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RESEARCH ARTICLE

SERO-PREVALENCE OF DENGUE INFECTION FROM GOVERNMENT HOSPITAL, RAJASTHAN DURING 2022

Dr. Rajkumari Bajaj

Pathologist at Shri RKJ Hospital, Dausa (Rajasthan).

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Abstract

Background: Viral haemorrhagic fevers are becoming increasingly common in the tropics and subtropics. Dengue fever is currently the most important arthropod-borne viral disease because of its widespread distribution in more than 100 countries and its potential for extensive outbreaks of life-threatening disease.

Material and Methods: This study was a hospital-based cross-sectional study conducted in Laboratory Shri. R.K.J. Hospital, Dausa, in Rajasthan, India, between January 2022 to December 2022. The present study included all serum specimens received at laboratory of R.K.J. Hospital, Dausa, from clinically suspected cases of dengue infection, during this duration. Serum samples were received for serological testing from suspected cases of dengue as advised by consultants from various departments in hospital for laboratory confirmation of suspected cases. Laboratory-confirmed dengue cases were defined as suspected dengue cases with positive dengue serology.

Result: The present study analyzed the samples of 1880 of suspected patients during year of 2022. and seropositivity rate of 15% (296/1880) was found out of which 10% (67/648) were seropositive for NS1 antigen and 18% (229/1232) were by IgM ELISA test. The present study revealed trend of cases from August to December 2022; peak of cases was reported in month of September and November.

Discussion: The resurgence of dengue has been notable in India and dengue epidemics have been frequently reported in the country both from urban and rural regions. Recent analysis of the past two decades highlighted that, in India, transmission pattern of dengue has changed and widened with shift in peak post-monsoon; shifting toward November from October in the recent decade from irregular peak of the previous decade. However, the present pattern in shift of transmission is clear that dengue cannot be considered as a seasonal disease.

Conclusions: An alarming rate of increasing emerging and reemerging trends of these arboviral infections are noted in this part of Rajasthan. Hence, the need to focus on proper surveillance, and implementation of prevention and control measure in the country are of utmost priority. Presently, there are no licensed vaccines or antivirals available; however, India has initiated several efforts in this direction including traditional medicines. The outcome of this study will help in focusing and improvement of existing surveillance systems and vector control

Corresponding Author:- Dr. Rajkumari Bajaj

Address:- Pathologist at Shri RKJ Hospital, Dausa (Rajasthan).

tools, as well as on the development of suitable antiviral agents and formulating candidate vaccine.

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Introduction:-

Dengue, a mosquito borne viral disease, has emerged as a significant threat and burden to public health systems in tropical and sub tropical countries. Dengue fever, commonly known as Break Bone Fever is a deadly arboviral disease caused by four different serotypes of dengue virus, DENV-1, DENV-2, DENV-3, and DENV-4.[1,2,3] It is a vector-borne disease transmitted by various species of day-biting Aedes mosquito and mainly affects the tropical and subtropical regions of the world. Dengue virus is an RNA virus belonging to the family Flaviviridae and genus Flavivirus.[4,5] The incidence of dengue has increased dramatically over the past five decades with 50–100 million infections occurring annually. The outcome of the infection ranges from sub clinical infection, mild dengue to severe forms of dengue which occasionally are life-threatening if not clinically managed properly. Globally, each year 390 million people are infected with dengue of which 96 million people have clinical disease.[6–11]. This study aimed to study the prevalence of dengue infections, to evaluate the seropositivity in tertiary care setup, thereby to create awareness about the preventive measures to be taken by the general public and the healthcare system, and to improve our infrastructure for diagnosing and treating dengue infections.

Material and Methods:-

All samples coming to pathology Department for suspected dengue infection were included in the study. All samples were tested as per standard laboratory protocol and availability of kit. All clinically suspected samples were tested by dengue nonstructural protein 1 (NS1) antigen and/or IgG or IgM antibody detection as per manufacturer's instruction.

