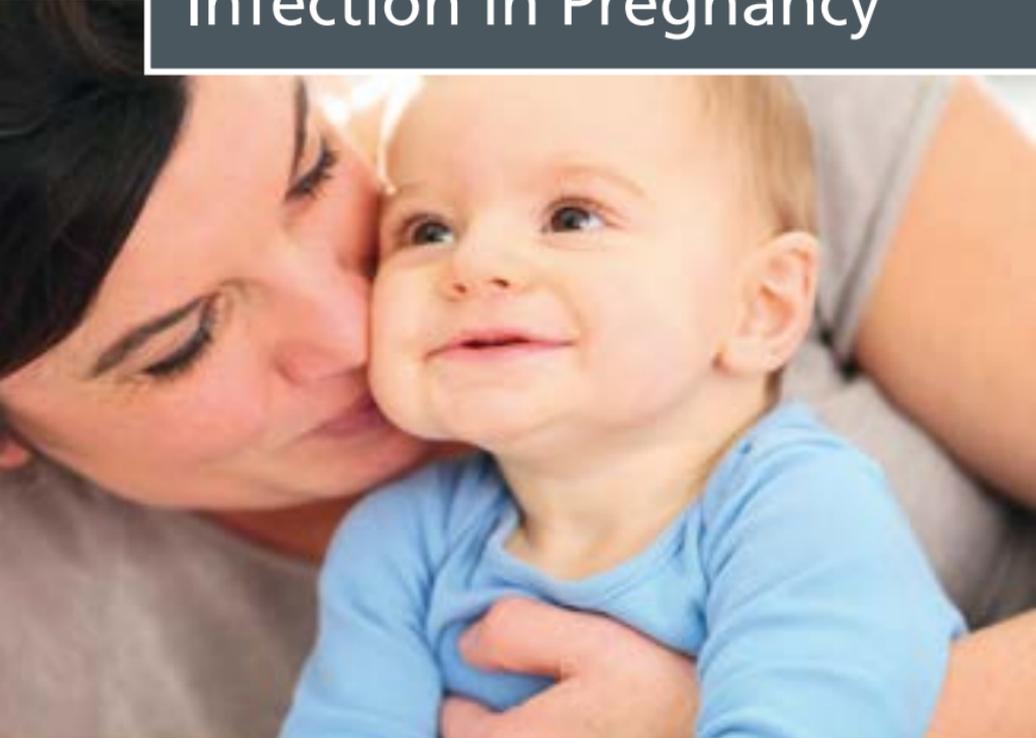


Parvovirus B19
Infection in Pregnancy



Information Booklet

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Parvovirus B19

Infection in Pregnancy

Parvovirus B19 (B19V) is the causative agent of the relatively benign childhood disease, erythema infectiosum (fifth disease). Maternal B19V infection can give rise to serious fetal complications during pregnancy.

Up to 50% of women are non-immune and susceptible to B19V infection. Infection may result in anemia, spontaneous abortion and/or hydrops fetalis. Early diagnosis of B19V infection will identify those at risk and may allow for early intervention therapy, thereby improving fetal survival.



WHAT IS IT

- Discovered in 1975 in asymptomatic blood donors.
- Small DNA virus ('parvum' being Latin for small).
- B19V only infects humans.
- Causative agent of erythema infectiosum (fifth disease of childhood).



WHAT IS THE SEROPREVALENCE OF B19V

- Approximately 60%.^{1,5}



HOW IS IT SPREAD

- Transmission is greatest during viremia and before symptoms arise.
- The virus is spread via aerosol droplets through the respiratory route.
- Transmitted by hand-to-mouth contact, blood or blood products and nosocomial infection.
- Can be spread transplacentally to the fetus during active maternal infection (33% transmission rate across the placenta).²
- During outbreaks, infection rates of 25 and 50% have been noted in the school and home, respectively.³

The Virus



WHEN DO INFECTIONS/OUTBREAKS OCCUR?

- Parvovirus B19 infection can occur at any time.
- The majority of outbreaks tend to be in the Winter and Spring time.



WHAT CELL TYPES ARE INFECTED?

