Clinical Practice Statement

Parvovirus-B19 in Pregnancy

1. Parvovirus B19 (B19V) can be transmitted by respiratory droplets, blood and blood product transfusions, or transplacental passage. The incubation period varies from 4 to 14 days after exposure but can last up to 3 weeks. Parvovirus infection can be asymptomatic in more than 50% of non-pregnant women and in almost 30–50% of pregnant women.

2. Systematic screening for parvovirus B19 infection is not recommended, and diagnostic testing (IgG and IgM antibody tests) is usually reserved for women with high suspicion of acute infection or known exposure.

3. Seroconversion among susceptible pregnant women in a non-epidemic situation is estimated to be around 1-3 % and in an epidemic, this increases to over 10% (with rates of 3-30% reported). The population-attributable risk of infection in susceptible pregnant women is estimated at about 55% from their own children and at 6% for occupational exposure.

4. Pregnant women exposed to, or who develop symptoms of, parvovirus B19 infection should be assessed to determine if they are susceptible to infection (non-immune) or if they have a current infection, by determining their parvovirus B19 IgG and IgM status at the time of exposure and also by testing the booking bloods.

5. Women should be counselled that around 60% of the pregnant population are immune and that even in cases of confirmed maternal infection, placental passage (vertical transmission) rates are 17-33%.

6. If parvovirus B19 IgG is present and IgM is negative, the woman is immune and can be reassured that she will not develop infection and that the virus will not adversely affect her pregnancy. Infection appears to confer lifelong immunity in immunocompetent hosts.

7. If an acute/recent B19V infection has been diagnosed, then the woman should be tested for the presence of B19V DNA in blood. IgM antibodies are detected early, by the end of the first week of infection and can persist for 3-6 months. Parvovirus B19 IgG appears a few days after IgM appears and usually remains present for life.

8. If recent maternal B19V infection is confirmed, the virus may be transmitted to the fetus (17 to 33% risk) and may cause anaemia leading to non-immune hydrops. The occurrence of hydrops is most prevalent in the second trimester and is rare near term.

9. The greatest period of risk to the fetus is in the first 20 weeks of pregnancy. Infection during this time can lead to complications such as fetal anaemia and sometimes fetal loss (miscarriage or stillbirth). There is a 5-10% risk of fetal loss if women develop this infection in the second trimester (with or without evidence of fetal hydrops). After 20 weeks of pregnancy the risk of the baby developing severe anaemia is much lower, and the fetal loss rate is also lower (0.5%), but investigations are undertaken in all cases.

10. Most intrauterine fetal deaths (80%) are observed up to 4 weeks after maternal infection, and most fetal deaths occur in those infected before 20 weeks. The highest risk of fetal death is observed in infections between 9 and 16 weeks, and the highest risk for hydrops is in infections

between 13 and 20 weeks. If infection occurs beyond 20 weeks, the risk of fetal hydrops is 1% or less. The most important determinant of mortality and adverse perinatal outcomes is the presence of fetal hydrops, with a mortality rate of approximately 29%.

11. If recent B19V infection is confirmed, the woman should be referred to a maternal-fetal medicine specialist to further interpret the results. The woman should be counselled regarding risks of fetal transmission, fetal loss and hydrops. Serial ultrasounds (weekly or two-weekly) should be performed up to 8 to 12 weeks after infection to detect the development of anaemia or hydrops.

12. Fetal anaemia can be diagnosed by Doppler ultrasound measurement of the peak systolic velocity in the middle cerebral artery (MCA-PSV). This measurement is possible from the late first and early second trimester, in combination with other sonographic signs such as nuchal/generalised skin oedema, ascites, pleural effusions, echogenic bowel, cardiomegaly, placentomegaly and polyhydramnios.

13. If fetal anaemia / fetal hydrops develops, referral to a maternal-fetal medicine specialist in a tertiary centre should be made and consideration should be given to fetal blood sampling and intravascular transfusion, taking account of gestational age and clinical presentation. Spontaneous resolution of the infection may occur in approximately 50% of non-hydropic fetuses but is rare (<5%) in hydropic fetuses.

14. There does not appear to be any evidence that parvovirus B19 infection increases the risk of congenital anomalies. There is no evidence from observational prospective studies of women with infection and their infants that infection in pregnancy results in long-term adverse sequalae, although this may depend on the severity of the B19V fetal infection.

15. If both parvovirus B19 IgG and IgM are negative (and the incubation period has passed), the woman is not immune and has not developed the infection.

16. If both parvovirus B19 IgG and IgM are negative, the woman is not immune and therefore susceptible to infection. If she has had a recent exposure to the virus, and may be incubating the infection, it is suggested that the IgG and IgM tests be repeated 4 weeks later. If exposure is ongoing, serology may be repeated every 4 weeks.

