SHORT COMMUNICATION

Comparison of a rapid immuno-chromatography assay with a standard ELISA for the detection of IgM and IgG antibodies against dengue viruses

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Abstract A total of 765 blood samples collected from dengue suspected patients admitted to a Teaching Hospital in Sri Lanka were used to compare a rapid ICT assay with a standard ELISA for the detection of anti-dengue virus (DENV) IgM and IgG. Detection accuracy indices including sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), Chi square and Cohen's kappa values were determined for the ICT assay using the ELISA as a comparator for the detection of anti-DENV IgM and IgG. The rapid ICT assay showed a sensitivity of 64%, specificity of 75%, NPV of 68% and PPV of 72% for anti-DENV IgM detection. However, all the accuracy indices were relatively higher for the anti-DENV IgG detection by the ICT assay than those for anti-DENV IgM detection. Despite the low sensitivity for anti-DENV IgM detection by the ICT assay, considering the limitations in using ELISAs in resource limited regions, rapid ICT assays would be useful for the detection of more recent DENV infections. As many patients present after fever days 5 in the study area, anti-DENV IgM/IgG would be the suitable marker to be detected by rapid ICT assays in such areas.

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The prevalence of clinically apparent dengue virus (DENV) infections has increased significantly in recent decades. Since there is no specific treatment for dengue, patients are solely managed by supportive therapy. Moreover, prevention of dengue is challenging for health authorities despite the exhausting efforts taken in the dengue endemic countries including Sri Lanka. Though the first recombinant tetravalent vaccine (Dengvaxia) registered for use in Mexico in 2015 [9], the prevention of dengue is mainly done using vector control strategies. With the increase in clinically apparent DENV infections, the early laboratory identification of DENV infection enhances better clinical monitoring during the early phase of the illness. On the other hand, detection of DENV infection will also contribute to accurate notifications to the authorities, enabling execution of prompt dengue control measures to the affected areas. Rapid immuno-chromatography (ICT) assays are commonly used to detect anti-DENV IgM/IgG for the identification of more recent DENV infections due to their rapidity and simplicity. As many seek medical care after fever days 5, anti-DENV IgM/IgG become the suitable marker to identify a recent DENV infection in many dengue endemic countries. Additionally, detecting the anti-DENV IgG together would help to differentiate primary and secondary DENV infections.

Rapid lateral flow ICT assays available for the qualitative detection of anti-DENV IgM, IgG, IgA and NS1 antigen in human blood require minimum time, technical expertise and infrastructure [1]. In Sri Lanka, laboratory diagnosis of DENV infection is done by detecting anti-