

South Australian Perinatal Practice Guideline

Parvovirus in Pregnancy

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Note:

This guideline provides advice of a general nature. This statewide guideline has been prepared to promote and facilitate standardisation and consistency of practice, using a multidisciplinary approach. The guideline is based on a review of published evidence and expert opinion.

Information in this statewide guideline is current at the time of publication.

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Health practitioners in the South Australian public health sector are expected to review specific details of each patient and professionally assess the applicability of the relevant guideline to that clinical situation.

If for good clinical reasons, a decision is made to depart from the guideline, the responsible clinician must document in the patient's medical record, the decision made, by whom, and detailed reasons for the departure from the guideline.

This statewide guideline does not address all the elements of clinical practice and assumes that the individual clinicians are responsible for discussing care with consumers in an environment that is culturally appropriate and which enables respectful confidential discussion. This includes:

- The use of interpreter services where necessary,
- Advising consumers of their choice and ensuring informed consent is obtained,
- Providing care within scope of practice, meeting all legislative requirements and maintaining standards of professional conduct, and
- Documenting all care in accordance with mandatory and local requirements

Explanation of the aboriginal artwork:

The Aboriginal artwork used symbolises the connection to country and the circle shape shows the strong relationships amongst families and the Aboriginal culture. The horse shoe shape design shown in front of the generic statement symbolises a woman and those enclosing a smaller horse shoe shape depicts a pregnant woman. The smaller horse shoe shape in this instance represents the unborn child. The artwork shown before the specific statements within the document symbolises a footprint and demonstrates the need to move forward together in unison.



Australian Aboriginal Culture is the oldest living culture in the world yet Aboriginal people continue to experience the poorest health outcomes when compared to non-Aboriginal Australians. In South Australia, Aboriginal women are 2-5 times more likely to die in childbirth and their babies are 2-3 times more likely to be of low birth weight. The accumulative effects of stress, low socio economic status, exposure to violence, historical trauma, culturally unsafe and discriminatory health services and health systems are all major contributors to the disparities in Aboriginal maternal and birthing outcomes. Despite these unacceptable statistics the birth of an Aboriginal baby is a celebration of life and an important cultural event bringing family together in celebration, obligation and responsibility. The diversity between Aboriginal cultures, language and practices differ greatly and so it is imperative that perinatal services prepare to respectively manage Aboriginal protocol and provide a culturally positive health care experience for Aboriginal people to ensure the best maternal, neonatal and child health outcomes.

Purpose and Scope of Perinatal Practice Guideline (PPG)

The purpose of this guideline is to provide clinicians with information on the management of women exposed to or infected with parvovirus in pregnancy. It includes information on serological testing, monitoring and referral.

Parvovirus (slapped cheek syndrome)

Table of Contents

Purpose and Scope.....	1
Summary of Practice Recommendations.....	2
Abbreviations	2
Parvovirus	3
Clinical features.....	3
Route of transmission	3
Period of infectivity	3
Infection precautions	3
Risk assessment	4
Fetal effects of Parvovirus B19 infection ⁶	4
Antenatal diagnosis and management.....	5
Management plan for recent maternal Parvovirus infection	5
References	6
Acknowledgements	7
Document Ownership & History	8

Summary of Practice Recommendations

Routine antenatal screening for parvovirus is not recommended.

Women exposed to parvovirus during pregnancy should have maternal serology for IgG and IgM.

Women who are IgG negative should have repeat serology taken 2-4 weeks after exposure or if symptoms occur.

Women who are IgM positive and/or IgG positive up to 20 weeks gestation should be monitored by serial ultrasound every 1-2 weeks for 12 weeks to assess for fetal hydrops / anaemia.

Women with evidence of fetal anaemia should be referred to a Maternal Fetal Medicine specialist.

Abbreviations

ASID	Australasian Society for Infectious Diseases
DNA	Deoxyribonucleic acid
HPA	Health Protection Agency
OTIS	Organisation of Teratology Information Specialists
%	Percent
PCR	Polymerase chain reaction (PCR)
e.g.	For example



Parvovirus (slapped cheek syndrome)

Parvovirus

Parvovirus B19 is a single-stranded DNA virus.¹

Parvovirus B19 selectively infects and lyses human erythroblasts³ and is distinguished by the mild rash illness erythema infectiosum, also known as fifth disease (the fifth, pink-red rash to be described by physicians).

