West Nile Virus Encephalitis: Clinical Diagnostic and Prognostic Indicators in Compromised Hosts

To the Editor—I read with interest the article by Penn et al. [1] regarding persistent West Nile virus (WNV) infection in a compromised host. Their report outlines the difficulty in diagnosing WNV meningoencephalitis in a patient with B cell lymphoma in the absence of a WNV serological response.

In compromised hosts with WNV infection and impaired B lymphocyte function, the clinical assessment of the patient may provide clinical clues to the diagnosis and prognosis of WNV encephalitis. The patient described by Penn et al. [1] developed meningoencephalitis during an outbreak of WNV encephalitis. Symptoms consistent with the diagnosis of WNV encephalitis included flaccid paralysis and/or tremor with encephalitis or meningoencephalitis, and the patient’s physicians correctly suspected the diagnosis on day 2 of the patient’s hospitalization [2].

In a patient with encephalitis, either optic neuritis or chorioretinitis, if present, may suggest the possibility of WNV encephalitis [3]; these were not described in this patient [2]. The patient reported had normal head MRI findings, but if the MRI had shown bilateral hyperintensities in the thalamus and/or basal ganglia, the possibility of WNV encephalitis would have been enhanced [4]. Similarly, electroencephalogram findings are not given in the report. Most patients with WNV encephalitis have diffusely abnormal electroencephalogram findings, but some patients with WNV encephalitis have prominent slowing in the anterior regions, which is not commonly seen in other types of viral encephalitis [5].

Serial relative lymphocyte counts are not provided in the report, but the degree and duration of relative lymphopenia has both diagnostic and prognostic importance in WNV encephalitis. If relative lymphopenia (lymphocytes ≤10%) is prolonged and persistent, the diagnosis of WNV encephalitis is likely for otherwise unexplained encephalitis. Furthermore, the more profound and prolonged the relative peripheral lymphocyte count is, the worse the prognosis is. In a patient with encephalitis, the higher the serum ferritin level is, the more likely it is that the patient has WNV encephalitis, compared with other causes of viral encephalitis. Serum ferritin levels may also be useful prognostically. The higher the serum ferritin level (n≥240 ng/mL) i.e., levels >500 ng/mL, the more likely it is that there will be neurologic sequelae or a fatal outcome [6, 7].

In conclusion, in patients with WNV encephalitis or meningoencephalitis, an initial low relative lymphocyte count and/or a highly elevated serum ferritin level (≥500 ng/mL) may be helpful in suggesting the diagnosis of WNV encephalitis before serological test results are available. Prolonged and severe relative lymphopenia in patients with WNV encephalitis suggests a complicated course of illness and a guarded prognosis [8]. Serial relative lymphocyte counts and serum ferritin level determinations may be useful diagnostically for patients with WNV meningoencephalitis or encephalitis with a blunted or absent humoral response.

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References