EPIDEMIOLOGY AND IMMUNO-MOLECULAR STATUS OF NEPAL DENGUE OUTBREAK

Authors: Mahesh Lamsal[a], Anmol Chandele[b], Sujan Shresta[c], Murali Krishna Kaja[b], Birendra Prasad Gupta[a], Krishna Das Manandhar[a],

Authors' Addresses:

a. Central Department of Biotechnology, Tribhuvan University, Kirtipur Kathmandu Nepal

b. ICGEB-Emory Vaccine Centre, International Centre for Genetic Engineering and Biotechnology, Aruna Asaf Ali Marg, New Delhi, India

c. La Jolla Institute for Allergy and Immunology, La Jolla, California, USA

ABSTRACT

Background: The emergence and circulation of dengue infection has become one of the major public health concerns in the world with its high prevalence in the tropical and sub-tropical countries. Hundreds of Dengue cases have been reported annually and the shift of serotypes in every year has raised to the concern of public health in Nepal. The detection of dengue virus infections has great importance for the clinical management of patients, surveillance, and clinical trial assessments in the days to come.

Objective: Study of the clinically suspected febrile cases for Dengue virus and their confirmation by using immunological and molecular techniques.

Study Design: 240 clinically suspected Dengue cases were subjected to Dengue IgM, IgG and NS1 capture ELISA followed by IgG end-point ELISA. Viral RNA extraction was performed for all samples using Qiagen kit. cDNA was prepared, and RT-PCR was performed using D1 and DencomR2 primers. Dengue Serotyping was done for PCR positive samples using gene specific primers.

Results: Out of 240 dengue suspected cases, 153(63.75%) were males and 87(36.25%) were female. 6.25% of the patients were below 10 years of age. 59.16 % of the samples showed NS1 positive, 33% IgM positive and only 7.9 % IgG positive. Only 14 samples showed positive result for all NS1, IgM and IgG ELISA. Most of the cases were found to be of primary infection. Antibody level for each serum was calculated and categorised as high (43228.70), medium and low (953.53). Only 35.83 % of the suspected cases were confirmed positive for dengue virus by PCR. Dengue Serotype-1 was found to be circulating in the year 2016 in Nepal.

Conclusion: Only 35.83% of the clinically suspected cases were confirmed for Dengue virus infection. This implies that confirmatory tests like PCR should be coupled with the ELISA results for the proper diagnosis and management of the disease.

Key Words: Dengue virus, RT-PCR, ELISA, emergence, Serotyping