Group B Strep: where we are and where we're heading

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ORIGINAL

There is just enough conflicting information circulating to make the topic of group B Strep very confusing. To help unravel this perplexity, the key problem — early-onset group B Streptococcal (EOGBS) infection — must be clearly defined. The current UK prevention guidelines also need to be clarified, including how they are being used, and the myths around testing for group B Strep (GBS) carriage and the use of antibiotics dispelled.

What is it?

Group B Streptococcus is a naturally occurring bacterium that normally colonises the bowel of 20–30% of all adults (women and men) without symptoms or side effects. It is found in the intestines as part of the normal 'gut' flora. In a fifth of women of childbearing age, it is also found in the vagina living as a commensal — an organism that lives with or in another without causing any harm. It is not a sexually transmitted disease. While the presence of this bacterium is normal and does not require treatment on its own, in pregnancy it merits more attention. There is a risk, when the pregnant woman is a carrier, of passing the bacteria on to her baby around the time of labour, leading to GBS infection in about one in 300 cases where no preventative measures are taken. In many more instances, the baby is simply 'colonised' — it acquires the bacteria, but the GBS does not invade the tissues of the baby and so it is not infected.

Although not common, GBS is the most common cause of life threatening infection in newborn babies, and of meningitis in babies up to three months. At least 500 babies a year in the UK become infected, most commonly with early-onset GBS infection (developing in the first six days of life) and less frequently late-onset GBS infection (developing in babies aged 7–90 days). We know from Heath *et al* (2004) that one in ten babies sick with GBS infection dies and at least one in 20 suffers long-term problems. Five in ten of the survivors of GBS meningitis suffer long-term mental and physical problems, including cerebral palsy.

UK guidelines for preventing GBS infection in newborn babies

Although there are strategies effective at preventing **early**-onset group B Strep (EOGBS) infection, there are currently no proven methods to prevent **late**-onset group B Strep infection. The focus of this article is therefore EOGBS infection.

The likelihood of a baby developing EOGBS infection can be reduced substantially by the mother receiving intrapartum antibiotic prophylaxis, typically penicillin. The main controversy lies in selecting which women should be offered antibiotics.

The Royal College of Obstetricians and Gynaecologists (RCOG) recommends a 'risk factor' approach to preventing EOGBS infection. It describes six situations in which babies are more likely to develop GBS infection (RCOG 2012).

The guidelines state that intrapartum antibiotic prophylaxis should be offered to women at the start of labour where the following risk factors are present:

1. If GBS carriage was detected during the current pregnancy.
2. If GBS was found during the current pregnancy from a urine sample. (Women with GBS urinary tract infection during pregnancy should receive appropriate treatment at the time of diagnosis as well as the offer of intravenous antibiotics in labour).
3. If a previous baby developed GBS infection.
4. If the woman has a fever during labour (temperature of greater than 38°C) and/or chorioamnionitis is suspected (in these situations, she should be offered broad-spectrum antibiotics that include GBS cover).

The RCOG recognises that the following risk factors also increase a baby's risk of developing EOGBS infection but does not specifically recommend offering intrapartum antibiotic prophylaxis to women with:

5. Labour starting or waters breaking before 37 completed weeks of pregnancy.
6. Where there is prolonged rupture of the membranes – more than 18 hours before delivery.

In addition to the above, the National Institute of Health and Care Excellence (NICE) published a guideline on antibiotics for neonatal infection (NICE 2012) which states that the offer of intrapartum antibiotic prophylaxis should also be considered for women in preterm labour:

- If there is pre-labour rupture of membranes of any duration
- If there is suspected or confirmed intrapartum rupture of membranes lasting more than 18 hours.

Different Trusts may also use different risk factors or combinations of risk factors.

Routine antenatal testing for GBS carriage is not currently recommended either by the RCOG or by the UK National Screening Committee (UK NSC).

Misconceptions

The following are perhaps the most common misconceptions surrounding GBS:

Misconception 1:
Since antenatal testing for GBS carriage is not currently recommended for all pregnant women by the UK NSC or the RCOG, it must be unnecessary and/or unavailable.

Tests for GBS carriage are available; there are in fact three different tests used in the UK.

