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## Viral Meningitis Outbreak Strikes Prince William Sound

During the first week in August, the Section of Epidemiology received reports of an outbreak of illness characterized by headache, nausea and vomiting, fever, neck pain, and photophobia in a village in Prince William Sound (PWS). Subsequently, other community health care workers reported patients with similar signs and symptoms of illness in the PWS area. Many of these patients attended a regional camp in PWS during the month of July.

**Investigation**

A questionnaire was used to gather information about cases and contacts. A clinical case of viral meningitis was defined as any person with a history of headache, nausea and/or vomiting, plus any one of the following symptoms: neck pain, photophobia, sonophobia, feverishness, chills, or myalgias.

Active surveillance involved Epidemiology staff calling participants of the summer camp noted above as well as any contacts of cases who were sick with a similar constellation of symptoms. Laboratory confirmed cases were culture positive for enterovirus from cerebro-spinal fluid (CSF), stool swab, or nasopharyngeal swab.

**Results**

As of September 7, 2001, 76 clinical cases came from the following areas: Anchorage, Chenega Bay, Cordova, Fort Wainwright, Homer, Nanwalek, Port Graham, Tatitlek, Valdez, and Wasilla.

The peak onset of illness occurred in early August (Figure 1). The age range of patients was 3 months to 59 years, and the mean age was 15 years. Forty-seven (61.8%) patients were female.

Of the 76 cases, 30 (39.5%) attended the summer camp mentioned above. Of the 104 people who reportedly attended the summer camp, 90 (86.5%) were interviewed. The clinical attack rate was 33.3% for those camp attendees interviewed.

To date, of the 31 individuals whose specimens were submitted to the Alaska State Virology Laboratory (AVL) for evaluation, twelve individuals had cultures that grew an enterovirus. Eight of the twelve enteroviruses grown were successfully serotyped. All eight of the serotypes were echovirus 18. Other enterovirus isolates are currently undergoing neutralization studies for serotype identification.

**Discussion**

This outbreak of enteroviral meningitis has involved many communities throughout PWS and beyond. The majority of cases occurred in children during late July and early August. The gender distribution was predominantly female (61.2%), which is unusual for enteroviral infections; they typically show a 1.5:1 male to female incidence ratio (1). Thirty (39.5%) of the cases were individuals who attended a summer camp in PWS during the month of July. The high attack rate for this summer camp population is also unusual for enteroviruses. The typical attack rate for enteroviral meningitis is less than one percent.

Over 65 known strains of enteroviruses cause the majority of viral meningitis cases. Enteroviruses are RNA viruses that are members of the picornavirus family and include coxsackieviruses A and B, echoviruses, "numbered enteroviruses," and polioviruses. So far, all of the isolates that were serotyped were echovirus 18. Little has been written about echovirus 18 in the medical literature. The virus was first isolated in Cincinnati, and has since been associated with a number of illnesses, including paresis, encephalitis, exanthem and aseptic meningitis (2).

Viral meningitis can occur sporadically or as an outbreak, and tends to be seen most commonly in the late summer months. A high prevalence of echovirus 18 was also seen in North Carolina, Tennessee, and Texas this summer (unpublished data). No vaccine exists for this virus.

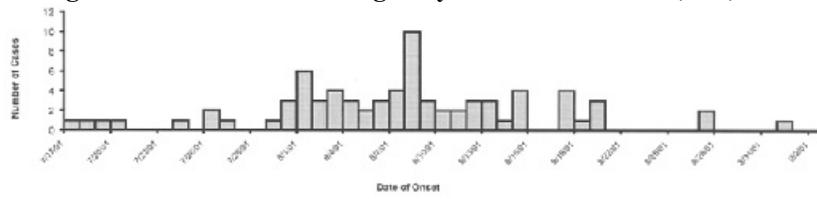
**Recommendations**

1. Enteroviruses are spread by direct contact with nose and throat secretions and feces of infected persons. The best method of interrupting transmission is diligent and frequent hand washing.
2. Alaska health-care providers who see patients that meet the case definition noted above should contact the Section of Epidemiology.
3. Nasopharyngeal (NP) and rectal swabs, as well as CSF and acute sera can be tested for enteroviruses at the AVL in Fairbanks. Submit swabs in viral transport media. Note: rectal swabs, as opposed to NP swabs, are more likely to yield enteroviruses.
4. Because persons with bacterial meningitis may present initially with symptoms similar to those of viral meningitis, it is crucial that health-care providers carefully evaluate each patient to rule out the possibility of bacterial meningitis. Unlike viral meningitis, bacterial meningitis can be a life-threatening disease with severe sequelae.

**References**

1. Rotbart, HA: Enteroviruses. P. 1001. In Richman, DD, Whitley RJ, Hayden FG (ed): *Clinical Virology*. Churchill Livingstone Inc., New York, New York, 1997.
2. Lagercrantz, M., et al.: Spread of Echovirus Type 18 infections within families. *Scand. J Infect Dis* 5:249-252, 1973.

**Figure 1. Cases of Viral Meningitis by Date of Onset - PWS, AK, 2001**



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