Slapped cheek disease

How it affects children and pregnant women

BACKGROUND Slapped cheek disease, otherwise known as erythema infectiosum (EI) or 'fifth disease', is a common cause of fever and rash in children.
OBJECTIVE The clinical features in children, and the implications for pregnant contacts will be discussed in this article.
DISCUSSION Erythema infectiosum is usually a mild self limiting illness in children. Patients are unlikely to be infectious after the rash and other symptoms are present, and children do not need to be excluded from school or childcare. Infection in pregnant women under 20 weeks gestation can lead to miscarriage or hydrops, but in 50% of cases the fetus is unaffected. Pregnant women who are IgM positive require appropriate specialist referral and serial ultrasounds.

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Erythema infectiosum (EI), otherwise known as 'slapped cheek disease' or 'fifth disease', is caused by parvovirus B19.

Clinical features

Erythema infectiosum begins with a nonspecific prodrome of fever (15–30% of cases), malaise, myalgia and headache. Frequently, there is a distinctive rash, which has three stages:

1. Slapped cheek appearance (1–3 days) (*Figure 1*)
2. Maculopapular rash on proximal extensor surfaces, flexor surfaces and trunk which fades over several days with central clearing and then forms a reticular pattern (after seven days)
3. Reticular rash reappears with heat, cold and friction (weeks/months).

Arthralgia and arthritis occur infrequently in infected children, but are common in adults. Parvovirus B19 can also cause:

- asymptomatic infection
- mild respiratory tract illness without rash
- atypical rash which is rubelliform or petechial
- arthritis in adults (without other features of EI)
- chronic bone marrow failure in immunodeficient patients, and
- transient aplastic crisis in patients with haemolytic anaemia (eg. sickle cell disease).

Epidemiology

Parvovirus B19 is a common cause of infections in humans, who are the only known hosts.[1] It is transmitted via respiratory tract secretions, percutaneous exposure to blood or blood products, and vertical transmission from mother to fetus. Cases of EI can occur sporadically or as part of outbreaks, often at schools or childcare centers. The incubation period is 4–21 days.

Parvovirus B19 is very infectious. In 50% of cases, secondary spread to susceptible household members occurs,[2] and in schools, 20% of susceptible persons become infected.[2,3] However, 50–70% of adults in Victoria, are immune.[4] People with EI are most infective before onset of illness and are unlikely to be infective once the rash and other symptoms appear.

Diagnosis

Diagnosis in children is mainly clinical. In potentially infected women, serology and polymerase chain reaction can be performed. IgM is detectable within 1–3 weeks of exposure and usually remains detectable for 2–3 months. IgG indicates previous infection and immunity. Parvovirus DNA can be detected in serum after the acute viraemic phase for up to nine months in some patients, so it does not necessarily indicate acute infection.

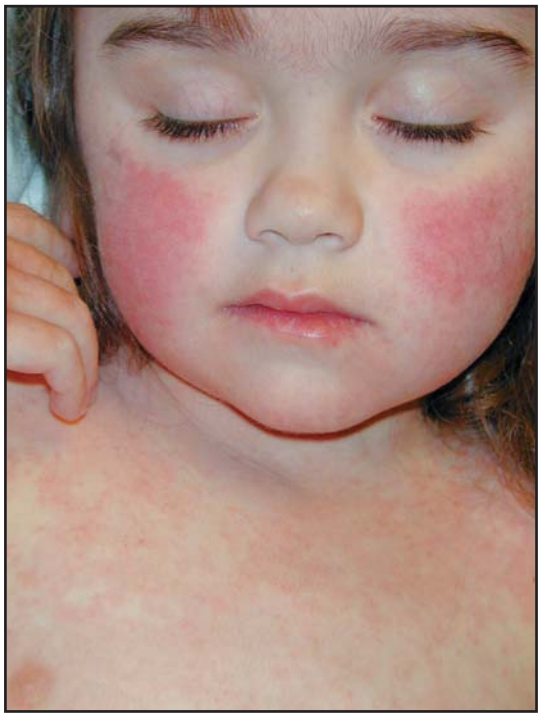

Figure 1. Slapped cheek appearance
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Table 1. Parvovirus and the pregnant patient

- Pregnant school teachers or childcare workers do NOT need to be excluded from work, even during an epidemic
- Pregnant women, who have been exposed to parvovirus, and those with an illness consistent with parvovirus, should be tested serologically
- If maternal infection is confirmed, the pregnancy should be monitored with serial ultrasounds. Referral to an appropriate specialist is recommended.

