Enigma of Laboratory Confirmation of Dengue

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Without prejudice to the possible deficiency of case definition of dengue[1] or its future modifications, a laboratory confirmation would always be essential. Serological anti-dengue virus IgM and IgG and platelet counts are integral components of basic measures to label a suspected, probable or confirmed case of dengue. The anomalies and pitfalls of serological kits have been recently evaluated meticulously. Research to establish the accuracy of eight commercial rapid immunochromatographic assays for the diagnosis of acute dengue virus infection[2] was illuminating. These assays failed to differentiate between the primary and secondary episodes of dengue viral replication. With the ever-increasing incidence of dengue and simultaneous circulation of all the four serotypes,[3] clinicians would have to manage large numbers of patients with dengue shock syndrome and dengue haemorrhagic fever. The inability of the existing rapid assay formats to guide in a precise differential diagnosis would justify search for an alternative rapid and simple diagnostic.

An enzyme-linked immunosorbent assay (ELISA) of immunoglobulin G avidity for which only one acute-phase blood serum sample has been potentially more useful for the discrimination of primary from secondary dengue virus infection, irrespective of the type of dengue antigen used.[4] Yet, another innovation has been the customized recombinant dengue multiepitope proteins that would specifically bind to anti-DENV antibodies, IgG or IgM.[5] Furthermore, the nonstructural glycoprotein 1 (NS1), recombinant DV2-NS1 proteins (rNS1), already tried as diagnostic aids,[6] might be invaluable in earlier diagnosis of dengue viremia. They might be more efficacious than rapid assays[2] for a clinical exclusion of chikungunya virus, Mayaro fever, Ross River fever, Sindbis virus, haemorrhagic fever viruses, malaria, meningitis, meningococcemia, septic shock, viral hepatitis, leptospirosis, bacterial shock or viral hepatitis.

Like the strategy adapted by Blacksell et al.[2] it has been customary to rely on the constant prolonged storage of assay kits at 4 °C and 35 °C. Continuous storage at controlled temperatures is linked with uninterrupted output by local electrically-operated appliances. The electricity supplies, even in industrialized countries, have been erratic. During the second weekend of August 2003, there was a massive power-cut lasting several days in the eastern part of the USA and Canada. Italy was plunged into darkness during the last weekend of September 2003. During August 2005 when the hurricane Katrina hit parts of the US, the loss of power was associated with auxiliary generators running out of fuel.[7] Similar catastrophes in dengue-endemic areas[2] would adversely reduce the observed sensitivity and specificity of the marketed dengue diagnostic kits during their usage. Irrespective of the case definitions,[1] rather than assisting in any dubious situation, roughly handled or stored kits would further complicate the situation.
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References


