Group B streptococcus infection: risk and prevention

Jane Plumb and Ginny Clayton

present midwives with information which could help prevent babies contracting GBS infection

SUMMARY Group B Streptococcus (group B Strep or GBS) is the UK's commonest cause of severe early-onset (up to six days) infection in babies. GBS is a normal body commensal, colonising the gut and vagina. GBS may pass to babies around childbirth; although most are unaffected, some develop severe infection. GBS is also a recognised cause of stillbirth and puerperal sepsis. Most GBS infection in babies is of early onset and most of these infections are highly preventable with the targeted use of intrapartum antibiotic prophylaxis. This article reviews current UK guidelines and prevention strategies.

Keywords Group B Streptococcus, infection, prevention, intrapartum antibiotic prophylaxis (IAP), early onset GBS neonatal sepsis (EOGBS), late onset GBS neonatal sepsis (LOGBS)

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Neonatal GBS infection

Seventy five per cent of neonatal GBS infections occur in the first six days of life, 25 per cent occurring later (seven-90 days) (Heath and Schuchat 2007).

One in 10 babies with GBS infection dies (Heath et al 2004), and some survivors suffer long-term disabilities: following GBS meningitis, 50 per cent suffer disabilities which are severe in 25 per cent of babies (Bedford et al 2001).

Early onset GBS neonatal sepsis (EOGBS)

This is from birth to six days and usually presents, within 24 hours of birth, as septicaemia or pneumonia, resulting from vertical transmission of a GBS colonised mother to her baby during or shortly before birth (Heath and Schuchat 2007). Recognised risk factors include:

Some survivors suffer long-term disabilities: following GBS meningitis, 50 per cent suffer disabilities which are severe in 25 per cent of babies

- previous sibling diagnosed with invasive GBS infection
- positive maternal antenatal GBS culture (vaginal, rectal or urine)
- maternal intrapartum fever
- prolonged rupture of membranes (>18 hours)
- pre-term labour and birth

(Heath et al 2009)

Late onset GBS neonatal sepsis (LOGBS)

Occurring from seven-90 days, it usually results in meningitis and/or septicaemia. LOGBS can be acquired from the mother or others (Jordan et al 2008). Risk factors include:

- pre-term birth
- a positive maternal antenatal GBS culture

Recognising GBS infection

Symptoms for EOGBS and LOGBS may be vague and include:

- grunting
- lethargy
- impaired consciousness
- irritability
- poor feeding; vomiting
- very high or low heart rate

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- hypotension
- hypoglycaemia
- abnormal (high or low) temperature
- abnormal (fast or slow) breathing rates with cyanosis

LOGBS may additionally present with signs of meningitis, such as convulsion, stiff neck or a high pitched cry.

Prevention

Intrapartum antibiotic prophylaxis (IAP) significantly reduces the incidence of EOGBS. Many developed countries offer IAP to pregnant women with known GBS carriage or risk factors for EOGBS. Most of these countries offer GBS screening to women in late pregnancy (Edmond et al 2012).

The National Institute of Health and Care Excellence (NICE) (2008), the UK National Screening Committee (NSC) (2012) and the Royal College of Obstetricians and Gynaecologists (RCOG) (2012) recommend that not all women be offered routine antenatal screening for GBS.

The 'gold standard' method for sample taking and culture (HPA 2012a) comprises swabs being taken from the low vagina and rectum, then cultured using an enriched culture medium (ECM). Such test results are very predictive of GBS carriage when taken within six weeks of birth (Yancey et al 1996). ECM testing is available privately and will soon be available on the NHS. However, at present, too often swabs are taken from the high vagina and cultured on standard agar plates, missing up to half of GBS carriers.

NICE (2012) and RCOG (2012) recommend that IAP should be offered to women who have

- had a previous baby with invasive GBS infection
- GBS colonisation, bacteriuria or infection during this pregnancy
- intrapartum fever

At present, too often swabs are taken from the high vagina and cultured on standard agar plates, missing up to half of GBS carriers

Prolonged rupture of membranes (defined as >18 hours by NICE, >24 hours by RCOG) and pre-term labour (<37 weeks' gestation) are recognised independent risk factors for EOGBS (Colbourn and Gilbert 2007).

There are no specific treatments to prevent LOGBS; like other bacterial infections, GBS may be transmitted through skin-to-skin contact, so rigorous hand-washing is critical before handling newborn babies.

GBS is carried in the bowel and vagina and is harmless for the carrier unless it gets into the 'wrong place', such as the urinary tract. Antibiotics cannot eradicate GBS carriage.

Effect of UK guidelines

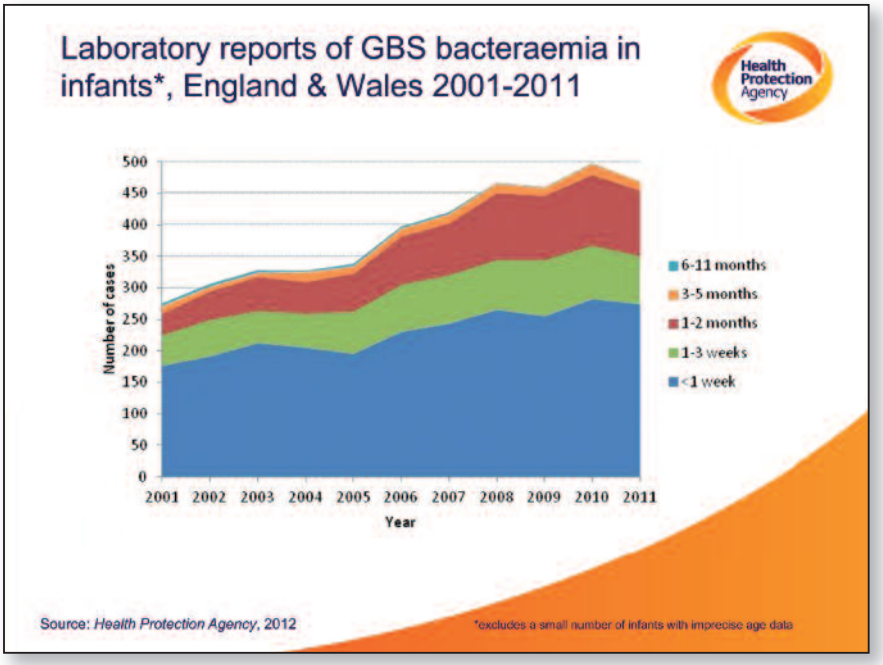
Reduced EOGBS incidence was anticipated following the introduction of the RCOG's 2003 risk-based prevention guideline, but that has not happened. In fact GBS infection in babies aged from birth to 90 days increased between 2003 and 2011 by 15 per cent to 0.63 cases per 1,000 live births. The incidence in babies aged from birth to six days showed no significant change at 0.38 cases per 1,000 live births (HPA 2004; 2012b).

