

Abstract

The infection scale of Japanese encephalitis has been greatly reduced due to the effective vaccination program. However, the recent report of sporadic cases has raised concerns about the occurrence of endemic outbreak. Although the number of cases aged less than 10 years has decreased significantly, the number of adult cases has increased over the years. The aim of this study was to evaluate the vaccination program in Taiwan by assessing the neutralizing antibody among people of various age groups from different living environments.

A total of 2800 residual serum samples were collected from hospitals around the island stratified by 7 age groups and 4 living areas. Each age group included 400 samples equally distributed among areas. Serum JE neutralizing antibody was measured by the plaque reduction neutralization test with a 50% reduction as seroconversion. The seroprevalence of JE antibody was compared among cohorts as well as among areas.

In northern Taiwan, the cohorts born during 1953-1962 and 1963-1972 had the lowest seroprevalence of 44%. In central Taiwan, the cohort born during 1953-1962 had the lowest seroprevalence of 35%, followed by the 1973-1982 cohort (40%). In southern Taiwan, the population with the lowest seroprevalence (33%) was surprisingly found in the 1983-1992 cohort, followed by the 1963-1970 cohort (39%). In eastern Taiwan, the population with the lowest seroprevalence was also the 1963-1972 cohort (32%), followed by the 1973-1982 cohort (42%). Overall, the 1963-1972 cohort had the lowest seroprevalence of 40.8%, followed by the 1953-1962 cohort of 44.5%. The 1983-1992 and 1973-1982 cohorts also had relatively low seroprevalence of 45%.

In this national survey, we found that the JE antibody seroprevalence was lower than previous studies, especially among the 10-50 years old age groups, suggesting the opportunity of natural infection has largely decreased, the persistence of vaccine has reduced, and the size of susceptible population might increase as well. On the other hand, however, given the fact that the incidence of confirmed JE case remains low and under the condition of smaller infection scale, the previous criteria of seroconversion might need to be revised. When novel vaccine is ready, A third booster before age 18 years may be considered to further enhance the antibody titers, especially if the odds of natural infections have significantly reduced. The persistence of antibody and factors affecting it need to be studied. The changes of antibody titers over time among immunized population need to be followed to determine the number and schedule of booster doses in Asian countries where natural infections become less common.

Keywords: Japanese Encephalitis ; Seroepidemiology ; Vaccination policy