Most infections are mild, and most individuals recover completely from parvovirus B19 infection completely²; however, the infection may become persistent and cause chronic anaemia in pregnant women who are immunocompromised.³

In women with haematologic disorders characterised by decreased red blood cell production (thalassaemia) or increased red blood cell destruction (sickle cell disease), parvovirus B19 infection may cause an acute life-threatening red cell aplasia.³

Clinical features

- Erythema infectiosum ('slapped cheek' appearance or fifth disease)
- 30 – 40 % of infection is sub-clinical⁴
- Rubella-like rash
- Like rubella, can cause arthralgia or arthritis, particularly in adults (the hands are most frequently affected, followed by the knees and wrists)
- Arthralgia may develop a few weeks after infection

Route of transmission

- Person to person through direct contact with respiratory secretions and hand-mouth contact
- From mother to fetus
- Transfusion of blood and blood products

Period of infectivity

- Communicability is greatest (from about one week after exposure) and before onset of rash. Parvovirus B19 infection is probably not communicable after onset of the rash
- Those who develop aplastic crisis may be infectious up to one week after onset of symptoms. Immunosuppressed people with chronic infection and severe anaemia may be infectious for months to years
- Because cases of erythema infectiosum may occur over a time span of months, this suggests that B19 transmission is relatively inefficient³

Infection precautions

- Standard precautions
- Susceptible (parvovirus-specific IgG negative) pregnant health care workers should not care for women with known complicated parvovirus B19 infection (aplastic crisis) or chronic parvovirus B19 infection (immunocompromised)



Parvovirus (slapped cheek syndrome)

Risk assessment

Risk of maternal infection if susceptible after exposure to Parvovirus B19 ⁵			
	At home	At school or childcare	In the community
Risk of infection following exposure with contacts	≤ 50%	20 to 30%	≤ 20%
*Risk of infection in pregnancy if exposed	≤ 20%	8-12%	≤ 8%
*The risk is calculated based on the percentage of women of childbearing age susceptible (non-immune) to parvovirus being 40%			

Fetal effects of Parvovirus B19 infection⁶

Parvovirus infection can lead to spontaneous miscarriage and stillbirth. The spontaneous loss rate of fetuses affected with parvovirus B19 before 20 weeks' gestation is 13% and after 20 weeks' gestation is 0.5%. The reason for this difference is uncertain, but the largest study suggests it may be related to multisystem organ damage, which is possible even without anaemia or hydrops.

Currently, there does not appear to be any evidence that parvovirus B19 infection increases the risk of congenital anomalies in humans, though there have been case reports of central nervous system, craniofacial, musculoskeletal, and eye anomalies. In other species with other strains of parvovirus infection, congenital anomalies have been reported.

Parvovirus B19 has been associated with hydrops fetalis. The overall incidence in fetuses whose mothers have been infected by parvovirus between 9 and 20 weeks gestation is 3%.⁵

- Onset of hydrops is between 2-17 weeks (average 5 weeks) after maternal infection⁴.
- The risk of fetal hydrops appears to be greater when infection occurs earlier in pregnancy. Enders et al. observed the overall rate of hydrops to be 3.9% and 5.6% if maternal infection occurred between 9 and 20 weeks gestation in their study.⁷
- If a fetus develops hydrops, ultrasound signs include ascites, skin oedema, pleural and pericardial effusions, and placental oedema. It is estimated that parvovirus B19 infection accounts for 8% to 10% of non-immune hydrops, although some studies found molecular evidence of parvovirus B19 in 18% to 27% of cases of non-immune hydrops.
- Thrombocytopenia has been reported among up to 97% of hydropic transfused fetuses, with an incidence of severe thrombocytopenia ($< 50 \times 10^9$ platelets/L) up to 46%. This must be taken into account when the decision is made to perform a cordocentesis or intrauterine transfusion.
- Studies of long-term effects on children of maternal parvovirus B19 infection suggest most infants do not have long term adverse sequelae, but further research is needed.



Parvovirus (slapped cheek syndrome)

Antenatal diagnosis and management

Maternal serology	IgG +ve IgM -ve	IgG -ve IgM -ve	IgG -ve IgM +ve	IgG +ve IgM +ve
Interpretation	Immune	Susceptible (at risk of maternal infection)	Possible recent infection	Consistent with recent infection
Action	Reassurance of maternal immunity and low risk to fetus	Repeat testing IgM and IgG 2 to 4 weeks after exposure or if symptoms occur. If repeat testing demonstrates positive IgM and / or positive IgG these women should be monitored for possible fetal infection See Management plan for recent maternal Parvovirus infection below		See Management plan for recent maternal Parvovirus infection below

- IgM is detectable within 1-3 weeks of exposure and usually remains detectable for 2-3 months, but sometimes longer
- The absence of IgM does not exclude recent infection
- PCR for parvovirus can be performed on plasma but is generally unlikely to be positive after onset of rash (myalgias, fever and malaise coincide with peak viraemia)
- Amniocentesis for diagnosis of asymptomatic intrauterine fetal infection is not routinely recommended

Management plan for recent maternal Parvovirus infection

- Confirmed maternal infection based on serology before 20 weeks gestation
- No intervention is available to prevent fetal infection or damage
- The fetus should be monitored by serial ultrasound every 1-2 weeks for 12 weeks to assess for hydrops / fetal anaemia
- Refer to Maternal Fetal Medicine specialist experienced in fetal ultrasound, blood sampling and transfusion if signs of fetal hydrops



Parvovirus (slapped cheek syndrome)

References

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Useful web site:

SA Health – You’ve got what. In A to Z index under Parvovirus B19 infection (Fifth disease, slapped cheek, slapped face, erythema infectiosum). Available from URL: www.sahealth.sa.gov.au/youvegotwhat



Parvovirus (slapped cheek syndrome)

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Parvovirus (slapped cheek syndrome)

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