

## MENINGITIS, ASEPTIC

(Lymphocytic Choriomeningitis, Meningoencephalitis, Viral Meningitis)

### REPORTING INFORMATION

- **Class B:** Report by the close of the next business day after the case or suspected case presents and/or a positive laboratory result to the local public health department where the patient resides. If patient residence is unknown, report to the local public health department in which the reporting health care provider or laboratory is located.
- Reporting Form(s) and/or Mechanism: The Ohio Disease Reporting System (ODRS) should be used to report lab findings to the Ohio Department of Health (ODH). For healthcare providers without access to ODRS, you may use the [Ohio Confidential Reportable Disease form](#) (HEA 3334).
- Key fields for ODRS reporting: laboratory specimen type (CSF), laboratory test name (select the test name from the drop down menu), laboratory result (select "negative" if no growth), laboratory organism (if known, select the virus isolated from the organism drop down menu).

### AGENTS

The term aseptic meningitis applies to any meningitis (infectious or non-infectious) for which a cause is not apparent after initial evaluation, including routine stains and cultures of cerebrospinal fluid. Aseptic meningitis is a syndrome of multiple etiologies, but many cases are caused by a viral agent.

Viral etiologies include:

- Enteroviruses: Coxsackievirus Group A and B, Echovirus.
- Herpes simplex virus (HSV).
- Mumps, arboviruses, measles, varicella, lymphocytic choriomeningitis virus and adenovirus.

### Cases with an infectious non-viral etiology are not reported as aseptic meningitis.

They are reported as diseases caused by their identified organisms.

- Spirochetes: *Treponema pallidum* (syphilis), *Borrelia burgdorferi* (Lyme disease), *Leptospira* species
- Rickettsiae
- Protozoa: *Naegleria fowleri*
- Helminths: *Angiostrongylus cantonensis*
- Fungi: *Cryptococcus* (see Meningitis, Bacterial)

### CASE DEFINITION

#### Clinical Case Definition

A syndrome characterized by acute onset of meningeal symptoms, fever, and cerebrospinal fluid pleocytosis, with bacteriologically sterile cultures.

#### Laboratory Criteria for Diagnosis

No evidence of bacterial or fungal meningitis (i.e. no bacteria identified on gram stain of CSF, no bacteria grown on culture of CSF) and CSF findings (cell count, protein levels and glucose levels) inconsistent with bacterial infection. Virus can occasionally be cultured from CSF; acute and convalescent serologic studies can assist in diagnosis.

#### Case Classification

Suspect\*: A clinically compatible case that is not yet laboratory confirmed and is not yet diagnosed by a physician as aseptic meningitis.

**Probable\*:** A clinically compatible case that is diagnosed by a physician as aseptic meningitis with no laboratory tests performed, or a laboratory present but no mention of negative bacterial evidence.

**Confirmed:** A clinically compatible illness diagnosed by a physician as aseptic meningitis, with no laboratory evidence of bacterial or fungal meningitis (If bacteria or other etiologic agents are identified, the case is classified under the identified etiology.)

**Not a Case:** This status will not generally be used when reporting a case, but may be used to reclassify a report if investigation revealed that it was not a case.

\* Suspect and probable case classifications can be used for initial reporting purposes to ODH; as CDC only has a case definition for confirmed cases.

## **SIGNS AND SYMPTOMS**

Predominantly a syndrome of infants and children. Onset may be abrupt or gradual. Patients generally recover without residual effects. In very young infants, permanent neurologic sequelae may occur.

Headache, fever, malaise and anorexia, followed by evidence of meningeal irritation (stiff neck, irritability). Abdominal pain, nausea and vomiting are common. Sore throat, chest pain and generalized muscular aches occur occasionally. Infants <1 year of age are less likely to have meningeal signs. Symptoms generally subside rapidly and spontaneously, with recovery in 7-10 days. Convulsions, coma or alterations in consciousness are rare events.

## **DIAGNOSIS**

Clinical features and examination of cerebrospinal fluid (CSF), which reveals increased lymphocytes, predominantly mononuclear cells. CSF pressure is generally slightly elevated, fluid is clear to slightly cloudy, protein content is normal in the acute stage but increased at two weeks after onset. Glucose level remains normal, not decreased as in bacterial meningitis. Virus can also be isolated from CSF, throat swab or stool.

## **EPIDEMIOLOGY**

### **Source**

Humans are the reservoir for most viral agents.

### **Occurrence**

Worldwide. Peak activity in late summer and early fall related to enteroviruses and arboviruses; late winter activity related to mumps.

