CHARACTERIZATIONS OF A HAMSTER-DERIVED WEST NILE VIRUS ISOLATE INFECTION IN A MURINE MODEL

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West Nile Virus (WNV) has caused seasonal epidemics of encephalitis in the United States for over a decade. Recent studies in WNV patients and hamsters indicate that WNV can produce a persistent non-lethal infection. WNV isolates recovered from persistently infected hamster urine were phenotypically and genetically different from its parent virus NY99 strain. Here, we studied infection by a hamster urine isolate- WNV H8912 in a murine model. Initially, we infected two mouse cell lines- mouse macrophage cells (12j) and kidney epithelial cell line (Renca). We found that WNV H8912 infection in both 12j and Renca cells had a lower viral load and smaller plaque size as compared to WNV NY99 strain. There was a differential production of proinflammatory cytokines in these two mouse cell lines. Infection of WNV H8912 in mouse macrophage cell line (12j) induced higher expression of IL-6 and TNF-α and more nuclear translocation of NF-κB activation compared to WNV NY99. In contrast, the production of these cytokines was reduced in WNV H8912-infected Renca cells as compared to WNV NY99 and there was less nuclear translocation of NF-κB in WNV H8912-infected Renca cells. Further, we noted that all mice survived an intraperitoneal infection of WNV H8912; whereas mice succumbed to intracerebral infection of WNV H8912 with a survival rate of 0-40%. Overall, we conclude that WNV H8912 is a non-neuroinvasive but neurovirulent strain. It has a lower replication rate and induces a differential immune response in mouse macrophages and kidney epithelial cells.