor, MD Physiology, Dr. Kiran C. Patel Medical College & Research Institute, Bharuch

3Assistant Professor, Medical Microbiology, Department of Microbiology, Dr. Kiran C. Patel Medical College & Research Institute, Bharuch

Received: 25-11-2022 / Revised: 25-12-2022 / Accepted: 30-01-2023

Corresponding author: Dr. Nitesh K. Patel

Conflict of interest: Nil.

Abstract

Dengue and Chikungunya are infectious diseases that often result in hospitalizations and are associated with high public health costs. Due to the similarity of symptoms between dengue and chikungunya, improved diagnostic tests are desperately needed. Thus ELISA plays a key role to differentiate between the two. The Aim/Scope of the study was to detect the seropositivity of Dengue and Chikungunya based on ELISA & study the trends in relation to season, region, gender and admission pattern. Study population included Serum Samples received from clinically suspected patients of Dengue and Chikungunya. Study period taken up was from June 2015 to May 2016. For Dengue, NS1 ELISA was done in fever less than 5 days while IgM ELISA was done in fever more than 5 days & IgM ELISA for suspected Chikungunya patients. Also, 42 samples tested for both Dengue and Chikungunya. Chikungunya showed a month wise steady increasing trend from August to December followed by downfall. Males showed more seropositivity for Dengue while Females, for Chikungunya. Jamnagar city showed more cases of Dengue while periphery of Jamnagar showed more cases of Chikungunya. Suspicious In patient cases showed more seropositivity for Dengue, thus suggesting Dengue being a more severe form and more life threatening. 42 samples that were sent for both Dengue and Chikungunya tests, showed that 12 samples were Positive for Chikungunya & one patient showed co-infection. Thus, apart from getting to know the seasonal, regional, gender and admission related differences between the two diseases our study also lead to the conclusion that cases suspected for Dengue should be tested for Chikungunya as well and vice versa, for limiting the chances of misdiagnosis/ under diagnosis and knowing actual rate of Incidence.

Keywords: Dengue, Chikungunya, IgM ELISA, NS1 LISA, Trend.

Introduction:

Dengue, also called classic dengue or 'Break Bone Fever', is a Flaviviral infection found in large areas of tropical and subtropical regions [1], is potentially fatal. Chikungunya Virus belongs to the genus Alphavirus of Togaviridae. Dengue virus (DENV) and Chikungunya virus (CHIKV) are transmitted by the same species of mosquito, *Aedes aegypti*. [2]

Dengue fever is a major public health problem in India [7] and is widespread and endemic in most major cities [3]. Dengue outbreaks have continued since the 1950s 881 but severity of disease has increased in the last two decades. Chikungunya on the other hand is having outbreaks since 2006 after a gap of three decades and cases a seen more frequently after the year 2010. [4]

The clinical symptoms of dengue, caused by any of the four serotypes of DENV, may be mild as like fever, or severe, in the form Dengue hemorrhagic fever (DHF) and Dengue shock syndrome (DSS). Increased rates of hospitalization due to severe dengue, during outbreaks, leads to huge economic loss and strained health services. There is no specific antiviral therapy and treatment is only supportive. [5] Also, the rise in urbanisation, population explosion has additional effect on causing rise in seropositivity. [6] Resurgence of chikungunya has been attributed to various factors including globalization, increase in the mosquito population, loss of herd immunity and the mutation A226V in the E1 gene causing a significant increase in CHIKV infectivity for *Ae. Albopicust.*In the absence of specific antiviral therapy, control of transmission of Dengue and Chikungunya virus by vector management is the sole method available for decreasing associated morbidity. [8] The main aim and objectives of this study includes, to detect the seropositivity of Dengue and Chikungunya based on ELISA and to study the regional, seasonal, gender and admission pattern related trend of Dengue and Chikungunya.

Materials and Methods

This Study was conducted at Shree M.P. Shah Medical College, Jamnagar, Gujarat, India.

Study population: Samples received from clinically suspected patients of Dengue and Chikungunya from GGGH and peripheral PHC's.

Study period: July 2015 to May 2016

Sample size :

a) 604 for Dengue ELISA only.

b) 162 for Chikungunya ELISA only.

c) 42 samples that were clinically suspected for both Dengue and Chikungunya were tested.

Dengue NS1 ELISA was done in fever less than 5 days**2** while Dengue IgM ELISA was done in fever more than 5 days. IgM ELISA were performed in all Chikungunya suspected cases.

Kits used: J.Mitra, New Delhi for NS1 and kits from National Institute of Virology (NIV) Pune for Dengue and Chikungunya IgM ELISA

Results and Discussion

Total Dengue samples: 604

Positive for Dengue: 95

70 patients were positive for NS1 ELISA (19%) and 25 patients were positive for IgM ELISA(11%)thus indicating that fever less than 5 days showed more seropositivity.

