

ABSTRACT

Molecular Epidemiological, Serological and Immunological Studies on Dengue and West Nile Viruses in Jamaica

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The number of severe cases of dengue virus (DENV) infection is increasing and West Nile virus (WNV) is an important public health threat. Suspected dengue cases (n=1647) during 2003-2007 and healthy persons (n=277) were screened for dengue antibodies. The DENV serotypes, genotypes in circulation and the human leukocyte antigen (HLA) associations with dengue were determined. The patients were screened for leptospirosis (n = 590) and WNV (n = 435).

The seroprevalence of dengue antibodies, dengue IgM and dengue IgG antibodies was 59.4% (979/1647), 15.4% (254/1647) and 51.0% (840/1647), respectively in suspected cases. Dengue IgG antibodies increased with age from 38.4% in patients less than 1 year to 90% in those 60 years and over ($p = 0.000$; 95% confidence interval (CI) = 0.000-0.002). Higher prevalence of dengue IgM antibodies occurred in males (10/105, 9.5% vs 0/172, 0.0%; $\chi^2 = 17.0$, $p = 0.000$). Dengue IgG antibodies were found in all 277 healthy control sera. Dengue RNA was found in 2.6 % (20/770) of sera and 7.3% of cell cultures.

All 4 serotypes including DENV-1 (15%), DENV-2 (35%), DENV-3 (15%) and DENV-4 (35%) were found. The DENV-1 belonged to genotype III, DENV-2 strains classified with American, American-Asian and Asian genotypes while DENV-4 strains segregated into a separate clade from published reference sequences. The emerging, reemerging and new strains of DENV-2 and DENV-4 circulating in Jamaica might have contributed to the 2007/2008 outbreak.

HLA-A*24 and -DR β 5*01/02 were associated with dengue. HLA-A*23, -CW*04, -DQ β *02, -DQ β *03 and -DQ β *06 were protective. These HLA associations differ from those found in other populations.

Leptospira IgM was found in 5% (27/590) of patients with dengue-like illness. Dengue IgM negative (6.9% vs 2.5%, $p < 0.05$) and dengue IgG positive patients (8.0% vs 3.5%, $p < 0.01$) were more likely to be Leptospira IgM positive.

No evidence of WNV infection was found but Dengue remains an important threat.

Keywords: Michelle Georgiana Brown; West Nile virus; Dengue-Jamaica; Dengue viruses; West Nile virus disease