The global resurgence of dengue in otherwise naive locations has been associated with concurrent dissemination of identical vector-borne viral diseases. Concurrent infection by dengue virus (DENV) and chikungunya virus (CHIKV) has been known for several decades. Nevertheless, recent global CHIKV dissemination or its local re-emergence after a gap has been intriguing. Increased intercontinental travel has blown up the ghost of the traditional endemic foci of CHIKV and has resulted in CHIKV patients being found in the United States. Moreover, there could even be coincidental episodes of the Japanese encephalitis virus (JEV) infection. During the early 1940s, there were dengue outbreaks in Guam, followed, during 1947, by the concurrent epidemics of mumps virus and JEV. Serological investigations in children aged 10 years or less during 1953 had revealed neutralizing antibody to JEV, and DENV-1 and -2 among those born before 1947.

In India, during 1997, concurrent infection was detected in Haryana state in the north of the country. In a follow-up study of a dengue outbreak, out of 30 serum samples collected, eight cases were found positive for dengue IgM antibodies, two were positive for all the three infections, viz. DENV, JEV and WNV, while one sample was positive for two infections, viz. JEV and West Nile virus (WNV).

There has been no chemotherapy available for patients with JEV, DENV, CHIKV or WNV. Such cases require appropriate clinical management and public health response. During the initial stage of illness the clinical presentations are ambiguous and are accompanied by viremia. These cases are highly infectious with their blood teeming with viral RNA. If bitten by the mosquito vector, they would contribute to disease dissemination. Moreover, they are likely to be offered empirical doses of antibiotics by the clinicians. Any point-of-care indication about JEV, DENV, CHIKV or WNV would be imperative from the clinical and public health perspective. That would necessitate initiating appropriate anti-vector measures attuned to vector biology. Vectors transmitting JEV and dengue/chikungunya/West Nile fever would be controlled by entirely different strategies.

A commercial diagnostic kit for the field diagnosis of Japanese encephalitis (JE) antiviral IgM has been evaluated recently. Rather than a multi-step, time-consuming format, the on-the-spot point-of-care diagnostic would address the ground realities in the JE-endemic areas. Without prejudice to the conventional enzyme-
linked immunosorbent assay (ELISA), a simpler on-the-spot diagnostic would assist health care providers better. Obviously, immunoglobulin M (IgM)-based assays would be adequate for both JE and chikungunya. Nevertheless, for dengue, additional markers would be essential. The immunological response during the secondary or tertiary dengue episodes is secondary rather than a primary one. The initial immunological response would be towards IgG production rather than IgM. Dengue non-structural antigen, NS1, has been reported to be better than IgM in cases of primary or secondary infections.[8] Immuno chromatographic assay kits for a point-of-care dengue IgG and IgM detection have been popular for a while, namely, the Panbio Dengue Duo IgM and IgG Rapid Strip test, and the Bio-Check Plus Dengue G/M Cassette Test (Brittney). Recent introduction of a rapid, immunochromatographic kit for chikungunya has been a positive feature.[9]

International organizations including the World Health Organization, the Programme for Appropriate Technology in Health (PATH) and the Centers for Disease Control and Prevention (CDC) would be obliged to encourage standardization of a concurrent point-of-care diagnostic for JE, dengue, chikungunya and West Nile fever. A multifaceted but cost-effective rapid assay format would be a valuable armour for clinicians and public health personnel to diagnose dengue, chikungunya, Japanese encephalitis and West Nile fever.

References