Firstly, there is a conventional NHS test that uses a Standard Direct Plating technique. This is the test widely used to investigate genital samples (usually from high vaginal swabs) for common infections such as those causing discharge or irritation. Indeed, Public Health England's UK SMI B28 which describes this Standard Direct Plating method (PHE 2014a) points out that this standard test is not very sensitive at detecting GBS. It says that, instead:

'According to local protocol, patients judged at high risk for the development of group B streptococcal infection may be screened for carriage. Optimum yield will be achieved by selective/enrichment procedures applied to swabs obtained from the vagina and the anorectum' (PHE 2014a).

The second test is the Enriched Culture Medium (ECM) test which is specifically designed to detect GBS carriage and is recognised as the 'gold standard' for this purpose. Described by PHE's UK SMI B58 (2014b), the test involves taking samples from the lower vagina and rectum which are then cultured using selective media. ECM tests are available from a number of NHS Trusts and private laboratories as home testing packs for around £35.

Thirdly, there is the Polymerase Chain Reaction method, which is much faster than both the conventional NHS test and the ECM test, but is also more expensive and not widely available in the UK outside of research studies.

Misconception 2:
Tests detecting for GBS carriage are inaccurate.

The accuracy of the test result depends on the method used.

The conventional NHS test is not very sensitive for detecting GBS carriage — although a positive result is highly reliable, a negative result is not. Only 50% or so of women who are carrying GBS when the swabs are taken will be accurately identified as carriers using the conventional NHS test — the rest will be incorrectly told they are **not** carriers.

The ECM test is both highly specific and sensitive. Research from Yancey *et al* (1996) found that, when performed correctly within five weeks before delivery, a negative result is 96% predictive of not carrying GBS at delivery — so only 4% of women acquired carriage between the test and giving birth. It found that a positive result is 87% predictive of carrying GBS at delivery — so 13% of women lost carriage between performing the test and giving birth.

Misconception 3:
Screening pregnant women for GBS carriage would lead to too many women receiving antibiotics unnecessarily.

Daniels *et al* (2011) reported that 21% of women carried GBS in labour, with 22% of women having one or more recognised risk factors. This suggests that similar proportions of women would be offered intrapartum antibiotic prophylaxis using either strategy.

They found that only 29% of the women with one or more risk factors were actually carrying GBS: 71% were not. The presence of risk factors is poor at predicting which women are carrying GBS. Similarly, the absence of risk factors is poor at predicting the absence of GBS carriage — 20% of the women with no apparent risk factors were nevertheless carrying GBS. Using risk factors, almost three quarters of women offered antibiotics in labour to prevent EOGBS infection might not be carrying GBS.

Yancey *et al* (1996) showed that after a positive ECM test result, taken within five weeks of delivery, 87% of women were still carrying GBS in labour: only 13% were not. A negative ECM test result is even more predictive of not carrying GBS in labour — only 4% of the women with a negative ECM test result were carriers in labour.

Testing to see whether a woman is a GBS carrier late in her pregnancy could both help better guide the targeted and appropriate use of antibiotics for women most at risk of their babies developing EOGBS infection and reduce unnecessary use.

Misconception 4:
There is no point in testing since 'it is transient' OR 'once a carrier always a carrier'.

The definition of the word transient is 'lasting only for a short period of time; usually not recurring.' It is misleading when people use the word synonymously with the description 'comes and goes' — as in 'here today, gone tomorrow'.

GBS carriage can come and go from the vagina quite

naturally, but this happens over a period, not daily. The 35–37 weeks of pregnancy window is considered optimal for testing for GBS carriage. Tests taken then are very good at predicting whether or not the woman will be carrying when she is most likely to go into labour — during the following five weeks.

GBS detected before the current pregnancy is not a good predictor of whether the woman is carrying the bacteria in a subsequent pregnancy. However, 38–53% of women carrying GBS in one pregnancy are also positive in the next (Cheng *et al* 2008, Turrentine & Ramirez 2008, Page-Ramsey *et al* 2012).

UK practice

An increasing number of obstetricians, midwives, and even pregnant women are recognising that the RCOG's risk-based prevention guidelines have failed to reduce the number of EOGBS infections. Perhaps this is not surprising in the light of the Daniels *et al* (2011) study reporting that fewer than three out of every ten women who have a risk factor actually carry GBS, while one in every five without any risk factor carries it. Clinicians see this in practice and as a result are taking their own action.

