

Parvovirus B19 Infection (Fifth Disease)



Case Definition

Clinically compatible illness and laboratory evidence of infection (see below).

Reporting Requirements

Parvovirus infections are not reportable in Manitoba.

Clinical Presentation/Natural History

Twenty percent of infections are asymptomatic and severe complications are unusual, but infection in immunocompromised persons may lead to severe chronic anemia.

Erythema Infectiosum or Fifth Disease

Primarily a childhood disease characterized by the sudden onset of a maculopapular facial rash (“slapped cheek” appearance), followed by a generalized rash, usually without a fever. The constitutional symptoms are mild, lasting a few days, and do not recur (although the rash may recur for up to one to three weeks and occasionally much longer, particularly if skin is exposed to sunlight or heat). In adults, the rash is often atypical or absent, but arthralgia or arthritis may occur.

Transient Aplastic Crisis and Severe Anemia

This condition is preceded by a non-specific illness, often without a rash, and usually occurs in persons with anemias that require increased red cell production (sickle cell disease, thalassemia, etc.). Recovery occurs in seven to 10 days, although transfusion may be required.

Infection in Pregnancy

This can result in fetal infection and death, usually due to hydrops fetalis as a result of anemia. It occurs in less than 10% of fetal infections. Most infections in pregnant women do not lead to infection of the fetus, and many adults are immune to infection. There is no evidence that human parvovirus is teratogenic.

Etiology

Human parvovirus B19, a small single-stranded DNA virus.

Epidemiology

Reservoir and Source: Humans

Transmission: Likely through direct contact with respiratory droplets. Perinatal transmission from mother to fetus can occur.

Occurrence:

General: Worldwide. Most cases occur in school children. Infection can be sporadic or epidemic. In the United States, serologic evidence of past infection ranges from 5-10% in children under five years old, to 50% in adults. In temperate zones, epidemics tend to occur in winter and spring, with a periodicity of three to seven years in a given community. Rare nosocomial outbreaks have been reported.

Manitoba: Epidemics of parvovirus infection occur regularly, often in the spring.

Incubation Period: Variable; usually four to 14 days; may be as long as 20 days.

Susceptibility and Resistance: Susceptibility is universal. Protection appears to be conferred with development of parvovirus B19 antibodies. Attack rates among susceptibles can be high: 50% in household contacts; 10-60% in the daycare or school setting over a two- to six-month outbreak period; and more than 30% in a hospital setting. People with anemias and the immunocompromised are at risk for complications.

Period of Communicability: Persons with rash-illness alone were infectious during the prodrome of the illness; they are NOT infectious when they have the rash. Persons with aplastic crisis are infectious up to one week after onset of symptoms and immunocompromised persons may shed the virus for months to years.

Diagnosis

Diagnosis can be confirmed by detection of specific IgM antibodies against parvovirus B19 or by a four-fold rise in B19 IgG antibodies. IgM titres begin to decline 30 to 60 days after the onset of symptoms. B19 antigen and DNA can be detected in the acute sera and in autopsy tissues of infected fetuses by nucleic acid hybridization and other research techniques.

Key Investigations

- Identify pregnant women, persons with anemias such as sickle cell disease or thalassemia, and immunocompromised persons who are infected or at risk of infection.
- Investigate potential facility outbreaks in day-care centres, schools and health care facilities.

Control

Management of Cases:

- Persons with transient aplastic crisis in the hospital setting should be placed on droplet precautions.
- Exclude children from school or day care attendance while fever is present.
- **Specific treatment:** Intravenous immunoglobulin (IGIV) has been successfully used to treat chronic anemia in persistent infections but relapses have occurred in HIV-infected persons. Some obstetricians recommend close fetal monitoring (with ultrasound) when infection has occurred in early pregnancy, with intervention if there is evidence of hydrops fetalis.

Management of Contacts:

- Exposed pregnant women should be offered parvovirus B19 IgG and IgM antibody testing to determine susceptibility and to assist with counselling regarding risks to their fetuses.

Pregnant women with sick children are advised to avoid contact with respiratory secretions, wash hands frequently and avoid sharing eating utensils.

- Susceptible women who are pregnant (or who might become pregnant), and have continued close contact to people with parvovirus B19 infection (e.g., at school, at home, in health care facilities) should be advised of the potential for acquiring infection and the potential risk of complications to the fetus, as well as the need for good hygienic practices.

Preventive Measures:

- Prevention should focus on those with hemolytic anemias, immune deficiencies and non-immune pregnant women who may try to avoid exposure to potentially infectious people in hospital or outbreak settings.
- Pregnant women may be counselled about the very small risk of adverse outcome should they be exposed to someone who is infectious, and may be offered testing to determine if they are susceptible. They should be made aware of the lack of therapeutic interventions.
- Control measures for the general public are not available. Immunoglobulins have not yet had a trial for efficacy.
- In the health care setting, routine infection control measures may minimize the risk of transmission.
- In day-care centres, transmission may be minimized by handwashing after child care, cleaning of toys, dishes and utensils, and other good hygienic practices.

Management of Outbreaks:

- During community outbreaks (e.g., in school or daycare settings) persons with hemolytic anemias or immunodeficiencies and pregnant women should be informed of the possible risk of acquiring and transmitting infection.