

Aseptic (Viral) Meningitis

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Aseptic meningitis may be caused by many different viruses. Non-polio enteroviruses account for 85-95% of all cases in which a pathogen is identified. Historically, non-polio enteroviruses have been divided into subgroups: group A coxsackieviruses, group B coxsackieviruses, echoviruses, and “newly identified” enteroviruses. In this document, the term “enterovirus” refers collectively to non-polio viruses in all four of these subgroups. Although 62 distinct serotypes of enteroviruses have been identified that can cause disease in humans, the 15 most commonly occurring serotypes account for more than 80% of isolates in the United States. In urban areas of the United States, usually one to three enteroviral serotypes predominate each season, and the prevalent serotypes usually change little from year to year.

Other viruses which can cause meningitis include: arboviruses (West Nile virus, St. Louis encephalitis virus), herpesviruses, mumps, measles, adenoviruses, HIV, varicella, and lymphocytic choriomeningitis virus. Readers should refer to other chapters of this manual or general communicable disease handbooks for further details on these other viruses.

B. Clinical Description

Meningitis is inflammation of the “meninges”, the membranes covering the brain and spinal cord. Symptoms generally develop over hours to several days. Headache (often severe) and fever are present in most cases; neck stiffness is also common. Nonspecific signs and symptoms include: nausea and vomiting, rash, diarrhea, cough, sore throat, and myalgias. Duration of illness is typically less than one week; no specific therapy is available.

Neonates (\leq 2 weeks of age) are at greatest risk for more severe disease and poor outcome.

Approximately 50-80% of nonpolio enteroviral infections are asymptomatic. Most symptomatic infections produce undifferentiated febrile illnesses accompanied by upper respiratory symptoms and lasting a few days. Aseptic meningitis resulting from enteroviral infection is an unusual manifestation of infection.

C. Reservoirs

Humans are the reservoir for enteroviruses.

D. Modes of Transmission

Enteroviruses are spread primarily from person-to-person by fecal-oral (probable predominant mode) and respiratory (droplet) routes, and from mother to infant in the peripartum period. These viruses may survive on environmental surfaces for periods long enough to allow transmission from fomites.

E. Incubation Period

The incubation period for enteroviruses is usually 3–6 days.

Colorado Communicable Disease Manual

ISSUED: 12/15/2004

REVISED: 12/15/2004

PAGE: 2

SUBJECT: Aseptic Meningitis

F. Period of Communicability or Infectious Period

Enteroviruses may be shed in respiratory secretions and feces for several days before onset of symptoms. Respiratory tract shedding of these viruses is usually for no longer than one week following illness onset; viral shedding in feces may continue for several weeks after symptoms have resolved. Maximum communicability, however, is believed to be early in illness when viral shedding is greatest. Viral shedding (and transmission of infection) can also occur without signs of clinical illness.

G. Epidemiology

Aseptic meningitis is reported throughout the year in Colorado, however, cases peak in the summer and early fall months (July – October). From 1996 through 2003, a median of 183 cases (range: 97 – 694) was reported annually in Colorado; however, the median for 2000 – 2003 was 293 cases. Rates are highest for children <1 year of age and approximately 43% of cases are <20 years of age.

Colorado aseptic meningitis statistics are available at the CDPHE website:

www.cdphe.state.co.us/dc/CODiseaseStatistics/index.html

2) CASE DEFINITION

Clinical Description

A syndrome characterized by acute onset of meningeal symptoms, fever, and cerebrospinal fluid (CSF) pleocytosis (*i.e.* elevated CSF white blood cell count), with bacteriologically sterile cultures.

Laboratory Criteria for Diagnosis

- No evidence of bacterial, fungal, or arboviral (e.g. West Nile virus, if tested) meningitis and
 - CSF white blood cell count $\geq 10/\text{mm}^3$, or
 - positive polymerase chain reaction (PCR) on CSF for a specific virus group (e.g. enterovirus or herpesvirus)

Case Classification

Probable: A clinically compatible case diagnosed by a physician as aseptic meningitis with a CSF white blood cell count $< 10/\text{mm}^3$ or unknown CSF cell count.

Confirmed: A clinically compatible case diagnosed by a physician as aseptic meningitis that is laboratory confirmed.

3) REPORTING CRITERIA

What to Report to the Colorado Department of Public Health and Environment (CDPHE) or local health agency

- Confirmed and probable aseptic meningitis cases.

Colorado Communicable Disease Manual

ISSUED: 12/15/2004

REVISED: 12/15/2004

PAGE: 3

SUBJECT: Aseptic Meningitis

- Aseptic meningitis cases should be reported within 7 days of diagnosis.
- Cases should be reported using the Colorado Electronic Disease Reporting System (CEDRS), or fax or telephone to CDPHE or local health departments. See below for phone and fax numbers.
- Suspected aseptic meningitis outbreaks should be reported to CDPHE or local health departments within 24 hours.