17. During an outbreak, parents of preschool and school children as well as employees should be informed of the risk of infection and its management. Each woman should be counselled about her individual risk, based on her risk of infection, gestational age, and other obstetric considerations. Specific local and national occupational health guidance (refer to HPSC) should be followed.

18. All healthcare providers and patients should follow recommended infection control practices to prevent the spread of parvovirus B19 and follow core prevention strategies.

References

Health Protection Surveillance Centre (HPSC).
https://www.hpsc.ie/a-z/other/parvovirus/

Clinical Practice Guideline: Parvovirus B19 Exposure / Infection during Pregnancy. Institute of Obstetricians and Gynaecologists, Royal College of Physicians of Ireland, and Health Service Executive. 2014 (*archived*).

Crane J, Mundle W, Boucoiran I; MATERNAL FETAL MEDICINE COMMITTEE (2014). Parvovirus B19 infection in pregnancy. *J Obstet Gynaecol Can. 2014 Dec;36(12):1107-1116. doi: 0.1016/S1701-2163(15)30390-X*

Bascietto F, Liberati M, Murgano D, Buca D, Iacovelli A, Flacco ME, Manzoli L, Familiari A, Scambia G, D'Antonio F (2018) Outcome of fetuses with congenital parvovirus B19 infection: systematic review and meta-analysis. *Ultrasound Obstet Gynecol 52(5):569–576. doi. org/ 10. 1002/ uog. 19092*

de Jong EP, Walther FJ, Kroes AC, Oepkes D (2011) Parvovirus B19 infection in pregnancy: new insights and management. Prenat Diagn 31(5):419–425. doi. org/ 10. 1002/ pd.2714

Dijkmans AC, de Jong EP, Dijkmans BA, Lopriore E, Vossen A, Walther FJ, Oepkes D (2012) Parvovirus B19 in pregnancy: prenatal diagnosis and management of fetal complications. *Curr Opin Obstet Gynecol 24(2):95–101. doi. org/ 10. 1097/ GCO.0b013 e3283 505a9d*

Dittmer FP, Guimarães CM, Peixoto AB, Pontes KFM, Bonasoni MP, Tonni G, Araujo Júnior E (2024). Parvovirus B19 Infection and Pregnancy: Review of the Current Knowledge. *J Pers Med. 2024 Jan 26;14(2):139. doi: 10.3390/jpm14020139.*

Enders M, Weidner A, Zoellner I, Searle K, Enders G (2004) Fetal morbidity and mortality after acute human parvovirus B19 infection in pregnancy: prospective evaluation of 1018 cases. *Prenat Diagn 24(7):513–518. doi. org/ 10. 1002/ pd. 940.*

Gigi CE, Anumba DOC (2021). Parvovirus b19 infection in pregnancy - A review. *Eur J Obstet Gynecol Reprod Biol. 2021 Sep;264:358-362. doi: 10.1016/j.ejogrb.2021.07.046.*

Kosian P, Hellmund A, Geipel A, Bald R, Geist OM, Böckenhoff P, Jimenez-Cruz J, Deja M, Strizek B, Berg C, Gembruch U (2023). Intrauterine transfusion in 103 fetuses with severe anemia caused by parvovirus infection. A multicenter retrospective study. *Arch Gynecol Obstet. 2023 Jul;308(1):117-125. doi: 10.1007/s00404-022-06712-z.*

Jensen IP, Thorsen P, Jeune B, Møller BR, Vestergaard BF (2000). An epidemic of parvovirus B19 in a population of 3596 pregnant women: a study of sociodemographic and medical risk factors. *BJOG: An International Journal of Obstetrics & Gynaecology. 2000;107(5):637-43. doi: 10.1111/j.1471-0528.2000.tb13306.x*

Lamont RF, Sobel JD, Vaisbuch E, Kusanovic JP, Mazaki-Tovi S, Kim SK, Uldbjerg N, Romero R (2011). Parvovirus B19 infection in human pregnancy. *BJOG: An International Journal of Obstetrics & Gynaecology* 2011 Jan;118(2):175-86. doi: 10.1111/j.1471-0528.2010.02749.x

Levy R, Weissman A, Blomberg G, Hagay ZJ (1997) Infection by parvovirus B 19 during pregnancy: a review. *Obstet Gynecol Surv 52(4):254–259. doi. org/ 10. 1097/ 00006 254- 19970 4000- 00023*

Schwarz TF, Roggendorf M, Hottentrager B, Deinhardt F, Enders G, Gloning KP, Schramm T, Hansmann M (1988) Human parvovirus B19 infection in pregnancy. *Lancet 2(8610):566–567. doi. org/ 10. 1016/ s0140- 6736(88) 92684-0*