POWASSAN VIRUS DISEASE

NOVA SCOTIA

Case Definition

Confirmed case

A case that has *confirmatory* laboratory results with or without clinical evidence criteria.

Probable case

A case that meets supportive laboratory results **AND** clinical evidence criteria.

Laboratory Evidence

Confirmatory laboratory tests include:

- Isolation of POW virus (POWV) from blood, cerebrospinal fluid (CSF), brain tissue, or any other biological fluid or tissue; **OR**
- Detection of POW-specific nucleic acids in blood, CSF, brain tissue or any other biological fluid or tissue; **OR**
- Serological detection of POW-specific IgM by Enzyme immunoassay (EIA) assay *AND* observation of a significant increase in neutralizing antibody titre by Plaque-reduction neutralization tests (PRNTs) between acute and convalescent serum without evidence of other flaviviruses; **OR**
- POW-specific IgM seroconversion by EIA (negative to positive) between acute and convalescent serum *AND* detection of neutralizing antibodies by PRNTs ≥ 20 without evidence of other flaviviruses; **OR**
- Significant increase in total antibody titer by Hemagglutination Inhibition (HI) test between acute and convalescent serum *AND* detection of neutralizing antibodies by PRNTs ≥ 20 without evidence of other flaviviruses; **OR**
- Seroconversion of total antibody titre by HI test (negative to positive [≥ 20]) between acute and convalescent serum *AND* detection of neutralizing antibodies by PRNTs ≥ 20 without evidence of other flaviviruses; **OR**
- Detection of POW-specific IgM by an EIA test on CSF (serum is not included) AND observation of a neutralizing antibody titre by PRNTs ≥ 20 without evidence of other flaviviruses.

Supportive laboratory evidence:

- Serologic detection of POW-specific IgM by EIA assay *AND* observation of a neutralizing antibody titre by PRNTs assay ≥ 20 on a single serum; **OR**
- Serological detection of POW-specific IgM by EIA without a significant increase in neutralizing antibody titre by a PRNTs test between serum collected in the acute phase and that collected in the convalescent phase; **OR**
- Serological detection of a single HI titre ≥ 20 *AND* detection of neutralizing antibodies by PRNTs.

Clinical Evidence

Clinical evidence includes at least one of the symptoms of the initial febrile phase or neuroinvasive disease. Symptoms in the initial febrile phase of the disease can include fever, sore throat, drowsiness, headache, and disorientation.[1] Symptoms in the neuroinvasive disease, can include fever, vomiting, respiratory distress, loss of coordination, speech difficulties, paralysis, and seizures.[1]

The risk of transfusion-associated transmission remains uncertain and merits vigilence.[2]

Reporting Requirements

Report confirmed and probable cases to DHW Surveillance Team via Panorama.

Additional Forms

None.

Data Entry

Complete data entry in Panorama.

Additional Comments

- Powassan Virus Disease is a provincially notifiable disease. Case counting will be applied as of May 23, 2023.
- These are definitions for surveillance and epidemiologic purposes only, and they do not represent clinical case definitions.
- Due to serological cross-reactivity between flaviviruses, a single-sample PRNT antibody titre must be ≥ four-fold greater than that for other relevant flaviviruses (e.g. West Nile virus, dengue, Zika), based on geographic area of exposure and/or vaccination history.
- In immunosuppressed patients, low titres may be observed and alternative tests, such as PCR, should be considered in these cases. Furthermore, in some cases, only a single serum sample may be received as a result of a fatal illness.
- CSF should not be submitted exclusively, as the performance diagnostics of IgM ELISA on these samples remains unknown. CSF samples should be submitted in parallel with serum samples.
- Diagnostic testing should be performed by provincial public health laboratories and/or appropriate reference diagnostic centres such as the NML. PRNTs for detecting POWV-specific antibodies should be performed at an appropriate reference centre such as NML.

References

1. Hermance, ME, Thangamani, S. Powassan Virus: An Emerging arbovirus of public health concern in North America. Vector-Borne and Zoonotic Diseases. 2017; 17(7): 453-462. doi:10.1089/vbz.2017.2110.
2. Bloch, EM, Tobian, AAR, Katz, LM. Powassan virus: What is the risk to the blood supply? Transfusion. 2021; 61(12):3286–3288. doi:10.1111/trf.16725.