Enterovirus Fact Sheet

The human enteroviruses are ubiquitous viruses that are transmitted from person to person via direct contact with virus shed from the gastrointestinal or upper respiratory tract. Poliovirus, the prototypical enterovirus, can cause a subclinical or mild illness, aseptic meningitis, or paralytic poliomyelitis. The nonpolio viruses (group A and B coxsackieviruses, echoviruses, enteroviruses) are responsible for a wide spectrum of diseases in persons of all ages, although infection and illness occur most commonly in infants.

For updated epidemiologic information on the 2014 enterovirus 68 outbreak, see Frequency.

Signs and symptoms

Clinical manifestations of enteroviral infection differ by viral type. Poliovirus syndromes can be abortive; nonparalytic; or paralytic, including spinal polio, bulbar polio, and polioencephalitis.

Polio

- Abortive polio manifestations include fever, headache, sore throat, loss of appetite, vomiting, and abdominal pain; neurologic symptoms are typically not reported
- Nonparalytic polio symptoms are similar to those of abortive polio but more intense; also, patients report stiffness of the posterior muscles of the neck, trunk, and limbs
- Paralytic polio is an acute febrile illness characterized by aseptic meningitis and weakness or paralysis of one or more extremities, along with weakness of one or more muscle groups
- Spinal polio comprises a prolonged prodrome, with features of aseptic meningitis followed in 1-2 days by weakness and, eventually, paralysis
- Bulbar polio involves cranial nerves, most commonly IX, X, and XII; patients accumulate pharyngeal secretions, have a nasal twang to the voice, and develop paralysis of vocal cords, causing hoarseness, aphonia, and, eventually, asphyxias
- Polioencephalitis is principally reported in children; unlike in other forms of polio, seizures are common and paralysis may be spastic

More than 90% of infections caused by nonpolio enteroviruses are asymptomatic or result only in an undifferentiated febrile illness. Symptomatic nonpolio virus infections include the following:

- Pleurodynia
- Myopericarditis
- Acute hemorrhagic conjunctivitis (AHC)
- Nonspecific febrile illness
- Aseptic meningitis
- Herpangina
- Hand-foot-and-mouth disease (HFMD)
- Encephalitis
Physical examination findings in enteroviral disease vary greatly depending on the type of illness and etiologic agent, as follows:

- **Nonspecific febrile illness** – Physical findings are those of general viral illness; mild pharyngeal erythema or conjunctivitis may be present.
- **Pleurodynia** – Paroxysmal chest pain is characteristic, has no prodrome, and begins with an abrupt onset of spasmodic pain, typically over the lower part of the rib cage or the upper abdominal region; fever often occurs within 1 hour of the onset of pain and subsides as the pain recedes; during paroxysms, respirations are rapid and shallow; the pain is reproducible, and patients appear healthy between paroxysms of pain; auscultation may reveal a pleural friction rub.
- **Myopericarditis** – The most common symptoms are dyspnea, chest pain, fever, and malaise; precordial pain may be sharp or dull and is often exacerbated by recumbency; a pericardial friction rub, if present, is transient; signs of congestive heart failure are present in 20% of cases.
- **AHC** – The hallmark physical findings include ocular erythema and subconjunctival hemorrhage, which seems to be more profuse in young patients; palpebral edema, chemosis, and ocular discharge may also be noted; preauricular lymphadenopathy is an associated finding.
- **Aseptic meningitis** – Meningeal signs (nuchal rigidity, bulging fontanelles in infants) may be present; rash may develop; approximately 5%-10% of infants experience complications such as febrile seizures, complex seizures, lethargy, coma, and movement disorders early in the course.
- **Encephalitis** – Manifestations range from lethargy, drowsiness, and personality change to seizures, paresis, coma, motor seizures, hemichorea, and acute cerebellar ataxia.
- **Herpangina** – Punctate macular lesions appear on the oral mucosa, most commonly the anterior tonsillar pillar and soft palate; the lesions evolve into vesicles and eventually ulcerate.
- **HFMD** – Vesicular lesions develop on the hands and feet and in the oral cavity; hands are involved more commonly than feet; the skin lesions consist of mixed papules; clear vesicles appear gray and are surrounded by erythematous rings; lesions are tender and resemble those of herpes simplex or varicella zoster infection; they resolve in approximately 1 week.

**Nonparalytic polio**

- Signs of meningeal irritation are present.
- Kernig and Brudzinski signs may be present.
- In infants, the head drop sign can be elicited.

**Paralytic polio**

- In early-stage disease, reflexes are normally active; a change in the character of reflexes precedes paralysis by 12-24 hours.
- Superficial reflexes decrease first, followed in 8-24 hours by loss of deep tendon reflexes.
- Paralysis is flaccid and characteristically asymmetric in distribution, with proximal limb muscles involved more than distal muscles and the lower extremities affected more commonly than the upper extremities.
Diagnosis

Diagnosis of enterovirus infections is often clinical. Laboratory diagnosis can be achieved with the following:

- Serological tests – Have multiple drawbacks; infrequently used
- Viral isolation by cell culture – CSF, blood, or feces can be sampled, depending on the site affected; yield is increased if multiple sites are sampled
- Polymerase chain reaction (PCR) – Provides rapid results; the best diagnostic test for use in CSF
- In myopericarditis, chest radiography, echocardiography, and ECG can be used for diagnosis

Treatment is as follows:

- Management is supportive and addresses symptoms (eg, bed rest, analgesics)
- No antiviral medications are currently approved for the treatment of enterovirus infections
- Immunoglobulins have been used therapeutically and prophylactically for enteroviral CNS infections in neonates and immunocompromised hosts, with mixed results.[7]
- Abortive and nonparalytic polio can be managed at home, but patients with paralytic polio require hospitalization