

Research article

Antibodies against prM protein distinguish between previous infection with dengue and Japanese encephalitis viruses.

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Abstract

Background: In Southeast Asia, dengue viruses often co-circulate with other flaviviruses such as Japanese encephalitis virus, and due to the presence of shared antigenic epitopes it is often difficult to use serological methods to distinguish between previous infections by these flaviviruses.

Results: Convalescent sera from 69 individuals who were known to have had dengue or Japanese encephalitis virus infection were tested by western blotting against dengue, Japanese encephalitis and West Nile virus antigens. We determined that individuals who had been infected with dengue viruses had IgG responses against the premembrane protein of dengue viruses but not Japanese encephalitis, whereas individuals who had been infected with Japanese encephalitis had IgG specific for the premembrane protein of Japanese encephalitis virus but not the dengue viruses. None reacted with the premembrane protein of West Nile virus. Using the Pearson Chi Square test, it was determined that the difference between the two groups was highly significant with a p value of <0.001.

Conclusion: The use of flavivirus premembrane protein in seroepidemiological studies will be useful in determining what flaviviruses have circulated in a community.

Background

Dengue haemorrhagic fever (DHF) was first described in Southeast Asia half a century ago, and has become increasingly important as a cause of paediatric morbidity and mortality in Southeast Asia over these past decades. Although the dengue viruses have circulated in this and other parts of the world previously, the viruses caused dengue fever (DF) rather than the more severe DHF, which has been for the most part, a Southeast Asian phenomenon since the 1950s. In recent years however, epidemics of dengue outside Southeast Asia have been associated with

DHF and it has become a disease of global importance. Dengue viruses are not the only flaviviruses which have spread beyond their traditional ecologies. This is evident from the establishment and maintenance of West Nile virus (WNV) in the eastern United States over the last 3 summers. Japanese encephalitis virus (JEV) is another example of a flavivirus extending its boundaries. First isolated in Japan in 1935, JEV had been causing extensive outbreaks of encephalitis in parts of East Asia until the introduction of a vaccine in the middle of the last century. Although Japanese encephalitis has now been controlled