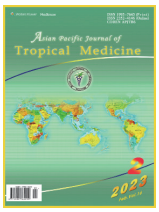

Letter to Editor

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Seroprevalence of dengue virus among adults presenting with acute febrile illness at a tertiary care hospital in South India

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Dengue virus, a member of the *Flavivirus* genus in the Flaviviridae family, has four serotypes (DEN-1 to DEN-4), and is responsible for both mild and severe dengue fever (dengue hemorrhagic fever and dengue shock syndrome)[1]. Dengue cases are under reported in India and the cases are treated clinically based on the clinical triage of symptoms[2]. Nonstructural protein (NS1) antigen is a highly conserved glycoprotein found in *Flavivirus* group such as Dengue, Zika, and Japanese encephalitis virus. Simultaneous detection of NS1 antigen, IgM and IgG antibody in a single cassette is used for testing primary and secondary dengue infection. Early diagnosis of disease progression associated with severe dengue and accessibility to appropriate medical care reduces severe dengue fatality rates to less than 1%. This retrospective study, conducted from January 2021 to December 2021 in the tertiary care hospital, South India, was aimed to determine the seroprevalence of dengue adult patients with acute febrile illness.

The study was approved by Institutional Human Ethics committee (IHEC-II/0092/21).

During the study period, blood samples were collected from the male and female patients aged ⩾18 years with history of fever, after obtaining informed consent from them. A total of 5 mL blood was collected in a plain vacutainer (red topped) for the serological tests. Serum was separated by centrifugation and was used for the rapid card or ELISA. In case the sample could not be processed on the same day, the serum samples were aliquoted into Eppendorf vials and stored in the deep freezer at -20 ℃.

The samples were subjected to immunochromatography (ICT) and ELISA for detecting NS1 antigen, IgM and IgG antibodies. ICT card used was SD Biosensor, cassette duo rapid card test and for ELISA Microlisa J Mithra testing was used. The procedures were followed according to the manufacturer instructions.

Of 1 220 samples tested by ICT, 82 (6.7%) were found to be reactive, and 65.9% were female, 80.5% were outpatient. Among the total samples, the NS1 antigen were detected in 46 (3.8%) samples and the IgM, IgG were positive in 32 (2.6%) and 4 (0.3%) samples, respectively. IgM with NS1 antigen positivity was seen in 10 (0.8%) samples and the combined IgM with IgG positivity was found in 3 (0.2%) samples. Combined NS1 antigen with IgG positivity was not found in any of the tested samples. Among the non-reactive samples (1 138), 61.0% were female and 80.0% were outpatient.

By ELISA, of 114 samples, 22 (19.3%) were found to be positive for NS1 antigen, 24 (17.5%) out of 137 were positive for IgM, 13 (15.5%) out of 84 samples were positive for IgG. Combined IgM with NS1 antigen positivity and IgM with IgG positivity were found in 10 and 5 samples, respectively. Four samples were positive for NS1 antigen as well as both IgM and IgG antibodies. None of the samples showed the combined NS1 antigen positivity with IgG antibodies. Seropositivity was found to be equal among males and females and it was higher among inpatient patients compared to OP patients (Supplementary Table 1). Increase in the number of cases was noted in the end of monsoon period (June-September) and post monsoon period (October-December) (Figure 1A). In ICT and ELISA, the maximum number of reactive cases were noted in the age group of 19-29 years, followed by 30-39 years (Figure 1B).

The present study shows that simultaneous detection of NS1 antigen and IgM antibody would be useful for the diagnosis of acute dengue infection, suggesting that the ICT can be used as primary screening test. For increasing the sensitivity and specificity, ELISA testing can be used in conjugation which will exclude the false positive or negative result.

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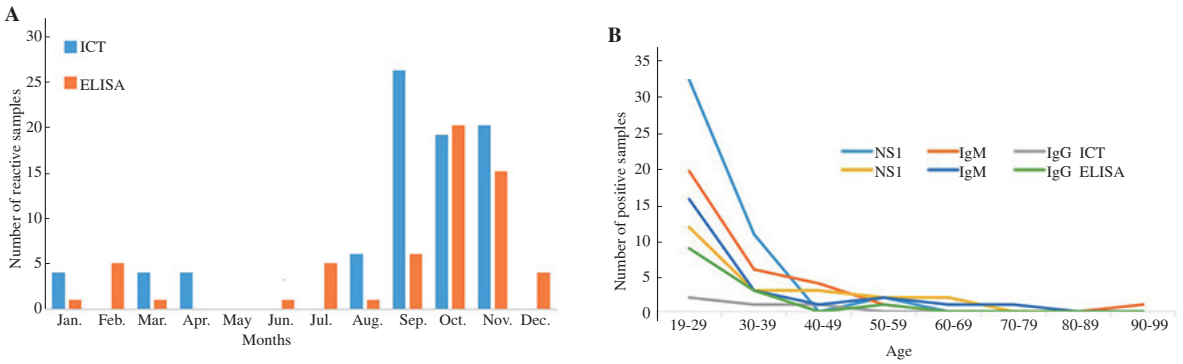

Figure 1. Month-wise distribution of reactive cases (A) and age-wise distribution of positive cases (B) by immunochromatography test (ICT) and enzyme linked immunosorbent assay (ELISA).

Conflict of interest statement

The authors declare that there is no conflict of interest.

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Authors' contributions

LM: conceptualization, methodology, investigation, and writing of original draft. PS-conceptualization,visualization, supervision, validation, writing, reviewing and editing of the final draft.

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