Narayan Shrihari and Krishna S. / *International Journal of Preclinical & Pharmaceutical Research.* 2014; 5(2): 100-102.

e-ISSN 2249-7552
Print ISSN 2229-7502

International Journal of
Preclinical & Pharmaceutical Research

Journal homepage: www.preclinicaljournal.com

DETECTION OF NS1 ANTIGEN AND ANTIBODY AGAINST DENGUE ARBOVIRUS INFECTION BY RAPID TEST AND ELISA AT A TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Rapid diagnosis of Dengue arbovirus infection is essential for the patient management. The rapid immunochromatographic test and capture enzyme linked immunosorbant assay (Mac ELISA) for dengue NS1 antigen and antibody respectively. Both the tests are giving accurate result. Objective: To evaluate and compare rapid immunochromatographic test and capture enzyme linked immunosorbant assay for dengue arbovirus infection. Material and Methods: The laboratory records of clinically suspected dengue patients from January to December 2013were analyzed retrospectively and results of NS1 antigen and Ig M anti dengue antibody tested by rapid immunochromatographic test and Ig M capture enzyme linked immunosorbant assay (Mac ELISA) respectively and we compared the accuracy of both the tests. Both the rapid and ELISA tests were performed by following the manufacturer's instructions. Result: Both assays showed excellent sensitivity. The rapid test detected NS1 antigen and 385 serum samples were positive out of 2632(14.63%). ELISA test detected Ig M antibody and 613 serum samples were positive out of 3409(17.98%). The present study emphasizes the continuous sero-epidemiological surveillance for the effective dengue arboviral infection control programme. Conclusion: These tests should be a useful aid in confirming the clinical diagnosis of dengue arbovirus infection. The rapid test will be particularly valuable in peripheral health setting while the ELISA has a place in central testing laboratories.

Key Words: Dengue infection, Immunochromatographic test and Ig M capture enzyme linked immunosorbant assay (Mac ELISA).

INTRODUCTION

The arboviruses are transmitted by blood sucking arthropods from one vertebrate host to another. The vector acquires a lifelong infection through the ingestion of blood from a viremic vertebrate host. The viruses multiply in the tissues of the arthropod without evidence of disease or damage. Some arboviruses are maintained in nature by transovarian transmission in arthropods [Figure No: 1]. The major arboviral diseases distributed worldwide are yellow fever, dengue, japanese B encephalitis, chikungunya, St. Louis encephalitis, western equine encephalitis, eastern equine encephalitis, russian spring summer encephalitis, westnile fever and sand fly fever [1]. The dengue is a flue like viral disease characterized by fever, rash, muscle and joint pain. It is spread by the bite of infected Aedes mosquitoes [2]. The vector-borne disease and mosquitoes breeding sites are playing an important role in the transmission and propagation of dengue.

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MATERIAL AND METHODS

The study was conducted at a tertiary care Hospital from January to December 2013. Serum samples from suspected dengue cases were included in our study. Aseptic precautions, two to five ml of blood samples were collected by venipuncture from dengue suspected cases and samples were transported to the Microbiology laboratory in vaccine carriers with duly filled requisition forms. The serum was separated by centrifugation of the whole blood sample and stored in the refrigerator at -20^{o}C

[3,4]. The test kits used were Dengue Day1 rapid immunochromatographic test by J Mitra and Co. Pvt Ltd Okhla Ind area Ph-1, New Delhi, India and Dengue Ig M antibody capture ELISA supplied by Group leader, Arbovirus Diagnostics, National Institute of Virology, Pune, India. The tests were performed strictly as per the manufacturers' instructions.

RESULTS

During one year of study period, 2632 dengue suspected serum samples were analyzed by dengue NS1 rapid immunochromatographic test, out of these 385 (14.63%) samples were positive for dengue NS1 antigen [Table No:1].

Similarly 3409 dengue suspected serum samples were analyzed by dengue Ig M capture enzyme linked immunosorbant assay, out of these 613(17.98%) samples were positive for dengue IgM antibody [Table No: 2]. The percentage of positivity is more in ELISA as compared to Rapid test.