Purpose of Surveillance and Reporting

- To identify potential outbreaks
- To monitor trends in disease incidence

Important Phone Numbers and Web Resources

- CDPHE Communicable Disease Epidemiology Program
 - Phone: 303-692-2700 or 800-866-2759
 - Fax: 303-782-0338
 - After hours: 303-370-9395
- CDPHE Microbiology Laboratory: 303-692-3480
- Communicable Disease (CD) Manual website:
http://www.cdphe.state.co.us/dc/epidemiology/dc_manual.html

4) STATE LABORATORY SERVICES

Laboratory Testing Services Available

- Diagnostic testing for causative agents (e.g. enteroviruses, herpesviruses) of aseptic meningitis is typically performed by clinical laboratories or private reference laboratories.
- For outbreak investigations, the CDPHE laboratory can forward rectal swab and CSF specimens to CDC for enterovirus culture and PCR testing.
- For more information or assistance with testing for aseptic meningitis, contact the CDPHE Microbiology Laboratory.
- Note: Authorization from the CDPHE Communicable Disease Program is required before submitting rectal swab or CSF specimens to the CDPHE Microbiology Laboratory for forwarding to the CDC.

5) CASE INVESTIGATION

Individual cases of aseptic meningitis do NOT need to be routinely interviewed.

If an outbreak is suspected, please contact CDPHE for assistance.

A. Case Investigation / Forms

No routine case investigation. Complete the "Report a New Case" screens in CEDRS.

B. Identify and Evaluate Contacts

Not applicable (except as part of an outbreak investigation).

Colorado Communicable Disease Manual

ISSUED: 12/15/2004

REVISED: 12/15/2004

PAGE: 4

SUBJECT: Aseptic Meningitis

C. Reported Incidence Is Higher than Usual/Outbreak Suspected

If the number of reported cases of aseptic meningitis in your jurisdiction is higher than usual or an outbreak is suspected, consult with the CDPHE Communicable Disease Epidemiology Program. CDPHE can assist local public health agencies with the investigation of clusters and outbreaks of aseptic meningitis, and determine a course of action to prevent further cases.

6) DISEASE CONTROL MEASURES

A. Treatment

No specific treatment for enteroviral aseptic meningitis is available. Most patients completely recover on their own. Doctors often will recommend bed rest, plenty of fluids, and medication for relief of fever and headache.

B. Prophylaxis

No prophylactic treatment of close contacts is indicated.

C. Education

If appropriate, families and close contacts of sporadic cases may be educated that the most effective way to prevent the spread of these viruses is through proper handwashing and good general hygiene. It should be explained that most people with enteroviral infections do not develop meningitis but may have a variety of other symptoms (e.g. fever, respiratory, and gastrointestinal).

D. Managing Special Situations

Child care center or School

Any case of meningitis in a child care center or school often causes anxiety among staff members, parents and the community. There is no need for any medical treatment or prophylaxis for people who have been in contact with someone who has been diagnosed with aseptic meningitis caused by an enterovirus. The most effective way to prevent the spread of these viruses is through proper handwashing, especially after diaper changing, and good general hygiene; this should be communicated to the child care facility or school. It should be explained that most people with enteroviral infections do not develop meningitis but may have a variety of other symptoms (e.g. fever, respiratory, or gastrointestinal). Because enteroviruses may be spread from fomites, disinfection of objects and surfaces contaminated by feces or respiratory secretions should be stressed. A sample **Letter to parents** is located on the CD Manual website under "Aseptic meningitis".

E. Environmental Measures

No specific measures for sporadic cases other than what is discussed in Section 6(D).

Colorado Communicable Disease Manual

ISSUED: 12/15/2004

REVISED: 12/15/2004

PAGE: 5

SUBJECT: Aseptic Meningitis

REFERENCES

American Academy of Pediatrics. *2003 Red Book: Report of the Committee on Infectious Diseases, 26th Edition*. Illinois, Academy of Pediatrics, 2003.

Case Definitions for Infectious Conditions Under Public Health Surveillance.

www.cdc.gov/epo/dphsi/casedef/

CDC Website: www.cdc.gov → click on "Diseases and Conditions".

Heymann, DL, ed. *Control of Communicable Diseases Manual, 18th Edition*. Washington, DC, American Public Health Association, 2004.

Modlin JF. Introduction to Picornaviridae. In: Mandell GL, Bennett JE, Dolin R, eds. *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases – 5th ed*. Philadelphia: Churchill Livingstone, 2000;1888-1893.

Tunkel AR, Scheld WM. Acute Meningitis. In: Mandell GL, Bennett JE, Dolin R, eds. *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases – 5th ed*. Philadelphia: Churchill Livingstone, 2000;959-989.