Table 2. Overall risks of parvovirus B19 infections during pregnancy[10]

	Any pregnant woman exposed to parvovirus	Pregnant woman with proven recent infection
Excess fetal loss in first 20 weeks	0.4-1% (1 in 100-1 in 250)	5% (1 in 20)
Death from hydrops or its treatment	0.05-0.1% (1 in 1000-1 in 2000)	0.6% (1 in 170)

Management

There is no specific treatment for parvovirus infection. For most children, only supportive care is needed. Children with EI do not need to be excluded from school or childcare.[5]

Implications for pregnant women

Pregnant women who are exposed to parvovirus B19 are at increased risk of severe anaemia and hydrops fetalis in the fetus (*Figure 2*). Approximately 50–60% of women of childbearing age immune.[4] The risk of infection in seronegative women is greatest in women exposed to an infected child at home (~50%).[2] The risk for childcare and primary school teachers exposed is 20–30%,[6] and the risk overall depends on exposure to children, but is approximately 10–20%.[2,3]

Routine antenatal screening for susceptibility to parvovirus infection is not indicated. It is not practicable to prevent exposure at home, and exclusion of pregnant women from work is not recommended (*Table 1*).

Pregnant women at risk should be offered serological testing to determine their susceptibility. Women who are IgM and IgG positive have had probable recent infection and should be referred for further testing and management. Women who are IgM positive, but IgG negative may have had recent infection. They should have repeat serology performed 2–4 weeks after exposure or if symptoms occur, and be managed accordingly.

Fetal risks following maternal infection

In 50% of cases of maternal infection, the fetus is unaffected.[7] Fetal damage only occurs if maternal infection occurs before 20 weeks gestation[8,9] (*Figure 3, Table 2*). The complications include:

- fetal loss in the first 20 weeks of pregnancy (15% compared with 5% in controls [women with varicella],[9] ie. 10% excess fetal loss)
- congenital abnormalities: <1% (anecdotal reports only)
- hydrops fetalis: following maternal infections at 9–20 weeks gestation (incidence is approximately 3%), and
- long term sequelae: chronic congenital anaemia after intrauterine transfusion is rare.[4]

Conflict of interest: none declared.