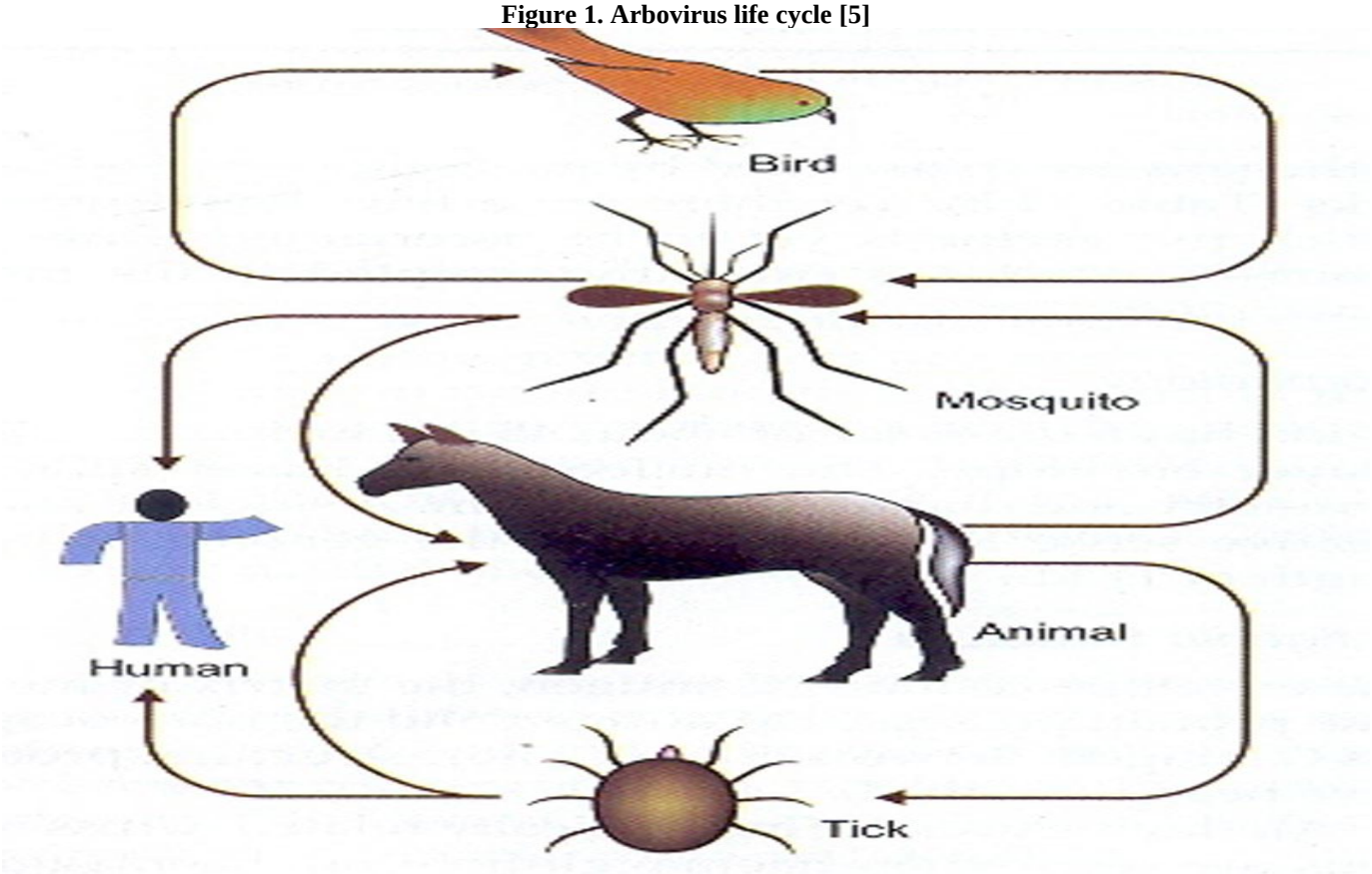
Table 1. Dengue NS1 Rapid Immunochromatographic test

Samples Tested	Positive	Percentage	Negative
2632	385	14.63	2247

Table 2. Dengue Ig M Capture enzyme linked immunosorbant assay

Samples Tested	Positive	Percentage	Negative
3409	613	17.98	2796

Figure 1. Arbovirus life cycle [5]



DISCUSSION

During an epidemic diagnosis of dengue fever is essential for proper management of the patients. Clinically the dengue virus infection may remain asymptomatic or become symptomatic as dengue fever, dengue hemorrhagic fever or dengue shock syndrome [6]. The relatively benign dengue fever present with high grade fever accompanied by headache, retrobulbar pain, muscle& bone pain and generalized peticheal rash [7]. Several studies have compared different immunoassay methods to detect Ig M dengue antibody including ELISA, dot ELISA, dip stick assay, dot blot assay and immunochromatographic test devices [8,9]. Some studies have tested the diagnostic

accuracy of various commercially available dengue NS1 antigen capture assay [10].

CONCLUSION

The arboviral infections mainly dengue, chikungunya and Japanese B Encephalitis are most common in tropical and subtropical regions. The vector (mosquitoes) control is important preventive measure in community. The results of our study is important in diagnosing dengue infection as early as possible by rapid immunochromatographic test detecting NS1 antigen and further confirmed by Ig M antibody of dengue by Mac ELISA. The serological results (Rapid immune chromatographic and Ig M antibody capture ELISA tests) clearly establish the etiology.

Key message: The prevention is better than cure.

REFERENCES

1. Jawetz, Melnick, Adelberg. Arthropod borne and Rodent borne viral diseases In, Medical Microbiology, Chapter 38, 23rd edition, Singapore, The Mc Graw Hill Companies, 2004, 514.
2. Anuradha SK, Surekha YA, Sathyanarayan MS, Suresh S, Krishna S, Satish SP, Mariraj J, Ravikumar R. Japanese Encephalitis virus, common cause of viral encephalitis in paediatric age group in Bellary, Karnataka, India. *Journal of Clinical and Diagnostic Research*, 5(3), 2011, 480-482.
3. Noshin WY, Naeem K, Roheena A, Nasir I. Comparison of diagnostic devices for Dengue virus infection-A pilot study. *Journal Ayub Med Coll Abbottabad*, 20(4), 2008, 26-28.
4. Branch SL, Levett PN. Evaluation of four methods for detection of Ig M antibodies to Dengue virus. *Clinical Diagnosis Laboratory immunology*, 6, 1999, 555-557.
5. Groen J, Korak P, Veizing J, Copra C, Osterhours AD. Evaluation of six immunoassays for detection of dengue virus specific IgM and Ig G antibodies. *Clinical Diagnosis Laboratory Immunology*, 7, 2000, 867-871.
6. Monique RQL, Rita MRN, Hermann GS, Flavia BS. Comparison of Three Commercially available Dengue NS1 antigen capture assay for acute diagnosis of Dengue in Brazil. *PLOS Neglected Tropical Diseases*, 4(7), 2010, 1-8.
7. Bhatia R, Ichhpujani RL. Arboviruses In, Essentials of Medical Microbiology, Chapter 74, 4th Edition, New Delhi, Jaypee Brothers Medical Publishers, 2008, 401.