An audit of 171 UK obstetric units' GBS protocols showed significant variation compared with RCOG guidelines (RCOG and London School of Hygiene and Tropical Medicine (LSHTM) 2007). An update including actual practice would establish the current situation better to inform policy.

Potential improvements to prevention

More EOGBS could be prevented by

Figure 1: **Laboratory reports to Health Protection Agency (Guy 2013)**



antenatal screening using vagino-rectal swabs and culturing on ECM than using risk factors (many women with risk factors don't carry GBS). The proportion of women offered antibiotics in labour would remain similar (Daniels et al 2011).

In a UK study (Vergnano et al 2010), 67 per cent of babies with EOGBS were born to mothers with one or more known GBS risk factors but only 21 per cent of women received correct IAP. Fifty-80 per cent of EOGBS would have been preventable had existing guidelines been followed, but the risk-based strategy may be too complex and difficult to understand, and therefore poorly implemented.

While inappropriate use of broad-spectrum antibiotics promotes antibiotic resistance, USA studies have not found increased antibiotic resistance from IAP using narrow-spectrum benzylpenicillin for GBS (Stoll et al 2005). Similarly, concerns about major allergic reactions to penicillin, potentially devastating to mother and baby, have been allayed (Law et al 2005).

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NICE clarified the situations in which IAP should be offered (NICE 2012) and what action to take for babies born in higher risk situations or with signs of infection. Improved education of health professionals is critical for these guidelines to be effective.

Conclusion

GBS is the commonest cause of serious infection in newborn babies. EOGBS is usually preventable. Yet pregnant women are neither told about GBS nor about testing. So how can they, with their health professionals, make an informed choice?

We believe that:

- women should be informed about GBS as part of routine antenatal care;
- women should be offered a 'gold standard' ECM GBS test at 35-37 weeks' gestation;
- women with GBS colonisation, bacteriuria or infection during the current pregnancy, or with other risk factors for EOGBS, should be offered IAP.

Midwives can help

Midwives are uniquely well placed to help EOGBS prevention by:

- informing pregnant women about GBS and its prevention;
- ensuring that mothers of babies at raised risk of EOGBS are offered IAP as soon as labour has started;
- informing parents what signs of GBS infection to look for in their baby postnatally, and when to seek an urgent medical review. TPM

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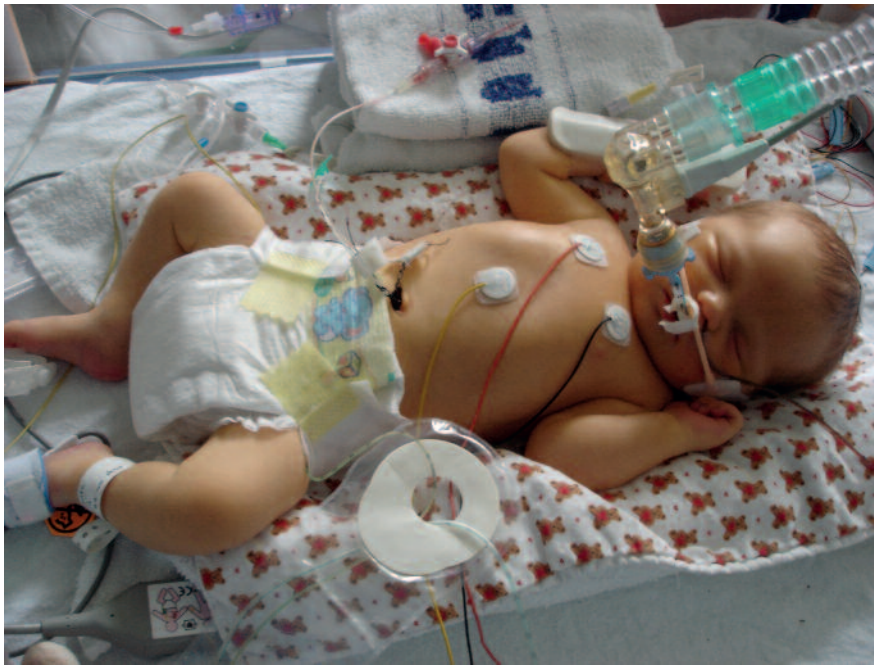

Adam Cheshire, pictured on day two, was born after a normal pregnancy with no recognised risk factors for GBS infection. Adam had GBS meningitis and has been left with hearing, sight and developmental disabilities

Useful resources

- http://www.gbss.org.uk/
- http://www.nhs.uk/chq/pages/2037.aspx?categoryid=54
- http://tinyurl.com/kh497dq
- http://tinyurl.com/n8tf9dv

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