

Alberta Health and Wellness

West Nile virus (WNV) Notes for Clinicians

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After initial introduction and spread in 2002 – 2003, West Nile virus is now endemic in parts of the province especially in south eastern Alberta. Nevertheless, there has been and likely will continue to be variation from year-to-year in case numbers, based on ecological factors and climatic conditions. Clinicians will need to consider the possibility of WNV infection in their symptomatic patients each summer and fall. Since WNV is now endemic, laboratory testing needs to distinguish previous infection from acute infection.

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 asymptomatic, 20% result in a 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 usually 2-6 days after infection and can be characterized by malaise, myalgia, arthralgia, nausea, vomiting, and 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. CCR-5 inhibitors, used in the treatment of HIV may increase infection risk. 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 more than 1/3 have not fully recovered. In paralytic cases, little long term improvement will occur. Rarer manifestations include myocarditis, pancreatitis and hepatitis.

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 e.g., leukocytosis, leukopenia, 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. For infection acquired in Canada, cases of WNV can occur beginning in mid-July until early October. Locally acquired cases have been rare/non-existent to date in the mountain areas and northern half of the province

Other more uncommon modes of transmission that have 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 and is provided by the Provincial Laboratory for Public Health. Blood, organ, and tissue, donors are routinely screened to prevent transmission. Apart from neurologic syndromes, other patient groups where testing could be considered include those with persistent fever following blood transfusion or organ/tissue donation, or fever in a recent (up to 8 weeks) blood/organ or tissue donor, or pregnant women with unexplained fever.

Testing patients with acute neurologic presentations is potentially helpful, even without specific treatment for WNV. Unnecessary or potentially harmful diagnostic and therapeutic strategies can be avoided, and a prognosis can be given.

What is the management of WNV encephalitis?

In the absence of effective antiviral therapy of known value management is entirely supportive and rehabilitative as would be the case for other forms of viral encephalitis. Long lasting or permanent neurologic sequelae of encephalitis or flaccid paralysis may occur.