Enterovirus encephalitis

By Alina Ellerington, Encephalitis Society

What are enteroviruses?

Enteroviruses are a group of viruses that are transmitted from person to person via direct contact with the virus. They can cause a variety of illnesses from mild (febrile illness) to more serious illnesses (encephalitis). Each year, a billion or more people (more often infants and children) worldwide are affected by enteroviruses. Enterovirus infections are more common in the hotter and wetter months of the year.

Symptoms of enterovirus infections

Symptoms can vary. Most enterovirus infections do not present with symptoms. Others produce mild symptoms such as a short febrile illness with or without a sore throat, vomiting, and on occasions, diarrhoea.

Only rarely enterovirus infections result in severe disease in the heart (cardiomyopathy) or nervous system such as meningitis (inflammation of the lining of the brain and spinal cord), acute flaccid paralysis (limb weakness) or encephalitis (inflammation of the brain). Enterovirus encephalitis (EVE) can present as a meningoencephalitis or an encephalitis similar to herpes simplex encephalitis. Patients may show lethargy, somnolence, altered consciousness, personality change, hallucinations, stiff neck, ataxia, seizures or coma.

Diagnosis

A doctor may suspect enterovirus infection based on the symptoms and the risk factors (age, exposure, geographic locations). The diagnosis can be confirmed by using various tests (e.g. identifying the virus in samples taken from the patient: faeces, nose or throat secretions, cerebrospinal fluid (CSF) and/or blood or identifying antibodies against enteroviruses).
Treatment

Unfortunately, there is no specific antiviral medication for enterovirus infection. Treatment consists of medication to control fever and pain and/or intensive care therapies in severe cases. Intravenous immune globulin therapy has been used in chronic enterovirus infections in immunocompromised patients (patients with immune system weakened) with some success.

Prevention

Enterovirus infections are hard to prevent. People may not show symptoms and yet may be carrying and spreading the virus. Enteroviruses are very contagious. They spread through fecal-oral, respiratory and oral-to oral routes in crowded environments. For example if you touch hands with an infected person, or objects that have the virus on them, or change nappies or drink infected water. Perinatal (immediately before and after the birth) and post-natal transmission from mother to baby can occur.

Early diagnosis and effective management of identified cases are good measures of prevention. Careful attention to hand and personal hygiene can help limit outbreaks particularly after contact with secretions from an infected individual. The viruses are very resilient. They can be killed with standard disinfectant and heat, but they are resilient to freezing and chlorine.

Enteroviruses are a major public health concern given the increase in outbreaks of serious neurological diseases. These may lead to death and disability in survivors. Effective antiviral treatment and vaccination are still required to be developed.

Risk factors

Risk factors associated with enteroviruses infections are:

- Environmental: poor sanitation and crowded living conditions
- Age: young children are at a greater risk because of poor hygiene and lack of prior immunity
- Health: the immuno-compromised people (weak immune system) also have a high risk for acute infection.

Enterovirus encephalitis in newborns (neonatal)

Newborns are at a particular risk of developing meningo-encephalitis after infection with enteroviruses. Enterovirus infection in newborns may present with fever, poor-feeding, irritability, lethargy, jaundice, and ‘sepsis’. In a newborn with symptoms and signs suggestive of possible
Enterovirus infection, a lumbar puncture (LP) should be considered to obtain and examine the CSF. The illness can result in significant brain injury and long-term neurological and developmental problems.

**Human Enterovirus 71 (HEV71)**

HEV71 is a type of enterovirus that can cause large outbreaks of hand-foot-mouth disease (HFMD) and, in some children, meningitis, acute flaccid paralysis and a severe brainstem encephalitis with high mortality (death). Children with brainstem encephalitis usually present with myoclonus (quick, involuntary muscle jerk), tremor, ataxia (co-ordination, balance and speech difficulties), nystagmus (involuntary eye movement) and cranial nerve palsies. The outcomes of brainstem encephalitis are severe. Only a few children recover fully, most of them are left with permanent neurological sequelae.

HEV71 epidemics have caused great public health concern because of their size and the risk of children younger than five years old developing severe neurological disease and potentially death. HEV71 epidemics are seasonal, with the highest transmission rates occurring during warmer and wetter months. Infection control practices consist mainly of hand washing, disinfection, and isolation during epidemics.

---

Support our information

With our support, no one has to face encephalitis alone. Our advice and information is available free of charge to everyone affected but we are truly grateful when supporters feel able to contribute a little to the cost of these resources. Please make a donation today by visiting www.encephalitis.info/donate or text ENCE11 followed by an amount (£1, £2, £3, £4, £5 or £10) to 70070.

Thank you!

Disclaimer: We try to ensure that the information is easy to understand, accurate and up-to-date as possible. If you would like more information on the source material the author used to write this document please contact the Encephalitis Society. None of the authors of the above document has declared any conflict of interest which may arise from being named as an author of this document.