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Comparison Of West Nile Virus Infection In Mice With And Without Disease

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West Nile virus (WNV) causes varying degrees of disease in different hosts. Previous research has shown that West Nile disease differs between inbred mouse strains. We hypothesized that mice with subclinical infection (no signs of disease) will have lower viral titers, faster viral clearance, and/or exhibit differences in tissue tropism from mice with disease. Viral load in various tissues was compared between C57BL/6 (B6) mice, a strain more resistant to disease, and C3H mice, a more susceptible strain. Fifty-two mice of each strain were inoculated subcutaneously with 10^3 PFU WNV in the left rear footpad. All mice were weighed and scored daily for clinical signs of disease. Six to eight mice from each strain were sacrificed based on clinical score, and tissues were harvested on days 7, 8, 9, 10, and 14 post inoculation (p.i.). Tissues included spleen, draining popliteal lymph node, heart, kidney, brain, and spinal cord. Of the total mice sacrificed at each time point, three were subclinical, and three to six exhibited clinical signs. Additionally tissues were harvested from mice that were euthanized for humane reasons at any time p.i.. Viral titers for each tissue were determined by plaque assay on Vero cell cultures. Tissue tropism was the same for both diseased and subclinical mice, but the viral titers and kinetics varied. Diseased mice had greater viral titers when compared to subclinical mice after day 8 p.i., especially in the central nervous system (CNS). Mice with subclinical infection experienced viral clearance more rapidly than diseased mice in most tissues; however, virus persisted in the CNS of all mice up to day 14 p.i.. In summary, WNV was detected in the CNS of all mice, but greater viral titers were observed in mice with disease. These data suggest that viral load in the CNS correlates with disease severity.