Study population:

This study was conducted in the Laboratory of Shri. R.K.J. Hospital, Dausa, Rajasthan, India, between January 2022 to December 2022..

The present study included all serum specimens received at laboratory of R.K.J. Hospital, Dausa, from clinically suspected cases of dengue infection, during this duration. Serum samples were received for serological testing from suspected cases of dengue as advised by consultants from various departments in hospital for laboratory confirmation of suspected cases. Laboratory-confirmed dengue cases were defined as suspected dengue cases with positive dengue serology.

Serology (diagnosis of dengue infection)

For diagnosis of dengue infection, serum samples were tested to detect dengue NS1 antigen or dengue IgM antibodies in the microbiology laboratory of the hospital. Detection of at least one component (NS1 or IgM antibodies) was positive for serodiagnosis. Serum samples from clinically suspected patients having a history of fever for ≤ 5 days were tested for NS1 antigen while those having fever for more than 5 days were tested for dengue-specific IgM antibodies by using IgM antibody capture enzyme-linked immunosorbent assay kit.

Result:-

Total 1880 samples were received from Suspected dengue patients out of which 648 samples were requested for IgM testing and 1232 samples were requested for NS1 testing. As shown in diagram 1 and 2 respectively, out of 648 samples, 67(10%) were positive for IgM and 229 (18%) were positive for NS1 testing. Month wise analysis of dengue testing and positivity as shown in diagram 3, maximum samples received from dengue suspected patients for Ig M testing were during March to June 2022 and during October to December 2022 and maximum positive samples were obtained during October to December 2022. Month wise analysis of dengue testing and positivity as shown in diagram 4, maximum samples received from dengue suspected patients for NS1 testing were during July to December 2022 and maximum positive samples were obtained during October to December 2022.

Diagram 1:- Total number of samples tested, positive and negative for Dengue IgM in 2022.

