West Nile virus (WNv) Notes for Clinicians

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After initial introduction and spread in 2002 – 2003, especially in south eastern Alberta, there were very few documented cases of WNv infections in Alberta in 2004 – 2005, making it difficult to predict what to expect in the 2006 season. Nevertheless, clinicians will again need to consider the possibility of WNv infection in their patients this summer and fall.

When should WNv infection be considered in a differential diagnosis?

WNv infection should be considered if:

- The patient's clinical presentation is compatible; and
- Epidemiologic considerations are met.

What are the clinical features of WNv infection?

About 80% of WNv infections are sub-clinical, 20% result in a milder self-resolving non specific febrile illness (West Nile Non-Neurological Syndrome, formerly West Nile Fever) and <1% result in an acute neurologic illness (West Nile Neurologic Syndrome).

West Nile Non-Neurological Syndrome is a febrile illness with onset 2-14 days after infection and can be characterized by malaise, myalgia , arthralgia ,nausea, vomiting headache or retro-orbital pain. Maculo-papular or morbilliform rash occurs in about 50% and more often in children. Hepatomegaly is reported in about 20% and splenomegaly in 10%. Symptoms resolve over 3-6 days. Surveillance data indicates that fever is not present in approximately 33% of cases.

West Nile Neurologic Syndrome occurs in about 1/150 infected individuals, developing 1-7 days after onset of fever. In this syndrome about 2/3 develop encephalitis with or without meningitis and about 1/3 meningitis alone. Headache and eye pain occurs in West Nile Fever and is not itself indicative of neuro-invasive disease. Age (>50 years) is by far the greatest risk factor for neurologic involvement. The overall case fatality rate for neurologic disease is 4-14% (higher in elderly, immunocompromised and those with co-morbidities). Neurologic sequelae are very common amongst survivors – at one year 1/3 have not fully recovered. In paralytic cases, little long term improvement will occur.

Clinical features of West Nile Neurologic Syndrome include one or more of:

- Altered level of consciousness
- Neuromuscular weakness, including acute flaccid paralysis reminiscent of Guillain Barre syndrome or polio
- Movement disorders such as ataxia or extrapyramidal signs
- Meningitis
- Cranial nerve palsies
- Myelitis
- Seizures
- Polyradiculopathy

What laboratory or radiologic features suggest WNv infection?

- Blood hematology and chemistry values are usually normal or non specifically abnormal eg leukocytosis, leucopenia , hyponatremia.
- Neurologic involvement is characterized by typical CSF abnormalities: lymphocytic pleocytosis, elevated protein, normal glucose.
- Brain imaging studies (CT,.MRI) may either be normal or non-specifically abnormal.
- EEG may show diffuse slowing and in some cases seizure activity.
- EMG studies may be helpful in paralytic cases.

What epidemiologic features will support the possibility of WNv infection?

In the southern USA, WNv can be transmitted much of the year. Compatible symptoms in a returned traveler should prompt WNv infection consideration. In infection acquired in Canada, WNv cases occur beginning in mid-July. None have become symptomatic after late September. Based on the epidemiology in previous years, clinicians should consider WNv in non-travelers who present from late June to early October. If there is evidence of WNv from local surveillance reports of mosquitoes, birds or animals then the possibility of WNv infection should be considered much more likely.

Other more uncommon modes of transmission that have recently been described include receipt of blood and blood products, organ and tissue transplantation, occupational exposure in laboratory settings*, in utero* and possibly breast milk.

What alternatives to WNv Neurologic Syndrome should be considered?

Because of the variety of presentations of WNv infection, a number of infectious and non-infectious causes should be explored, depending on the particular clinical presentation, while waiting for laboratory tests. The major alternative viruses causing encephalitis in Alberta are herpes simplex virus (sporadic) and enteroviruses (usually late summer and fall but can be seen at other times). If in doubt, consultation with a Neurologist or Infectious Disease specialist is recommended.

When should testing for WNv infection be considered?

Specific laboratory testing of blood or CSF for WNv infection is required for definitive diagnosis. Testing of patients with non-neurologic febrile illness is of no clinical utility and so is not recommended. Blood, organ, and tissue, donors are screened to prevent transmission.

Testing patients with acute neurologic presentations is potentially helpful, even without available treatment for WNv. Unnecessary or potentially harmful diagnostic and therapeutic strategies can be avoided, and a prognosis can be given. Testing should be strongly considered when a patient presents with any of the clinical neurologic features, and has compatible CSF findings, especially if animal or mosquito surveillance supports local WNv transmission.

What is the management of WNv encephalitis?

In the absence of antiviral therapy of known value management is entirely supportive/rehabilitative as would be the case for other forms of viral encephalitis.