Total samples for Chikungunya: 162

Positive For Chikungunya by IgM ELISA: 40 (seropositivity of 25%)

42 samples were tested for both Dengue and Chikungunya ELISA of which 12 samples were positive for Chikungunya

Co-Infection: seen in a single patient

Symptomatically; Dengue showed more symptoms of fever and Rash while Chikungunya patients showed more symptoms of Joint pain, Bodyache and Headache. 50 cases (52.6%)of Dengue Patients & 6 cases (15%) Chikungunya patients had Platelet count less than 1 lakhs. Chikungunya showed and uniformly month wise increasing trend from August with maximum cases in December.

Male: Female ratio for Chikungunya was 1:1.6 while Male:Female ratio for Dengue was 2:1 Jamnagar showed more cases of

Dengue while periheral areas showed more cases of Chikungunya. 80% serpositive cases for Dengue ELISA were needed to be managed on IPD basis while only 25% cases were managed on IPD basis For Chikungunya thus indicating that Dengue showed more severe pattern as compared to Chikungunya.

Table 1: Shows Month wise percentage seropositivity of Chikungunya

Month	Total	Positive	Negative	% Positivity
Jun-15	0	0	0	0
Jul-15	0	0	0	0
Aug-15	36	3	33	8.33
Sep-15	20	5	15	25
Oct-15	40	10	30	25
Nov-15	20	6	14	30
Dec-15	36	13	23	36.11
Jan-16	6	2	4	33.33
Feb-16	4	1	3	25
Mar-16	0	0	0	0
Apr-16	0	0	0	0
May-16	2	0	2	0
TOTAL	162	40	122	24.6

Shows positive cases and percentage seropositivity of Dengue NS1 ELISA and Dengue IgM ELISA

Table 2:

Month	Tested for IgM	IgM ELISA Positive cases	% Positivity	Tested For NS1 ELISA	NS1 ELISA Positive cases	% Positivity
Jun-15	2	0	0	8	2	25
Jul-15	5	0	0	11	4	36.36
Aug-15	8	3	37.5	92	12	13.04
Sep-15	60	5	8.33	100	15	15
Oct-15	30	1	3.33	72	24	33.33
Nov-15	13	4	30.76	30	10	33.33
Dec-15	40	9	22.5	38	3	7.89
Jan-16	12	1	8.33	5	0	0
Feb-16	31	1	3.22	12	0	0
Mar-16	14	1	7.14	2	0	0
Apr-16	2	0	0	2	0	0
May-16	13	0	0	2	0	0
TOTAL	**230**	**25**	**10.86**	**374**	**70**	**18.71**

Comparison of Chikungunya and Dengue Positive cases in terms of various Characteristics e.g : Sex, Region, Admission pattern & Symptoms

Total Samples Tested For Dengue = 604 **Table.3**		**Total Positive Samples For Dengue = 95**		
	Chikungunya	**%Positivity**	Dengue	**% Positivity**
Male	15	37.5	63	66.31
Female	25	62.5	32	33.68
JAMNAGAR city	11	27.5	83	87.36
Periphary(PHC)	29	72.5	12	12.63
Opd	30	75	19	20
Ward	10	25	76	80
Fever	37	92.5	95	100
Joint pain	36	90	45	47.36
Bodyache	37	92.5	76	80
Headache	9	22.5	20	21.05
Rash	4	10	22	23.15
Platelet Count	>1 lakhs(34)	85	>1 lakhs(45)	47.36
	<1 lakhs(06)	15	<1 lakhs (50)	52.63

Conclusion

It is shown that the titres of NS1 represent the viral load and the viral load is directly proportional to complication. Hence, inclusion of NS1 in the ELISA test format must be present for evaluation, whether patient is from endemic or non-endemic areas. 42 samples were tested for both Chikungunya and Dengue. Out of which 12 samples were positive for Chikungunya and a single patient showed presence of both the infections. This suggests that patient suspicious for Chikungunya must be tested for Dengue as well and vice versa, for knowing actual infection incidence. Vector control is of utmost importance to reduce the impact of these diseases as no vaccines and specific antiviral treatment is present as of now. Apart from this mass education with regards to proper sanitation, proper disposal of water and early presentation to outpatient department without delaying treatment, must be made.

References

1. Pialoux G, *et al.* Chikungunya: an epidemic arbovirosis. Lancet Infect. Dis. 2007; 7:319–327.
2. Whitehorn J, Simmons CP. The pathogenesis of dengue. Vaccine. 2011; 29:72218.
3. Libraty DH, *et al*. High Circulating Levels of the Dengue Virus Nonstructural Protein NS1 Early in Dengue Illness Correlate with the Development of Dengue Hemorrhagic Fever. J Infect Dis. 2002; 186:11658.
4. World Health Organization. 2009. Dengue: Guidelines for Diagnosis, Treatment, Prevention and Control. New edition. Geneva: World Health Organization;
5. National Vector Borne Disease Control Programme. Dengue/ dengue haemorrhagic fever. 2013. http://www.nhp.gov.in/nvbdcp - accessed 16 March 2014.
6. World Health Organization. 2009. Dengue: Guidelines for Diagnosis, Treatment, Prevention and Control. New edition. Geneva: World Health Organization.
7. Chaturvedi UC, Shrivastava R 2004; Dengue haemorrhagic fever: A global challenge. *Indian J Med Microbiol. 2004;* 22 :56