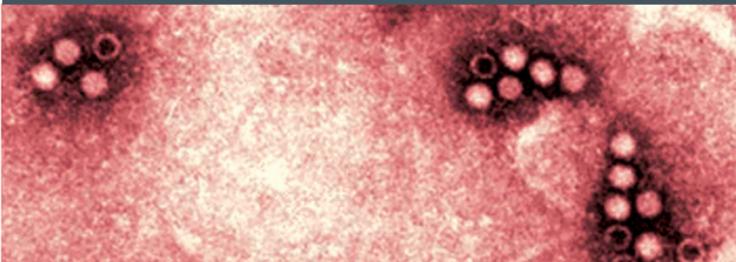
- Preferentially infects and replicates in erythroid cells.
- Following B19V infection, erythrocytes will lyse arresting erythropoiesis.
- Lymphocyte, granulocyte and platelet counts may also fall during infection.
- The B19V incubation period is usually 4-14 days.



WHO IS AT RISK OF INFECTION?

- All non-immune individuals (up to 50% of the population).
- A higher risk of infection exists in school and child care personnel.

*Parvovirus B19 under transmission electron microscope
Used with the permission of the Wadsworth Centre
New York State Department*





WHO IS AT RISK OF COMPLICATIONS DUE TO INFECTION?

- Pregnant women and their fetuses.
- Highest risk of infection for pregnant women is during epidemics and following exposure to infected children in the home.⁴
- Persons with pre-existing anemia and congenital or acquired immunodeficiencies.



WHAT IS THE INCIDENCE OF INFECTION IN PREGNANT WOMEN?

- It has been estimated that maternal B19V infection occurs in approximately 1 in every 400 pregnancies.⁵



CAN B19V INFECTION BE TREATED?

- High titre immunoglobulin treatment has been shown to be effective against the virus.
- The clinical manifestations of B19V infection can also be treated through intrauterine transfusion.
- Work is being carried out at present to produce a vaccine for B19V.

Blood Cells

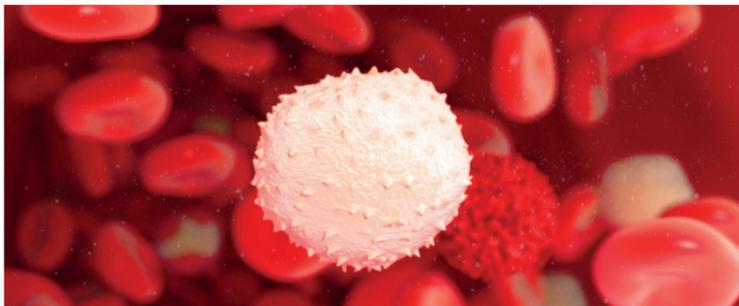


Clinical Manifestations



WHAT ARE THE CONSEQUENCES OF B19V INFECTION FOR THE FETUS?

- **FETAL ANEMIA:**
 - > B19V preferentially infects and replicates in erythroid cells.
 - > Active B19V infection causes fetal anemia.
 - > Anemia is an underlying factor in the development of hydrops, ascites and can lead to fetal loss.
- **NON-IMMUNE HYDROPS FETALIS (NIHF):**
 - > B19V infection induces severe anemia which leads to NIHF.
 - > The most common form of hydrops is NIHF (~75% of cases).
 - > 10-20% of cases of idiopathic NIHF are B19V-associated.^{7,8}
 - > Hydrops usually occurs 2-4 weeks after maternal B19V infection.⁹
 - > On average, there is a 10% risk of hydrops following B19V infection.¹⁰



- **FETAL LOSS:**

- > Up to 10% of B19V infections during pregnancy are associated with fetal loss.¹¹
- > The majority of fetal losses due to B19V infection occur in the 2nd trimester.
- > Fetal death usually occurs 4-6 weeks post infection but have been reported up to 12 weeks after symptomatic infection.¹



WHAT ARE THE CONSEQUENCES OF B19V INFECTION FOR THE MOTHER?

