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Group B *Streptococci* (*Strep. agalactiae*) testing

Streptococcus agalactiae, also known as Group B *Streptococcus* (GBS) are facultative anaerobic Gram-positive cocci which form part of the normal flora of the lower GI tract and up to 28% of women in the UK are colonised in the genital tract without any associated symptoms[1].

Although GBS colonisation is not normally associated with disease in non-pregnant women, GBS can cause infection in pregnant women and potentially devastating early onset disease in newborns. In pregnant women, GBS infection is known to cause urinary tract infection, endometritis, wound infection and associated amnionitis which can lead to neonatal sepsis, pneumonia or meningitis once the baby is born[2].

Neonatal infection refers to infection occurring during the first four weeks of life. Infection may be superficial and localised (eg conjunctivitis, pustules, skin infection), deep and localised (pneumonia, septic arthritis, meningitis) or systemic (septicaemia). Presentation differs according to age at onset: early onset disease is more likely than late onset to present with generalised sepsis[2].

Early onset disease occurs in the first six days (usually within 48 hours) of life and is caused by infection ascending from the maternal genital tract or, very rarely, via the placenta. Only a small percentage of infants colonised with this organism develop early onset disease. Early infections tend to be associated with pneumonia and septicaemia and may be confused with respiratory distress syndrome.

Late onset disease occurs after the first six days and is associated with acquisition through vertical or nosocomial transmission or from the external (eg hospital) environment. GBS initially colonise the superficial sites and upper respiratory tract progressing to cause widespread sepsis. Late infection is more likely to be associated with meningitis.

Since 2001 there has been a significant increase in the incidence of invasive GBS cases, with early-onset GBS disease at 0.54 cases/1000 live births and a mortality rate of 4.7% recorded in the UK in 2014. Increases in erythromycin and clindamycin resistance have also been noted over this period, leading to a change in use if second line agent intrapartum prophylaxis. The incidence of infection is known to increase with low birth weight or prematurity.

Routine screening for antenatal carriage of GBS is controversial and varies in different countries. In the UK, universal antenatal screening is currently **NOT recommended**. However, the Royal College of Obstetricians & Gynaecologists recommends screening in women in whom GBS was detected in a previous pregnancy at 35-37 weeks of gestation or 3-5 weeks prior to the anticipated delivery (eg. identified during urine culture) and to treat any women where chorioamnionitis is suspected[3].

In men and non-pregnant women, especially those with underlying disease, more common infections with GBS include: skin or soft tissue infection, bacteraemia, meningitis, genitourinary infection, balanitis (in men), endocarditis, arthritis, otitis media, conjunctivitis and pneumonia.

Identification of GBS is typically through culture where smooth circular colonies demonstrate a small zone of β-haemolysis on blood agar; characteristic Gram staining of Gram-positive cocci in chains; use of Lancefield grouping (Group B) and MALDI-TOF. Clients may wish to send specimens for molecular detection of GBS when a very rapid detection is required; where there is clinical suspicion of infection but no organism has grown eg. where antibiotics have been given prior to specimen collection; or where clarification of the identification of an organism is sought[4].

At Micropathology Ltd, we run two single round PCR assays to detect Group B *Strep*. The first targets the *Strep. agalactiae* CAMP factor (*cfb*) and the second is less specific, amplifying the C5a peptidase region (*scpB*) in Group A *Strep.*, Group B *Strep.* and Group G *Streptococcus* (*S. dysgalactiae*).

UKAS accredited sample types for this assay are CSF, EDTA whole blood and tissue.

Other samples may be tested and reported along with an appropriate caveat stating that the assay is not UKAS accredited for testing of alternative sample types.

References

[1]Shabayek, S. and Spellerberg, B., (2018) 'Group B streptococcal colonization, molecular characteristics and epidemiology', *Frontiers in microbiology,* 2018; 9: 437.

[2]Raabe VN, Shane AL. (2019) Group B Streptococcus (*Streptococcus agalactiae*). Microbiol Spectr; 7(2):10

[3]Public Health England. (2018). Detection of Carriage of Group B Streptococci (Streptococcus agalactiae). UK Standards for Microbiology Investigations. B 58 Issue 3.1. https://www.gov.uk/uk-standards-for-microbiology-investigations-smi-quality-and-consistency-in-clinical-laboratories

[4]UK Standards for Microbiology Investigations Identification of Streptococcus species, Enterococcus species and morphologically similar organism v.4 UK SMI ID 4: identification of Streptococcus species, Enterococcus species and morphologically similar organisms (publishing.service.gov.uk)