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Parvovirus B19 (B19V)

Parvovirus B19 (B19V) is a human virus belonging to the Parvoviridae family, genus Erythroparvovirus. It is a small, non-enveloped, single-stranded DNA virus (5,600 base pairs) which preferentially replicates in bone marrow erythroid progenitor cells (EPCs). There are 3 B19Vs genotypes: 1, 2 and 3. Although genotype 1 is ubiquitous worldwide, genotype 3 is predominantly found in West Africa, whereas genotype 2 is rare, non-circulating and only sporadically detected in older populations in Europe.

B19V infection is endemic worldwide and is the causative agent of a mild and highly contagious childhood illness known as slapped cheek disease, also known as fifth disease or erythema infectiosum. Primary transmission routes include respiratory secretions and hand-to-mouth contact, as well as blood transfusion or transplacental transmission. Immunity usually persists life-long, as evidenced by positive immunoglobulin (IgG), but reinfection/reactivation has been recorded in immunocompromised individuals.

Although most infections are asymptomatic, B19V infection may result in severe, life-threatening complications in some individuals (Reno ML, 2022). Infection with B19V during pregnancy may cause hydrops foetalis, congenital anaemia, miscarriage or stillbirth, in particular when infection occurs within the first 20 weeks of pregnancy. B19V may also cause persistent anaemia usually, but not exclusively, in immunocompromised patients, transplant patients, and infants. In individuals with haemoglobinopathy (eg sickle cell disease, thalassaemia), B19V can cause a severe, life-threatening transient aplastic crisis which may require blood transfusion. B19V has also been linked to arthralgia and severe joint disease, as well as to various organ complications (heart, kidney, liver, CNS). Co-infection with HHV-6 has also been shown to lead to fatal myocarditis in some cases (Rohayem, 2001).

Micropathology Parvovirus B19 Assay

At Micropathology Ltd., we offer a hydrolysis probe-based assay for the detection and quantitation of B19V using a with real time visualisation of the fluorescence increase on a Roche LightCycler 480 PCR instrument.

UKAS-accredited sample types for quantitation include EDTA whole blood, serum, plasma, CSF, amniotic fluid and bone marrow. Tissue samples are UKAS-accredited for qualitative results. Other sample types can be tested but these will be reported with the caveat ‘Assay for this organism is not UKAS accredited for this sample type’.

A full list of appropriate sample types for parvovirus B19 detection can be found in the Laboratory User Handbook.

References

Reno ML, Cox CR, Powell EA. Parvovirus B19: a Clinical and Diagnostic Review. Clinical Microbiology Newsletter. 2022. Volume 44, Issue 12. 107-114.
Rohayem J, Dinger J, Fischer R, Klingel K, Kandolf R, Rethwilm A. Fatal myocarditis associated with acute parvovirus B19 and human herpesvirus 6 coinfection. J Clin Microbiol. 2001 Dec;39(12):4585-7. Burrel S., Deback C., Agut H., and Boutolleau D. (**2010**). Genotypic