- Most pregnant women are asymptomatic.
- Some may experience exanthem and arthralgia.⁹



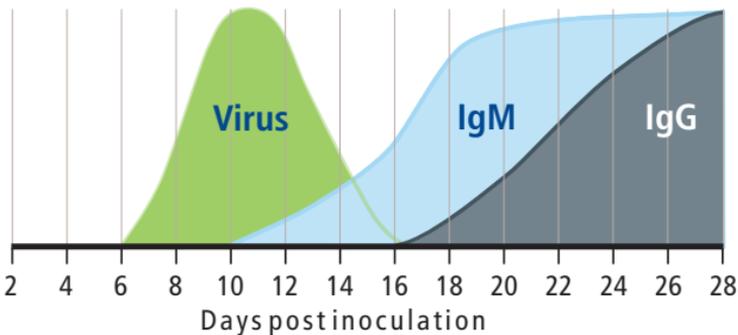
Diagnosis



WHAT IS THE IMMUNE RESPONSE FOLLOWING B19V INFECTION?

- IgM antibodies are present in 90% of patients approximately 2 weeks after infection.
- IgM levels can peak around 30 days post-infection and may last up to 4 months.
- IgG antibodies start to appear after 3-4 weeks and most probably persist for life.⁶

Antibody Response during Human Parvovirus B19 Infection



HOW CAN A WOMAN AT RISK OF INFECTION BE IDENTIFIED?

- Screening patients for their B19V antibody status will identify a patient at risk of infection.
- A variety of diagnostic assays are available to detect the presence of IgM and IgG antibodies in serum.



HOW ARE SEROLOGY ASSAY RESULTS INTERPRETED?

- A proposed Algorithm of Care for B19V antibody status is as follows:

Result	Indication	Action
IgG+, IgM-	Past Infection (immune)	Reassure Patient
IgG-, IgM-	No Past Infection (non-immune)	Repeat Testing
IgG+, IgM+	Recent Infection	Fetal Evaluation
IgG-, IgM+	Recent Infection	Fetal Evaluation

Patient Management



HOW CAN EFFECTIVE PATIENT MANAGEMENT BE ACHIEVED?

- 1 Through screening and assessing pregnant women
- 2 By treatment of women infected with B19V
- 3 Through education of pregnant women about B19V

1 HOW CAN SCREENING FOR B19V INFECTION BEFORE OR DURING PREGNANCY BE OF HELP?

- > Appropriate patient management is dependent on accurate B19V diagnosis.
- > Screening patients for B19V antibody status will determine the need for further follow-up.
- > An IgG-positive, IgM-negative patient should be reassured that B19V infection is not a cause for concern during their pregnancy.

2 WHAT ARE THE TREATMENT OPTIONS FOR B19V INFECTION DURING PREGNANCY?

- > For moderate to severe hydrops, fetal blood sampling may be appropriate.
- > If the reticulocyte count is high, marrow aplasia is already in the resolution stage and hydrops should resolve without therapy.
- > If hydrops develops, an intrauterine blood transfusion via cordocentesis should be considered.¹²
- > The severely anemic fetus with a low reticulocyte

- count may benefit from immediate transfusion.
- > High-titre intravenous immunoglobulin has been reported to be an effective therapy.¹²
 - > Ultra-sound exams should be performed every 1-2 weeks for up to 6-8 weeks.
 - > The algorithm of care shown on page 9 outlines treatment options based on serology assay results.

3 HOW WILL EDUCATION REGARDING B19V INFECTION BE OF HELP TO THE PREGNANT WOMAN?

- > It will allow them to avoid situations that involve possible risk of exposure.
- > Patient monitoring of fetal movement would also serve as an important aid to fetal surveillance in women beyond gestation week 28.

In summary, as in all care, diagnosis, screening and education are key to successful patient management. Selecting a test that ensures this is critical. Ask your lab about the Biotrin B19V assay.

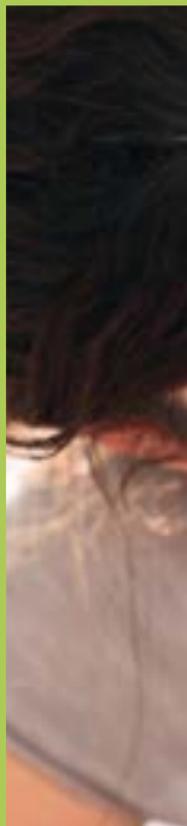


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