

Group II SS DNA viruses

Parvovirus B19

Primate erythroparvovirus 1, generally referred to as B19 virus, parvovirus B19 or sometimes erythrovirus B19, was the first (and until 2005 the only) known human virus in the family Parvoviridae, genus Erythroparvovirus.

B19 virus is most known for causing disease in the pediatric population; however, it can also affect adults. It is the classic cause of the childhood rash called fifth disease or erythema infectiosum, or "slapped cheek syndrome."



Laboratory Studies

Most patients with parvovirus B19 (B19V) infection do not require laboratory studies because symptoms are mild and the illness resolves over 5-7 days.

Parvovirus serology (anti-parvovirus B19 immunoglobulin M [IgM] and immunoglobulin G [IgG] antibodies) can be determined using enzyme-linked immunoassay (ELISA), radioimmunoassay, or immunofluorescence. Results of IgM testing are particularly difficult to interpret. Standardization between laboratories is lacking. Even in a single laboratory, sensitivity and specificity are partly determined by operator skills. High-level viremia in acutely infected persons may cause virus-antibody complexes, which will result in a false-negative IgM test result. In this setting, polymerase chain reaction (PCR) may be a better diagnostic modality.

PCR testing for parvovirus B19 is routinely available with increased sensitivity level. However, contamination and false-positive results are noted risks that lead to confusing interpretation. Low levels of B19 DNA may be detectable for more than 4 months in serum after acute infection and for years in other tissues.

Group III DS RNA viruses

Rotaviral enteritis, Rotaviral gastroenteritis

Rotavirus enteritis is the most common cause of severe diarrhoea among infants and young children. It is caused by Rotavirus, a genus of double-stranded RNA virus in the family Reoviridae. By the age of five, nearly every child in the world has been infected with rotavirus at least once. However, with each

infection, immunity develops, and subsequent infections are less severe; adults are rarely affected. There are five species of this virus, referred to as A, B, C, D, and E. Rotavirus, the most common, causes more than 90% of infections in humans, A

The virus is transmitted by the faecal-oral route. It infects and damages the cells that line the small intestine and causes gastroenteritis (which is often called "stomach flu" despite having no relation to influenza).

Diagnosis of human illness

Specific diagnosis of the disease is made by identification of the virus in the patient's stool. **Enzyme immunoassay (EIA)** is the test most widely used to screen clinical specimens, and several commercial kits are available for group A rotavirus. **Electron microscopy** and **polyacrylamide gel electrophoresis** are used in some laboratories in addition or as an alternative to EIA. **A reverse transcription-polymerase chain reaction (RT-PCR)** has been developed to detect and identify all three groups of human rotaviruses.

Group IV +SS RNA viruses

Poliomyelitis

Poliomyelitis, often called polio or infantile paralysis, is an infectious disease caused by the poliovirus. In about 0.5% of cases there is muscle weakness resulting in an inability to move. This can occur over a few hours to few days. The weakness most often involves the legs but may less commonly involve the muscles of the head, neck and **diaphragm**.

Post-polio syndrome (PPS, or post-poliomyelitis syndrome or post-polio sequelae) is a condition that affects approximately 25–50% of people who have previously survived an acute attack of poliomyelitis—a viral infection of the nervous system—after the initial infection. Typically the symptoms appear 15–30 years after recovery from the original paralytic attack, at an age of 35 to 60. Symptoms include acute or increased muscular weakness, pain in the muscles, and fatigue.

Virus Isolation

Virus isolation in culture is the most sensitive method to diagnose poliovirus infection. Poliovirus is most likely to be isolated from stool specimens. It may also be isolated from pharyngeal swabs. Isolation is less likely from blood or CSF.

To increase the probability of isolating poliovirus, collect at least two stool specimens 24 hours apart from patients with suspected poliomyelitis. These should be collected as early in the course of disease as possible (ideally within 14 days after onset).

Real-time reverse transcription PCR is used to differentiate possible wild strains from vaccine-like strains ("intratypic differentiation"), using virus isolated in culture as the starting material.

Partial genome sequencing is used to confirm the poliovirus genotype and determine its likely geographic origin.

Serologic testing

Serology may be helpful in supporting the diagnosis of paralytic poliomyelitis, particularly if a patient is known or suspected to not be vaccinated. An acute serum specimen should be obtained as early in the course of disease as possible, and a convalescent specimen should be obtained at least three weeks later.

CSF analysis

Detection of poliovirus in CSF is uncommon. CSF usually contains an increased number of leukocytes [from 10 to 200 cells/mm³ (primarily lymphocytes)] and a mildly elevated protein (from 40 to 50 mg/100 ml). These findings are nonspecific and may result from a variety of infectious and noninfectious conditions.



*"How can we continue to tolerate polio when we
have the technical expertise to get rid of it?"*

Dr. Harry Hull

