OA Reablement service	OA Day Care	OA Residential Care	Domiciliary Services	DMH Day Services	DMH Supported Living	DMH Residential Services	EIA'd
✓	✓	✓	✓	✓	✓	✓	✓

I3
PARVOVIRUS B19
(Slapped Cheek Syndrome, Fifth Disease or Erythema Infectiosum)

The virus

Parvovirus B19 was discovered by chance in 1975 at the Central Public Health Laboratory during routine screening for hepatitis B of asymptomatic blood donors from the South London Blood Transfusion Centre. B19 happened to be the serial number of the parvovirus positive specimen. Parvovirus B19 is a single-stranded DNA virus belonging to the Parvoviridae family of viruses, which includes a number of animal parvoviruses such as the canine parvovirus and feline panleukopenia virus. Parvoviruses are species specific and B19 is the only known pathogenic human parvovirus. The virus is known to replicate in rapidly dividing erythroid progenitor cells. Other target cells are less well defined and may include myocardial tissue.

Clinical features of infection in healthy children and adults

The most common clinical presentation is erythema infectiosum (also called fifth disease and slapped cheek syndrome). It is characterized by a facial rash, which spreads to the trunk and limbs, usually preceded by a non-specific flu-like illness. Erythema infectiosum is clinically similar to rubella and the two diseases can be reliably distinguished only by laboratory tests. Parvovirus B 19 is also associated with rheumatological which can last for months in a small proportion of patients. Rarely, neurological and cardiac manifestations have been described. There are no symptoms in about 20-30 per cent of infections.

Infection in pregnancy

Most women who are infected with parvovirus B19 infection during pregnancy have a satisfactory outcome. However, gestational parvovirus B19 infection has been associated with adverse consequences such as fetal death and occasionally hydrops fetalis resulting from viral replication in the bone marrow. Spontaneous recovery of hydropic fetuses may occur with subsequent delivery of a normal infant. A prospective study of pregnant women in the UK estimated that parvovirus B19 infection in pregnancy caused fetal loss in 9 per cent of pregnancies in which infection occurs during the first 20 weeks and hydrops fetalis in 3 per cent of pregnancies in which infection occurred between 9 and 20 weeks. The risk of fetal loss in women with asymptomatic infection appears to be similar to that in women with a rash. Fetal infection without fetal loss or hydrops is common. There is no evidence of B19-

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associated congenital abnormality in the newborn or developmental abnormalities appearing later in childhood.

Other groups at risk

The replication of parvovirus B19 in red blood cell precursors in the bone marrow can lead to clinically significant red cell aplasia in certain patient groups. Thus, parvovirus B19 infection can cause transient aplastic crises (TAC) in patients with chronic haemolytic anaemias, e.g. sickle cell disease, betathalassaemia and hereditary spherocytosis. Persistent viral replication leading to red cell aplasia and chronic anaemia has been reported in immunodeficient patients. These have included patients on maintenance chemotherapy for acute lymphocytic leukaemia, patients with congenital immunodeficiencies, patients following organ transplantation, and those with HIV-related immunodeficiency.

Epidemiology and transmission

Parvovirus B19 infection is common and occurs world wide. The disease is not notifiable in the UK and surveillance relies on laboratory-confirmed cases. These show a 3-4 year epidemic cycle with a seasonal peak in the first half of each year. Recent epidemic years have been 1989-1990, 1993-1994 and 1997- 1998.

Infection is most common in children aged 6-10 years, but can occur at any age. Antibody prevalence studies have shown that approximately 60 per cent of adults in the UK have serological evidence of past infection with parvovirus B19. One attack is thought to confer lifelong immunity.

Respiratory secretions are involved in transmission. In human volunteers, serum and respiratory secretions become positive for B19 DNA 5-10 days after intranasal inoculation. The virus is transmitted effectively after close contact. Patients with TAC have an intense viraemia and are highly infectious. The virus can also be transmitted parenterally by some blood products (but not intramuscular immunoglobulins) and vertically from mother to fetus. Faecal-oral transmission has not been documented.

Studies of secondary illness in households suggest that the incubation period for clinical erythema infectiosum is 13-18 days, but can be as long as 20 days. Once the rash is present, the subject is no longer infectious.

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Prevention and Treatment: Immunisation and control policies

There is no vaccine available for the prevention of parvovirus B19 infection, although a recombinant preparation is at an early stage of development. The value of post-exposure prophylaxis with normal immunoglobulin has not been assessed. There are no clear guidelines at present on the control of parvovirus Bl9 infection. For most individuals, parvovirus Bl9 infection causes a mild, self-limiting illness and no intervention is required. Some of the management approaches that have been adopted in other situations are described below.

Outbreaks in the home, school and the workplace

When outbreaks of parvovirus B19 infection occur in environments where close contact occurs (e.g. at home or in day care centres), options for preventing transmission are limited. This is because the greatest risk of transmission occurs before the rash appears. Identification and exclusion of those with symptoms cannot therefore prevent spread in parvovirus B19 outbreaks. The efficacy of decontaminating toys and environmental surfaces has not been studied. In the USA, the Centers for Disease Control (CDC) have recommended hand washing as a simple procedure that may reduce the risk of transmission.

When outbreaks occur in schools or in the workplace, parents and employees should be advised of the risks both of transmitting and acquiring infection, and about the groups of people at risk of serious complications. The decision to avoid a school environment or workplace should be made by the individual after discussion and advice from his or her family members, general practitioner, occupational or public health doctor and employer.

Hospital outbreaks

In hospital outbreaks, strategies for limiting spread have centred upon reducing the risk of infection in people in high-risk groups, such as susceptible persons with haematological diseases or immunodeficiency, and susceptible pregnant woman. Normal immunoglobulin has been given prophylactically to high-risk patients in one hospital outbreak but its efficacy was not assessed. Other control measures that have been used include respiratory isolation of patients with TAC or chronic infection, exclusion of susceptible pregnant staff, patients and visitors from affected wards, testing of healthcare workers and allowing only B19 IgG positive staff to care for high-risk patients. An

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investigation of a nosocomial outbreak of parvovirus B19 in 1992 by the PHLS suggested that rigorous hand-washing procedures could be effective in limiting the spread of infection.

Pregnancy

Pregnant women should be given information about parvovirus B19, and those who have had recent exposure should have access to advice and serological tests. Blanket decisions on exclusions from work or transfer to a lower-risk area are not appropriate.

Serial fetal ultrasound is used for the diagnosis of hydrops fetalis. Intrauterine fetal transfusion, which requires specialist clinical expertise, is used for the treatment of hydrops fetalis in some centres and has been shown to improve survival. The specific management of gestational parvovirus B19 infection in individual cases is arrived at after consultation between the mother and the obstetrician. There is no indication for therapeutic termination of pregnancy or routine antenatal screening for maternal parvovirus B19 infection.

Treatment

For most individuals, no specific treatment is required for parvovirus B19 infection. Severe symptoms and complications may require appropriate measures. Joint pain may require analgesia, and severe anaemia in immunodeficient or haematological patients may require blood transfusion. Intravenous normal immunoglobulin has been successfully used in the treatment of chronic infection in immunodeficient patients.