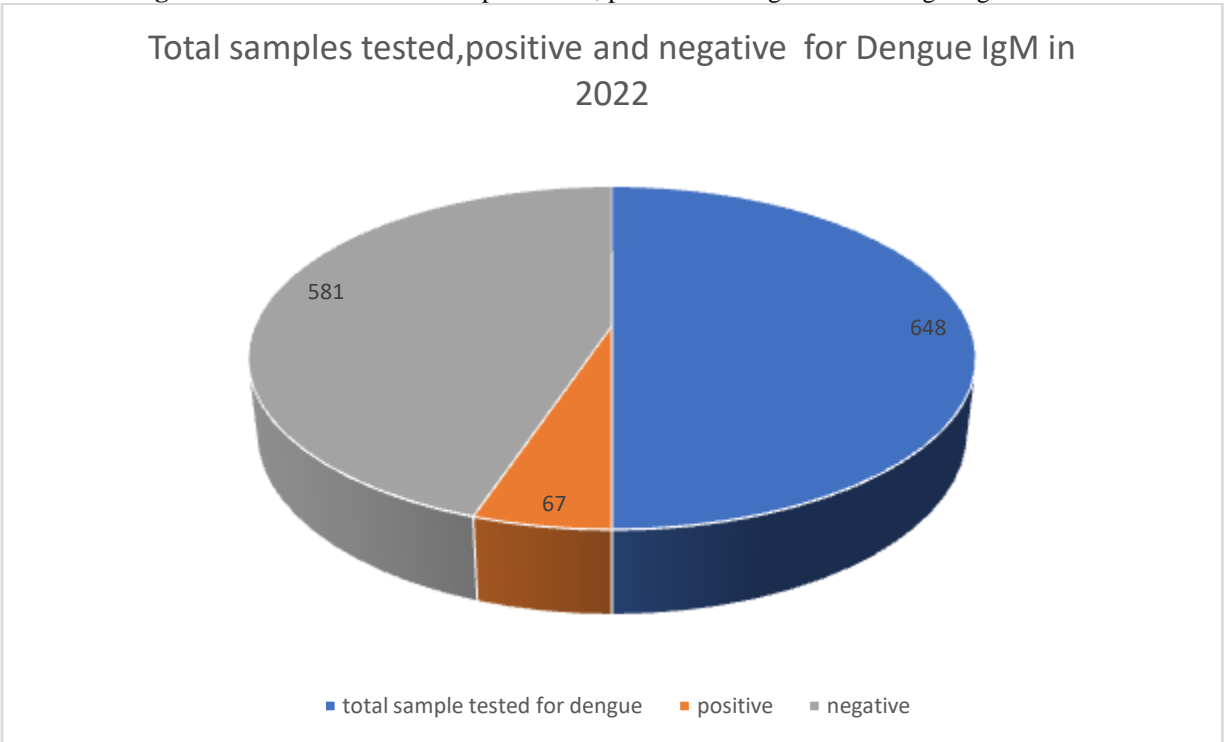


Diagram 2:- Total number of samples tested, positive and negative for Dengue NS1 in 2022.

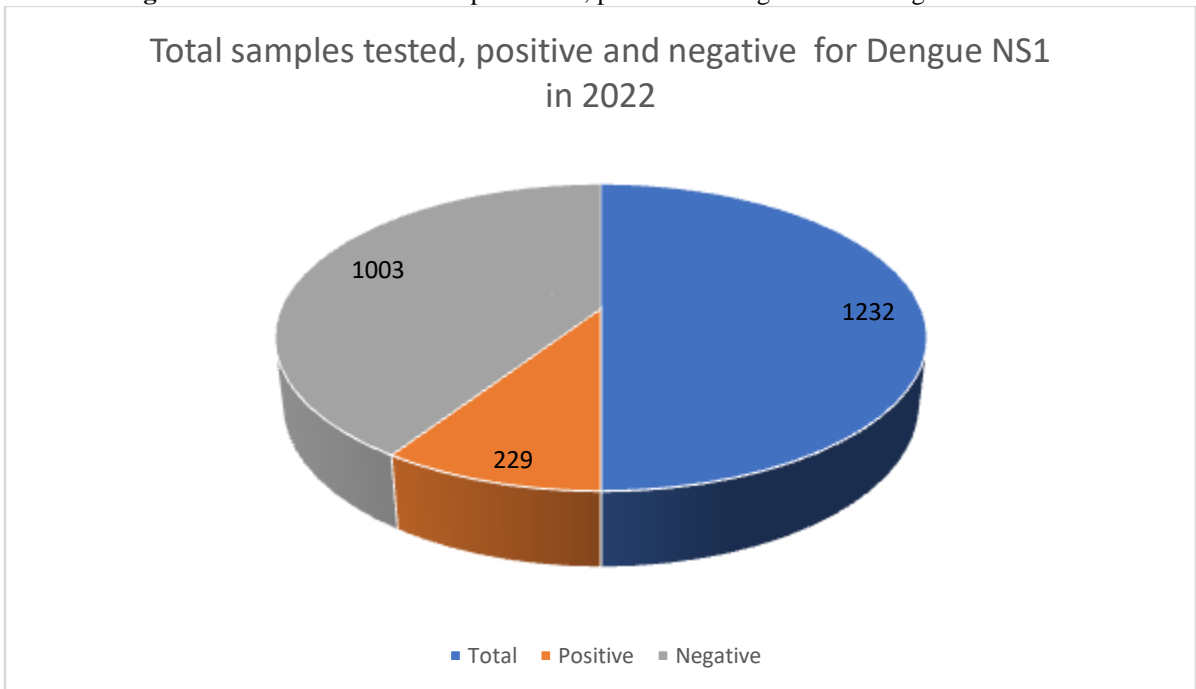


Diagram 3:- Month wise trend of Dengue IgM testing and positivity.

