Original Research Article

One Year Retrospective Study of Dengue Cases in Bharatpur (Rajasthan)

Dr. Avinash Pandey[1*], Dr. Sunita Pande[2]

[1]Associate Professor Pathology, Govt. Medical College, Rajasthan India
[2]Associate Professor, Zoology, Govt. M.S.J. College, Bharatpur Rajasthan India

Abstract

Over 150 countries with around 500 million people suffer mosquito borne diseases every year resulting in approximately one million deaths. Around 40 million people in India contract mosquito borne diseases annually. Mosquitoes are responsible for causing illnesses such as malaria, filarial, dengue, chikungunya, yellow fever etc. If not detected in time, these diseases can turn out to be deadly. Dengue virus causes dengue. Incubation of the disease is 3-14 days. The disease is characterized by headache, high fever, joint pains, and skin rashes and vomiting. Recovery period may be upto 7 days. A severe form of the disease, dengue haemorrhagic fever shows symptoms such as bleeding from capillaries under the skin and vomiting. Dengue virus is a single stranded RNA arbovirus and resembles chikungunya and zika virus. It is an arthropod borne disease caused by four serotypes of the virus. During recent years an increase in the number of cases of dengue has been noticed. The present study was carried out in the central laboratory of Govt. Medical College, Bharatpur, and Rajasthan. The purpose of the study was to determine seropositivity, seasonal variation and clinical profile of the disease during the period January to December, 2019. Serum was separated from the blood samples of 997 patients with Dengue like illness. The samples were tested for Dengue NS 1 antigen and IgM antibody ELISA. On testing by ELISA it was found that 102 out of 647 (15.7%)samples were positive for NS 1 antigen and out of 350, 78 (22.2%) were tested positive for IgM antibody (Table 1). It was found that total prevalence of dengue in Bharatpur was 18%. It was also seen that out of the total number of 997 fever cases, maximum were in the age group 1-30 years. Rainy season (August to November) showed the maximum number of cases with the peak in October.
Keywords: Denue, ELISA, Seropositivity.

INTRODUCTION

Dengue is an acute viral infection with potential fatal complications. Dengue fever was first referred as "water poison" associated with flying insects in a Chinese medical encyclopedia. The first clinically recognized dengue epidemics occurred almost simultaneously in Asia, Africa, and North America in the 1780s. Benjamin Rush, coined the term "break bone fever" for dengue because of the symptoms of myalgia and arthralgia. A single stranded enveloped RNA virus of family Flaviviridae and Genus Flavivirus is the causative agent of Dengue [1]. Any one of the four antigenically related serotypes: DENV-1, DENV-2, DENV-3 and DENV-4 cause Dengue [2]. Upsurge worldwide between 1960 to 2018 due to increased population, unplanned urbanization, inefficient mosquito control, global warming, lack of health care facilities and frequent air travel [3-5]. Almost two and a half billion people reside in Dengue endemic regions [5]. The first reported case of Dengue in India was in 1780 whereas the first virologically proven epidemic of Dengue in India occurred in Calcutta in 1963-64 [8].

MATERIAL AND METHODS

A total of 997 blood samples from clinically suspected Dengue patients attending government Medical college and attached hospital during the period January to December 2019 were tested at the central lab of Bharatpur District Hospital. Age group of patients was between 1-75 years of age and the distribution is given in Table 2. Persons presenting with a history of fever of less than five days were tested for NS 1 antigen whereas those with fever of more than 5 days were tested for IgM antibody. These tests were done by ELISA technique. Serum was separated from collected blood samples as per standard guidelines [8, 9]. ELISA kit used was manufactured by J. Mitra & Co. Pvt. Ltd. The tests were performed according to manufacturer's instructions. NS 1 antigen tests are based upon the principle of "Direct Sandwich"ELISA. The IgM

antibody tests are based upon the principle of "MAC Capture"ELISA.

RESULTS

Out of the total 997 serum samples, 647 were tested for NS 1 Antigen ELISA and the rest 350 samples were tested for IgM antibody ELISA. 102 (15.7%) samples were positive for NS 1 antigen. 78 (22.2%) samples were positive for IgM antibody ELISA (Table 1). The total prevalence of Dengue was 180/997 (18%) in Bharatpur district of Rajasthan.

