

Patients with West Nile virus meningitis or encephalitis, but not acute flaccid paralysis, had favorable outcomes

Sejvar JJ, Haddad MB, Tierney BC, et al. Neurologic manifestations and outcome of West Nile virus infection. *JAMA*. 2003;290:511-5.

QUESTION

For patients with neurologic manifestations of West Nile virus (WNV) infection, what is the long-term outcome?

DESIGN

Inception cohort with 8-month follow-up.

SETTING

Tammany Parish, Louisiana, USA.

PATIENTS

16 patients (median age 57 y, 56% men, 69% white) with confirmed WNV infection (WNV-specific antibodies were detected in acute-phase serum or cerebrospinal fluid samples by IgM antibody-capture enzyme-linked immunosorbent assay and by plaque-reduction neutralization assay).

ASSESSMENT OF PROGNOSTIC FACTORS

Clinical, neurologic, and laboratory features at initial presentation of WNV infection.

MAIN OUTCOME MEASURES

Neurologic outcomes at 8 months.

MAIN RESULTS

5 patients had West Nile meningitis (WNM), 8 had West Nile encephalitis (WNE), and 3 had poliomyelitis-like acute flaccid paralysis (AFP). The median time from illness onset to presentation was 2.5 days. Patients had a median hospital stay of 12 days (range 4 to 36 d). Patients showed clinical features including altered mental status ($n = 9$, 56%), tremor ($n = 15$, 94%), myoclonus ($n = 5$, 31%), and Parkinsonism ($n = 11$, 69%).

At 8 months, 1 patient (6%) with WNE died, 11 (69%) were home and functioning independently, 3 (19%) were home but dependent, and 1 (6%) was in rehabilitation. 10 patients (63%) reported persistent fatigue, 3 (19%) persistent myalgias, and 2 (12%) persistent headache. Among the 5 patients with WNM, no neurologic deficits were seen. Of the 7 surviving patients with WNE

and 3 with AFP, 5 patients had tremor and 5 had Parkinsonism. Of the 7 surviving patients with WNE, 5 had favorable outcomes (defined as attaining or exceeding their preillness level of function) and recovered to normal or near-normal functioning within 4 months. The 3 patients with AFP did not improve in limb weakness; all reported continuing difficulties with daily activities, and all required the use of a wheelchair for ambulation.

CONCLUSION

Among patients with West Nile virus (WNV) infection, those with WNV meningitis and WNV encephalitis had favorable outcomes, but those with acute flaccid paralysis did not recover limb strength.

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COMMENTARY

Since its appearance in New York in August 1999, human infection with WNV has spread over much of the United States and adjacent Canada. As of January 2004, 8977 human cases of WNV infection (2667 cases of meningoencephalitis and 218 deaths) have been reported to the Centers for Disease Control and Prevention (1). The vast majority of transmissions involve mosquitoes that feed on both viremic birds and humans (2). Mosquitoes feeding on birds create a large reservoir of WNV infection. Most infected persons remain asymptomatic but about 20% develop West Nile fever, a self-limited "flu-like" illness, and < 1% develop neuroinvasive disorders, including WNM, WNE, or AFP. The severity of disease and mortality in WNV infection increase with increasing age (2, 3) and may reach up to 35% in patients > 65 years of age (3).

The study by Sejvar and colleagues examined patients from 1 community for 1 month for hospital admission from neuroinvasive WNV infection and enrolled only 16 patients. This small sample limits the inferences that can be made. The finding that 69% were at home and independent at 8 months contrasts with the 1 previous study in which only 37% reported full recovery at 12 months (2). Larger studies will be needed to resolve this discrepancy.

Nevertheless, this detailed neurologic study affords several important new insights. First, although only about 33% of patients can be discharged home without support (mostly those who had WNM) (2),

many more will show significant recovery with time, usually complete by 4 months. Severe WNE is still consistent with favorable outcomes despite the median age of 70 years and adverse Glasgow Coma Scale Score. Second, the occurrence of tremor, myoclonus, or Parkinsonism is common and can be used to help diagnose neurologic WNV infection. Third, the clinical entity of AFP (without WNE or WNM in 2 of 3 cases) was defined and related to anterior horn cell involvement with early severe asymmetric limb weakness and poor recovery.

Because no specific treatment or vaccine is currently available and large epidemics can be expected, prevention by public education, personal protection, and eradication of standing water and mosquitoes remains the mainstay of control of WNV infection.

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