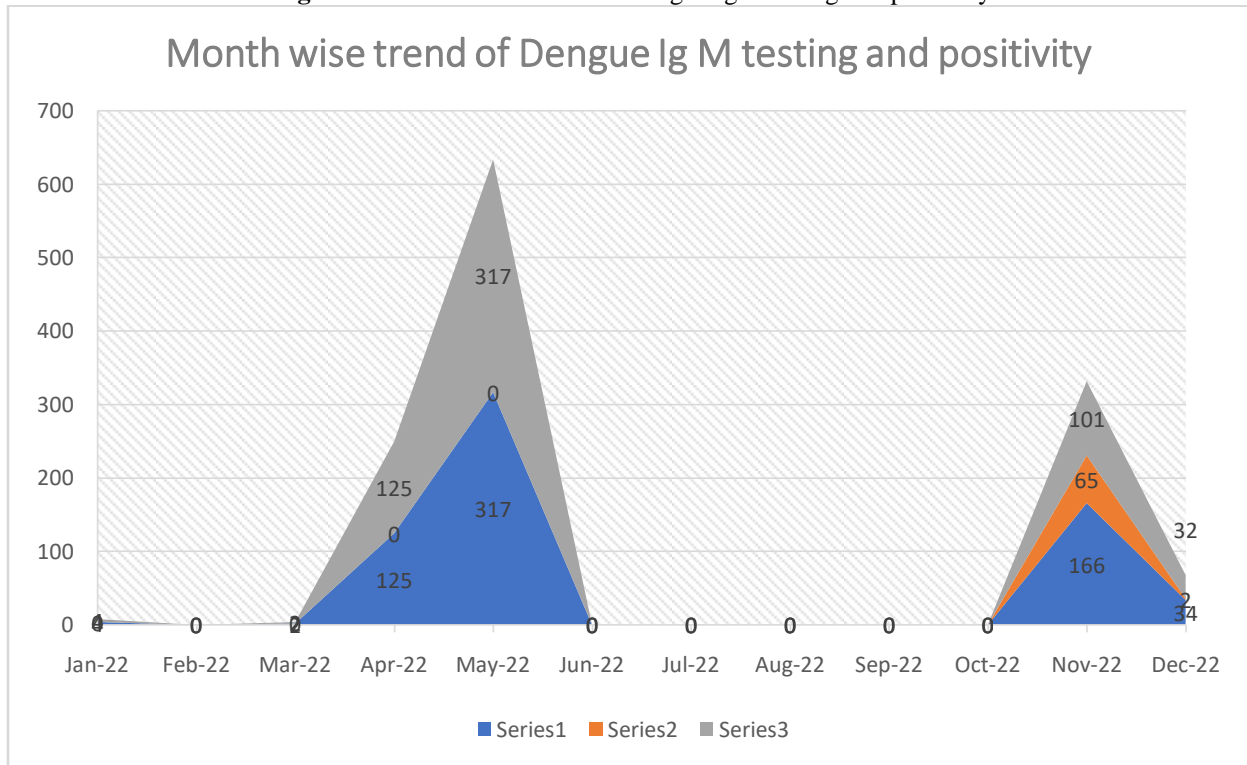
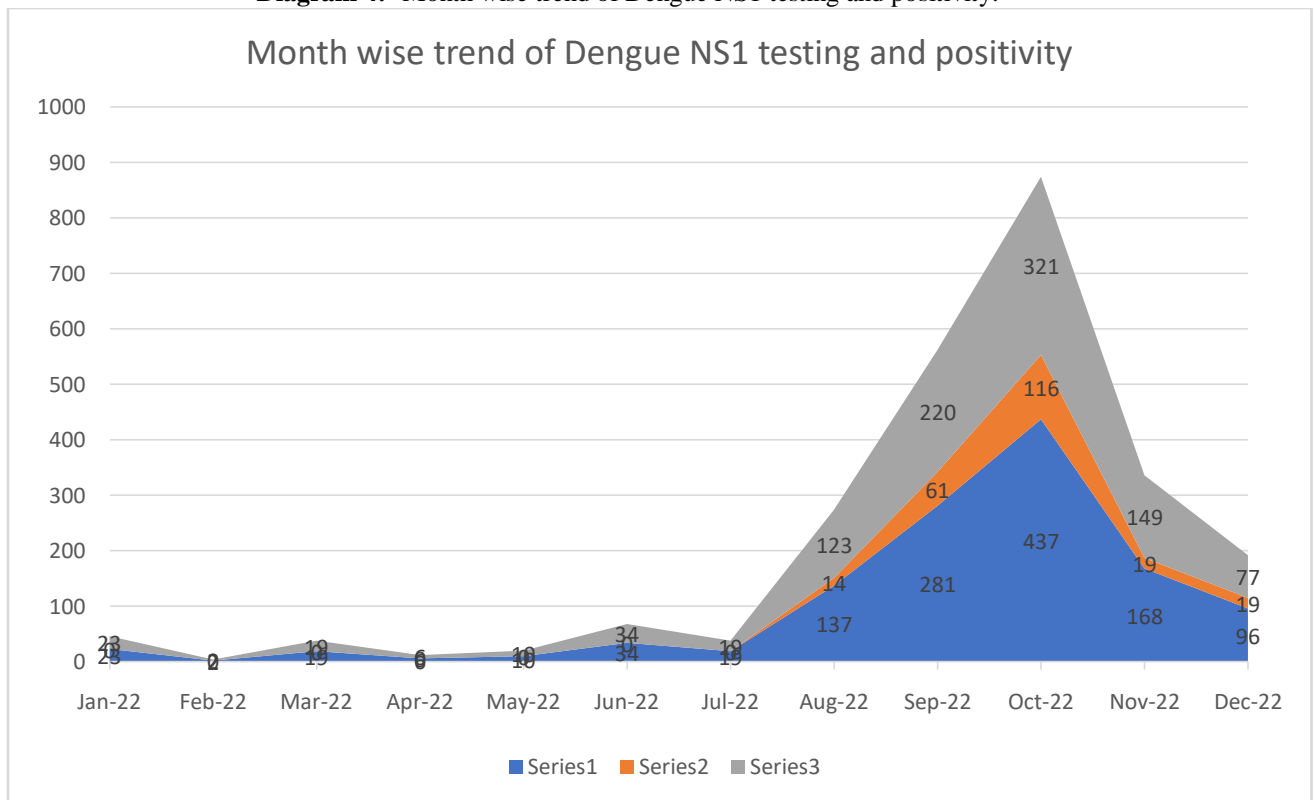