Table 1: Positivity of Dengue by NS 1 antigen and IgM antibody ELISA

Results	NS 1 Antigen ELISA (n=647) (%)	IgM Antibody ELISA (n= 350) (%)
Positive	102 (15.7%)	78 (22.2%)
Negative	545(84.3%)	272 (77.8%)
Total	647 (66.2%)	350 (33.8%)

Table-2: Age wise distribution of patient samples collected in the study

Age (Years)	Number of Patients
1-10	138
11-20	201
21-30	358
31-40	115
41-50	74
51-60	51
61-70	45
71-80	15
Total	997

Table-3: Month wise distribution of Dengue ELISA positive cases

Month and Year	Positive cases by ELISA
January	04
February	07
March	11
April	09
May	14
June	11
July	14
August	22
September	26
October	34
November	21
December	07
Total	180

DISCUSSION

In the present study, out of 997 suspected cases 102 (10.2%) were found positive for Dengue NS 1 antigen and 78 (7.8%) patients were positive for Dengue IgM antibody. Overall prevalence of Dengue positive patients was found to be 180/997 (18%). Sood S reports 19% seroprevalence of Dengue in Rajasthan [9] which is closely related to our study. Ukey PM *et al.* Reported higher seroprevalence of 31.3% in central India.

In the present study out of 180 positive cases maximum positivity was found in 21-30 age groups. This was comparable to other studies of Gore MM, Baruah [13] and Dash PK *et al.* [14].

CONCLUSION

Total number of Dengue cases in Bharatpur showed a gradual increase from August to October. The total number of positive cases started increasing in August, peaked in October and slowly tapered in December. The prevalence of positive cases of Dengue was more in 21-30 age group.

REFERENCES
1. Naeem-Ullah, U., & Akram, W. (2009). Dengue knowledge, attitudes and practices in Multan, Pakistan: an urban area at the verge of dengue infestation. *Public Health*, *123*(6), 452-453.
2. Chakravarti, A., Kumaria, R., Berry, N., & Sharma, V. K. (2002). Serodiagnosis of Dengue Infection

by Rapid Immunochromatography Test in a Hospital Setting in Delhi, India, 1999-2001.

3. Gubler, D. J. Dengue and dengue hemorrhagic fever. Clin Microbial Rev.[Internet]. 1998 [citado 13 de 2015]; 11 (3): 480–96.

4. World Health Organization, Special Programme for Research, Training in Tropical Diseases, World Health Organization. Department of Control of Neglected Tropical Diseases, World Health Organization. Epidemic, & Pandemic Alert. (2009). *Dengue: guidelines for diagnosis, treatment, prevention and control*. World Health Organization.

5. Guzman, M. G., Halstead, S. B., Artsob, H., Buchy, P., Farrar, J., Gubler, D. J., ... & Peeling, R. W. (2010). Dengue: a continuing global threat. *Nature reviews microbiology*, *8*(12), S7-S16.

6. Linares, E. M., Pannuti, C. S., Kubota, L. T., & Thalhammer, S. (2013). Immunospot assay based on fluorescent nanoparticles for Dengue fever detection. *Biosensors and Bioelectronics*, *41*, 180-185.

7. San Martín, J. L., Brathwaite, O., Zambrano, B., Solórzano, J. O., Bouckenooghe, A., Dayan, G. H., & Guzmán, M. G. (2010). The epidemiology of dengue in the Americas over the last three decades: a worrisome reality. *The American journal of tropical medicine and hygiene*, *82*(1), 128-135.

8. Gupta, N., Srivastava, S., Jain, A., & Chaturvedi, U. C. (2012). Dengue in India. *The Indian journal of medical research*, *136*(3), 373.

9. Thomas, E. A., John, M., & Bhatia, A. (2007). Cutaneous manifestations of dengue viral infection in Punjab (north India). *International journal of dermatology*, *46*(7), 715-719.

10. Sood, S. (2013). A hospital based serosurveillance study of dengue infection in Jaipur (Rajasthan), India. *Journal of clinical and diagnostic research: JCDR*, *7*(9), 1917.