LAB NEWS

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Clinical Virology Laboratory Newsletter

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Availability of Parvovirus B19 DNA PCR

Parvovirus B19 is a common pathogen worldwide (1,2). The virus infects and lyses erythroid precursor cells leading to a drop in reticulocyte count and transient anemia. Other cells can also be infected and their function impaired, though they do not produce infectious virus. Parvovirus B19 infection is transmitted via the respiratory route, via parenteral blood products, and vertically from viremic mother to fetus. Antibody prevalence increases progressively throughout life, reaching 30-60% in adults and 85% in the elderly. Infections occur year-round, but peak in late winter and spring. Every 3-4 years, transmission may reach epidemic levels. The highest occupational risk is found in people caring for children, such as teachers, day care workers, and homemakers.

Clinical manifestations: Many infections are sub-clinical; however, a number of clinical manifestations can occur (see **Table** below). Erythema infectiosum (EI) or fifth disease is a common rash illness of childhood associated with primary B19 infection. Symmetric arthropathy can occur in childhood, but is more common in adults, and can last for weeks or months. Parvovirus infection is often mistaken for Lyme disease, and occasionally for systemic lupus or rheumatoid arthritis since transient ANA and RF can occur. Less common presentations are also observed (3). Both the rash of EI and the arthropathy are immune mediated (see **Figure** next page); therefore, IgM antibody is detectable when the patient first presents to the physician.

Transient aplastic crisis (TAC) is seen in patients with increased red cell turnover, due to B19 lysis of RBC precursors and a precipitous drop in reticulocyte counts. Patients with B19 aplastic crisis present earlier in infection, and serum IgM may not yet be detectable. Development of neutralizing antibody leads to eventual resolution of symptoms.

Immunocompromised hosts, such as patients with AIDS and hematologic malignancies, can fail to produce neutralizing antibodies. Persistent B19 infection with chronic anemia can result.

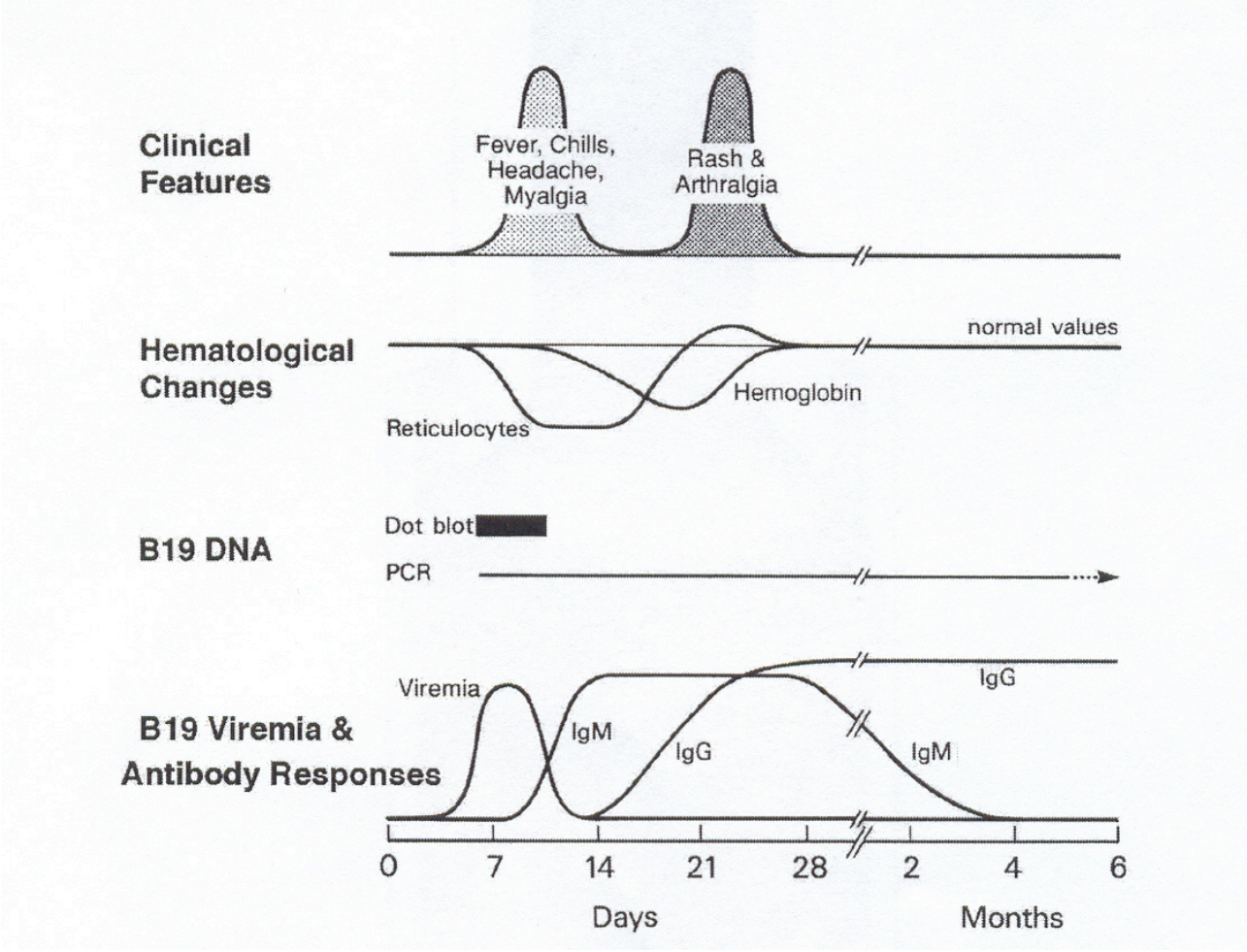
Host	Manifestation	Diagnostic test
Healthy host*	Common: Asymptomatic; erythema infectiosum (fifth disease); arthropathy Less common: Gloves and socks syndrome; thrombocytopenia; neutropenia; neurologic disease; myocarditis; hepatitis?	IgM and IgG antibodies for immune status, EI and arthropathy **PCR** in addition to antibody if unusual presentation, or if IgM and IgG are negative
B19 infection in pregnancy	Asymptomatic; non-immune hydrops fetalis; congenital anemia	IgM and IgG antibodies in mother **PCR** in amniotic fluid and fetal tissues
Immunodeficient host	Chronic red cell aplasia; virus-associated hemophagocytic syndrome	**PCR**; IgM and IgG antibodies
With increased red cell turnover	Transient aplastic crisis	**PCR** in early aplastic crisis

*Note: In healthy hosts, B19 DNA is detectable in blood by PCR for 2-6 months after initial infection (4).

Laboratory diagnosis: The Virology Laboratory began performing B19 DNA PCR in-house in September, 2004. PCR should be ordered as shown in the table above, and not for routine fifth disease or arthropathy.

Samples: Acceptable samples for PCR include serum, amniotic fluid, bone marrow, and fetal tissues.
Test method: Real-time TaqMan PCR protocol, published by Jordan (5,6) and validated at YNHH.
Test Availability: Test performed once a day, Monday-Friday, if sample received by 8 AM.
Time to result: Generally within one working day, excluding weekends and holidays (when staffing is limited and molecular tests are not performed).

Course of Parvovirus B19 Infection in Normal Hosts (from Ref 1)



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