### **Mode of Transmission**

Varies, depending on the specific agent. Enteroviruses, for example, are transmitted through contact with nose or throat discharges or feces of infected persons, either through direct contact or by respiratory droplet spread.

### **Period of Communicability**

Varies, depending upon the specific agent. For enteroviruses, for example, the period of communicability occurs during the acute stage of illness and perhaps longer, since virus might persist in stools for 1-2 months.

### **Incubation Period**

2-21 days, depending upon etiologic agent.

## **PUBLIC HEALTH MANAGEMENT**

### **Case**

Physician assessment is required to establish diagnosis. All persons with symptoms suggestive of meningitis should be instructed to seek medical care immediately.

### Treatment

Primarily symptomatic and supportive (acetaminophen for fever and discomfort, moist heat for muscular aches, positioning for comfort). Antimicrobials may be administered until bacterial meningitis is ruled out.

### Isolation

Children exhibiting symptoms in a child care or school setting should be immediately removed from contact with other children and their parents contacted.

Section 3701-3-13 (N) of the Ohio Administrative Code states that: a "person with aseptic meningitis or viral meningoencephalitis shall be excluded from school or child care center until he or she is afebrile."

Enteric precautions are generally indicated for 7 days after the onset of illness unless a non-enteroviral diagnosis has been established.

### **Contacts**

Observation of close contacts of a person with aseptic meningitis is needed to detect secondary cases. Parents of contact children should be informed of possible exposure of their child (sample form letter included below).

### Child Care Centers

In addition to contacting the center an ill child attends and notifying contact children's parents, it is important to discuss aspects of disease transmission with the case child's caregivers. Children with aseptic meningitis may have virus present in the stool and/or respiratory secretions for several weeks following their return to the center. Strict attention to hygiene is essential if transmission to other children is to be avoided. Proper cleansing and disinfection of the diapering area and care in disposal of soiled diapers are essential. Objects mouthed by the case child must be cleaned and disinfected before use by another child. Cups and eating utensils should never be shared between washings. Caregivers must wash their hands carefully after contact with the child's stool or saliva.

### Athletic Teams and Bands

Outbreaks often occur among athletic teams, bands or other gatherings of young people. Often this is the result of shared drinking containers. A person with virus in his or her saliva can contaminate the nozzle of a water bottle and spread it to other team members when the bottle is passed around. Therefore, use of shared drinking containers, water bottles, ice buckets and ice towels should always be avoided. Individual drinking cups should be provided. Hand washing after toilet use and before eating should be emphasized.

### **Prevention and Control**

Careful personal hygiene is essential. Proper hand washing will decrease transmission of many diseases. Persons changing diapers must always dispose of diapers carefully and, if in child care settings, should clean and disinfect the diaper changing area after each use. Vaccination against mumps with the measles, mumps, and rubella (MMR) vaccine will prevent aseptic meningitis caused by the mumps virus.

SAMPLE LETTER TO PARENTS

Dear Parents:

A case of aseptic meningitis has been confirmed in a child attending (name of school or child care). Aseptic meningitis is generally caused by viruses and occurs primarily in young children. Meningitis is an irritation of the covering of the brain and spinal cord. Symptoms generally include fever, headache, lack of appetite, stomach pain, nausea and vomiting and stiff neck. These symptoms generally go away with no permanent damage after a few days to a week.

Should your child develop any of these symptoms in the next few weeks, contact your family doctor (or the health department, if you do not have a family doctor) and tell him or her that your child may have been exposed to aseptic meningitis and now is feeling unwell. You will be advised on further action needed, if any.

The virus is present in the bowel movement and saliva of infected persons. People become infected only by swallowing the virus, either from fecal material or from respiratory droplets from infected persons. Spread of the virus can be reduced and controlled with a few simple measures:

- Wash your hands thoroughly after changing a child's diaper.
- Wash your hands and your children's hands thoroughly after using the toilet.
- Wash your hands and your children's hands thoroughly before eating.
- Do not share drinking cups.

If you or your doctor has further questions, please contact the \_\_\_\_\_ health department at (phone number).

Sincerely,

\_\_\_\_\_(Child Care or School Official)

\_\_\_\_\_(Health Department)

## LYMPHOCYTIC CHORIOMENINGITIS

### AGENT

Lymphocytic choriomeningitis (LCM) virus; classified as an Arenavirus.

### SIGNS AND SYMPTOMS

May be nonspecific and of short duration, or may include clinical symptoms of meningeal irritation such as headache, anorexia and nausea. Severe encephalitis may occur. The prognosis is usually very good, even in severe cases.