Diagram 4:- Month wise trend of Dengue NS1 testing and positivity.



Discussion:-

The resurgence of dengue has been notable in India and dengue epidemics have been frequently reported in the country both from urban and rural regions.[8]The present study analyzed the samples of 1880 of suspected patients during year of 2022. and seropositivity rate of 15% (296/1880) was found out of which 10% (67/648) were seropositive for NS1 antigen and 18% (229/1232) were by IgM ELISA test. Similar estimates of the prevalence of laboratory-confirmed dengue infection were reported in the surveillance data (2014–2017) from 52 laboratories.[9-13]

The present study revealed trend of cases from August to December 2022; peak of cases was reported in month of September and November. Most researchers reported maximum cases during September–November.[14,15]Dengue positivity was higher between the months of October and November. Recent analysis of the past two decades highlighted that, in India, transmission pattern of dengue has changed and widened with shift in peak post-monsoon; shifting toward November from October in the recent decade from irregular peak of the previous decade. However, the present pattern in shift of transmission is clearly evident that dengue cannot be considered as a seasonal disease.[14-15]

Conclusions:-

An alarming rate of increasing emerging and reemerging trends of these arboviral infections are noted in this part of Rajasthan.

Hence, the need to focus on proper surveillance, and implementation of prevention and control measure in the country are of utmost priority. Presently, there are no licensed vaccines or antivirals available; however, India has initiated several efforts in this direction including traditional medicines. In this review, we present the current status of dengue and chikungunya fever in .

The outcome of this study will help in focusing and improvement of existing surveillance systems and vector control tools, as well as on the development of suitable antiviral agents and formulating candidate vaccine

Limitations of the study

Serotype was not analysed because of resource constraint.

Conflicts of interest

There are no conflicts of interest.

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