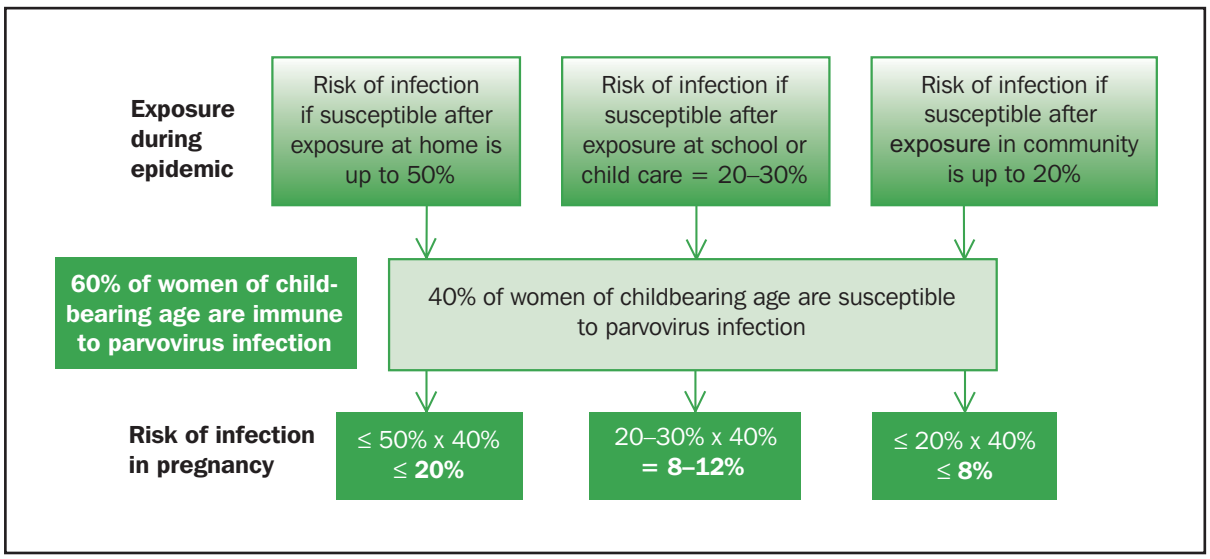

Figure 2. Parvovirus B19 infections during pregnancy: Risk assessment[10]

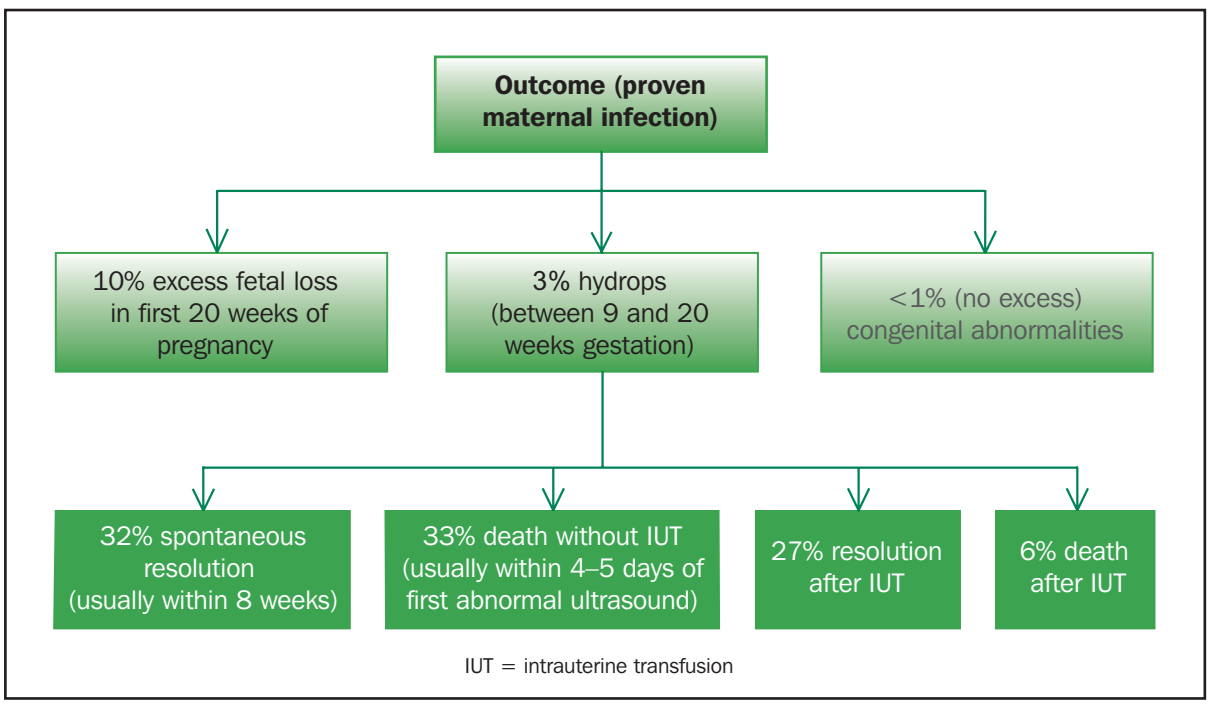

Figure 3. Outcomes of proven maternal parvovirus B19 infection[10]

SUMMARY OF IMPORTANT POINTS

- EI is caused by the highly infectious parvovirus B19.
- EI is a self limiting infection in children with 'slapped cheek' appearance followed by maculopapular rash.
- Arthralgia and arthritis is more common in infected adults.
- Fetal loss or hydrops can occur if a pregnant woman is exposed before 20 weeks (but 50% of fetuses are unaffected).
- Suspected cases in pregnant women should be confirmed by serology. IgM can be detected 1–3 weeks after exposure and remains detectable for 2–3 months.

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