### DIAGNOSIS

LCM virus may be isolated from blood, nasopharyngeal secretions, urine and CSF. Rise in antibody titer can be demonstrated in paired sera. Differentiation from other types of meningitis is necessary.

### EPIDEMIOLOGY

#### Source

Urine, saliva or feces of infected house or lab mice, guinea pigs, hamsters or monkeys.

#### Occurrence

Uncommon. Rare outbreaks have been traced to rodents sold as pets or laboratory animals. Most often affects young adults.

#### Mode of Transmission

Humans become infected by inhaling or ingesting dust or food contaminated by urine, saliva or feces of infected animals. No evidence of human-to-human transmission exists.

#### Period of Communicability

Infected rodents may carry the virus for life without symptoms.

#### Incubation Period

Probably 8-13 days; for meningeal symptoms, 15-21 days.

### PUBLIC HEALTH MANAGEMENT

#### Case

##### Investigation

Search the home or place of employment for presence of rodents.

##### Treatment

Symptomatic.

##### Isolation

Not required.

#### Contacts

No precautions required due to lack of human-to-human transmission.

#### Prevention and Control

Search for source of infection. Wear gloves for handling rodents or urine-contaminated traps. Keep foods covered. Eliminate rodents from places where humans live or recreate.

**What is meningitis?**

Meningitis is an illness in which there is inflammation of the tissues that cover the brain and spinal cord. Viral meningitis, which is the most common type, is caused by an infection with one of several types of viruses. Meningitis can also be caused by infections with several types of bacteria or fungi.

**What are the symptoms of meningitis?**

The symptoms of meningitis are not the same for every person. The more common symptoms are fever, severe headache, stiff neck, photophobia (when bright lights hurt the eyes), drowsiness or confusion, nausea and vomiting. In babies, the symptoms are more difficult to identify. They may include fever, fretfulness or irritability, difficulty in awakening the baby or refusal to eat.

**Is viral meningitis a serious disease?**

Viral meningitis is serious but rarely fatal in persons with normal immune systems. Usually, the symptoms last from 7 to 10 days and the person recovers completely. Bacterial meningitis, on the other hand, can be very serious and result in disability or death if not treated promptly. Often, the symptoms of viral meningitis and bacterial meningitis are the same. For this reason, if you think you or your child has meningitis, see your doctor as soon as possible.

**What causes viral meningitis?**

Many different viruses can cause meningitis. About 90% of cases of viral meningitis are caused by members of a group of viruses known as enteroviruses, such as coxsackieviruses and echoviruses. Herpesviruses and the mumps virus also cause aseptic meningitis.

**How is viral meningitis diagnosed?**

Viral meningitis is usually diagnosed by laboratory tests of spinal fluid obtained with a spinal tap. It can also be diagnosed by tests that identify the virus in other specimens collected from the patient, but these tests are not usually done.

**How is viral meningitis treated?**

No specific treatment for viral meningitis exists at this time. Most patients recover completely on their own, and doctors often will recommend bed rest, plenty of fluids and medication to relieve the symptoms of fever and headache.

**Can I get viral meningitis if I am around someone who has it?**

The viruses that cause viral meningitis are contagious. Enteroviruses, for example, are very common during the summer and early fall and many people are exposed to them; however, most infected persons either have no symptoms or develop only an upper respiratory infection or rash with low-grade fever. Typically, fewer than 1 of every 1000 persons infected actually develops meningitis. Therefore, if you are around someone who has viral meningitis, you have a moderate chance of becoming infected, but a very small chance of developing meningitis.

**How is the virus spread?**

Enteroviruses, the most common cause of viral meningitis, are most often spread through direct contact with respiratory secretions (e.g. saliva, sputum or nasal mucus). This usually happens by shaking hands with an infected person or touching something they have handled and then rubbing your own nose, mouth or eyes. The virus may also be found in the stool of persons who are infected. The virus is spread through this route mainly among

small children who are not yet toilet trained. It may also be spread this way to adults changing the diapers of an infected infant. The incubation period is usually between 3-7 days from the time you are infected until you develop symptoms. You can usually spread the virus to someone else beginning about three days after you are infected until about 10 days after you develop symptoms.

**How can I reduce my chances of becoming infected?**

Because most persons who are infected with enteroviruses do not become sick, it can be difficult to prevent the spread of the virus. If you are in contact with someone who has viral meningitis, the most effective method of prevention is to wash your hands thoroughly and often. In institutional settings, such as child care centers, washing objects and surfaces with a dilute bleach solution (made by mixing 1 capful of household bleach with 1 gallon water) can be a very effective way to inactivate the virus.