In March 2015, the RCOG released their first report from their *Audit of current practice in preventing early-onset neonatal group B Streptococcal disease in the UK*. From this, we learn that most units are offering intrapartum antibiotic prophylaxis in accordance with the RCOG's approved list of risk factors, plus in other situations too. The audit highlights 13 additional scenarios in which women are offered antibiotics in labour to prevent EOGBS infection developing in their babies.

The audit reports that over half (55.9%) of the UK's NHS maternity units are testing some or all pregnant women for GBS carriage. In more than three quarters of these units, the testing is done at the mother's request. However, most of the units are not using the recommended (ECM) test for this purpose — 61.5% report they are using non-enriched standard media tests, and almost a third reported not knowing which method they used (RCOG 2015).

Health professionals recognise that knowing a pregnant woman's GBS carriage status is useful and are following through by testing. However, without easy access to the GBS-specific ECM test, their efforts to improve EOGBS prevention are inevitably being hampered.

Information about GBS

Most obstetricians and midwives would agree that providing parents-to-be with as much information as is pertinent for the safe arrival of a healthy baby is not only a good idea but vital. A survey of over 2000 young women in the early stages of pregnancy through to their youngest child being aged five or under (Bounty 2013) found that 97% wanted to be told about GBS and offered sensitive testing for it during pregnancy. Forty per cent of the survey respondents had not previously heard of GBS. And of those who knew about GBS, 40% wanted more information.

The RCOG (2015) audit reported that most units provided written patient information on GBS (94.4%), most frequently that provided by the UK charity Group B Strep Support (GBSS), which implies wide recognition of its accuracy and objectivity. However, although the GBSS literature includes an explanation of the case for universal GBS screening, most units only gave it to women either with a history of GBS or with an RCOG risk factor present. This means that many women remain in ignorance of this potentially vital opportunity.

Optimal care involves providing the most accurate information, so that women can make their own informed choices — and for GBS, that includes making informed decisions about whether or not to test, and any subsequent action. It is equally important that busy health professionals have all the information they need.

Time for change?

Since 2003, the UK NSC and the RCOG have recommended against routine antenatal screening for GBS carriage, endorsing a risk-based approach to determine who to offer antibiotics in labour. However, risk factors have been shown to be poor at predicting whether a woman is carrying GBS (the key risk factor for passing it on to her newborn baby). The rate of EOGBS infection in England, Wales and Northern Ireland has not fallen since the risk-based prevention strategy was first introduced — it was the same in 2013 (0.38 per 1000 live births) (PHE 2013) as it was in 2003 (0.37 per 1000 live births) (HPA 2004). During that time, the number of births per year has increased by 20%, and so unfortunately has the actual number of babies being infected.

Most developed countries with an EOGBS prevention strategy use an antenatal screening approach, with antibiotics offered in labour to those women where GBS was detected late in pregnancy. Research published by Schrag *et al* (2002) reported:

'the screening approach was more than 50% more effective than the risk-based approach at preventing perinatal group B streptococcal disease.'

Countries which offer routine screening have seen their rates of EOGBS infection fall by up to 86% (Andreu *et al* 2003, Daley *et al* 2004, Jordan *et al* 2008, Albouy-Llaty *et al* 2012) — fewer cases of septicaemia, pneumonia and meningitis.

Recently, the Netherlands — one of the small number of developed countries that also uses a risk-based GBS prevention strategy — reported that the introduction

of their prevention guidelines in 1999 had not reduced the incidence of disease in neonates, quite the reverse. They conclude:

'The guidelines should be reassessed and alternative approaches to prevent infant invasive group B streptococcus disease should be sought' (Bekker *et al* 2014).

Many UK maternity units have implemented their own strategies to reduce the number of EOGBS infections on their watch but for too many, the right test is not available to them.

The recent RCOG (2015) audit calls for stricter adherence to their guidelines, though fails to explain how this could improve EOGBS prevention. Would it not perhaps be more appropriate to call for the guidelines to catch up with the practices that are in already in play in most maternity units?

The UK NSC is due to review its policy on antenatal screening for GBS in 2015/16. The RCOG is also due to review its guidelines in approximately the same time frame. Surely it's now time for change.

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