

Clinical, Demographic and Molecular Characterization of Dengue, Chikungunya and Zika Viruses Causing Hemorrhagic Fever in North India

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Abstract : Introduction: Arboviral diseases are one of the most common causes of viral hemorrhagic fever (VHF). Of which, Dengue and Chikungunya pose a significant health problem in India. Arbovirus has a tendency to cross the territories and emerge in the new region. Considering the above issues, in the current study active surveillance was conducted among viral hemorrhagic fever (VHF) cases reported from Uttar Pradesh (UP), India. We studied the arboviral etiology of VHF; mainly Dengue, Chikungunya, and ZIKA. Methods: Clinical samples of 465 suspected VHF cases referred to tertiary care referral center of UP, India were enrolled in the study during a period from 15th May 2016 to 9th March 2018. Serum specimens were collected and analyzed for the presence of Dengue, Chikungunya, and ZIKA either by serology and/or by molecular assays. Results: Of all tested, 165 (35.4%) cases were positive for either Dengue or Chikungunya. Dengue (21.2%) was found to be the most prevalent, followed by Chikungunya, (6.6%). None of the cases tested positive for ZIKA virus. Serum samples of 35 (7.5%) cases were positive for both Dengue and Chikungunya. DEN-2 serotype was the most predominant serotype. Phylogenetic and sequence analysis of DEN-2 strains showed 100% clustering with the Cosmopolitan genotype strain. Bleeding from several sites, jaundice, abdominal pain, arthralgia, haemoconcentration, and thrombocytopenia were significantly higher in dengue hemorrhagic cases. However, the rash was significantly more common in Chikungunya patients. Most of the Dengue and Chikungunya positive cases (Age group 6-40 years) were seen in post monsoon season (September to November). Conclusion: Only one-third of total VHF cases are positive for either Dengue/Chikungunya or both. This necessitates the screening of other etiologies capable of causing hemorrhagic manifestations.

Keywords : viral hemorrhagic fever, dengue, chikungunya, zika, India

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