

Usefulness of molecular techniques in diagnosis of acute chikungunya virus infection

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Abstract

Myanmar is an endemic country for Chikungunya (CHIKV), Dengue (DENV), and Zika viruses. Clinical manifestations of these infections were similar and only laboratory tests can help for diagnosis. Various molecular and serological methods are available but only rapid diagnostic test kits are used in clinical setting. To find out the usefulness of molecular techniques for acute CHIKV infection, a descriptive study was conducted at 550-bedded Mandalay Children Hospital during rainy season in 2019. Total 202 patients presenting with acute febrile illness were enrolled. Following WHO guideline, firstly, all cases were screened for DENV infection and ruled out the DENV cases. The remaining 151 cases were checked for Anti-CHIKV IgM and IgG Antibodies by Quick Profile TM 15 Chikungunya IgM/IgG combo test (LumiQuick, Diagnostics, Inc, USA) and one-step Reverse Transcription Polymerase Chain Reaction was used to detect viral genome. Thirty-one out of 151 patients (20.5%, 95%CI%) were confirmed as acute CHIKV infection. Among laboratory confirmed cases, 27 patients (87.09%) were positive for one-step RT-PCR but only seven (22.58%) showed positive on IgM Ab. Based on diagnosis at the time of discharge from hospital, CHIKV infected patients were diagnosed as Acute Viral Infection (19 cases, 61.2%), DENV (five cases, 16.1%), viral encephalitis (two cases, 6.5%), meningitis (two cases, 6.5%), febrile convulsion (two cases, 6.5%), CHIKV infection (only one case, 3.2%) respectively. To understand the molecular epidemiology of CHIKV circulating in the study area at the time of outbreak, sequencing and phylogenetic analysis was conducted. Phylogenetic trees based on the genes encoding envelope protein and non-structural protein-1 gene revealed the epidemic strains circulating in Mandalay was close similarity to the virus circulating in India and Thailand. In conclusion, this study highlighted that molecular test could detect more cases than serological method and it is better to use for diagnosis of acute CHIKV infection.