AIMS For a better birth...

The war on group B strep

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Midwife Sara Wickham provides the background and explores the options open to women diagnosed with bacterial diseases that pose potential risks for their babies.

Group B streptococci (GBS) are bacteria that live inside (or colonise) the gastrointestinal tract, bladder and/ or throat of many people, including pregnant and labouring women. The estimated prevalence of colonisation is 5-80 per cent of the population (which shows, if nothing else, the varying usefulness of such numbers).

GBS is generally benign in adults, only posing a danger to those with compromised immunity, and also in most babies who pick up these bacteria during birth. But it can occasionally cause serious harm to others. Because of this, pregnant women may be offered screening and intervention-yet another pond of uncertainty to swim in, beset as it is with complex numbers, difficult decisions and tiny chances of developing very serious conditions.

For several years, most areas in the UK have taken a 'riskbased' approach to GBS screening, where practitioners attempt to identify the babies who are at increased risk of becoming infected with GBS. Risk factors (which vary between hospitals) include premature labour (before 37 weeks of pregnancy), a woman with a high temperature during labour or a woman whose waters have been broken for 18-24 hours[1].

Where such a risk factor is identified, the woman will be offered intravenous antibiotics during labour. In these situations, swabs may be taken to see if the woman has GBS (or other bacteria), but it takes a while to perform the testing, so the results are usually only available after the birth.

As a consequence, the woman has to make a decision based on the possibility that, if she does have GBS, her baby might be more at risk of becoming infected, rather than knowing (from screening tests) that she definitely has GBS.

By contrast, pregnant women in the US are offered routine screening for GBS at the end of pregnancy[2], and are offered intravenous antibiotics in labour if they are found to have GBS in their vagina or rectum. Some UK practitioners have mooted the idea of replacing the current risk-based approach with the approach used in America, termed 'culture-based screening'[3]. With culture-based screening, women who have risk factors, but not GBS, may escape being given unnecessary antibiotics (although some

practitioners may recommend them anyway, in case other pathogens are present). However, hospitals will offer antibiotics to all of the 10-30 per cent of women who have a vagina and/or rectum colonised with GBS[4], even though only a tiny proportion of these babies will be affected with GBS disease[5,6].

GBS disease comes in two forms: early onset and late onset.

Early-onset GBS disease occurs within the first week of life; three-quarters of the babies who develop GBS disease will do so at this time. Problems usually become apparent within a few hours of birth, and can include generalised infection (sepsis), pneumonia or meningitis.

GBS disease is termed 'late onset' when it occurs between a week and a few months of age. Not all cases of late-onset GBS are due to the baby's mother transmitting GBS during birth; some will occur from other (but usually unknown) sources. The impact of late-onset disease is usually less severe.

Babies found to have GBS disease are treated with antibiotics and given whatever other support they need in hospital special care units.

There are large discrepancies among the findings of different research studies as far as the outcomes of babies who contract GBS are concerned. It is probably fair to say that, currently, researchers are more concerned with how to prevent GBS disease than what the prognosis is for the infants who do contract the disease. In 2002, researchers[7] published an analysis of two years' worth of data from births in the North of England looking at a number of aspects of GBS. They found that:

- The prevalence of early-onset GBS sepsis was 0.57 per 1000 live births. Put another way, one in every 1754 women had a baby with GBS disease.
- Premature babies accounted for 38 per cent of all cases of GBS disease, and 83 per cent of all deaths from GBS disease during the time of the study.
- Of the 39 (out of 62,786) babies who developed GBS disease, three were stillborn and six died soon after birth. Five of the six babies who died were born prematurely (before 36 weeks of pregnancy).
- Four of the mothers of the babies who contracted GBS disease had been given antibiotics in labour.

We can then say that, in this study, around one in four babies who were known to have GBS died as a result. In reality, the mortality (death) rate from GBS may be lower than this, as some babies may have had GBS disease and recovered without it having been diagnosed. Indeed, the US Centers for Disease Control quote a mortality rate during the 1990s of 4 per cent[3]. It is difficult to know which of these figures is the more accurate; the real figure may be somewhere between the two and, as with many things, will be partly dependent on local expertise and available technology.

Another interesting finding of the GBS study in the North of England was that, had they used riskbased screening, they would have identified 78 per cent of the babies who developed GBS disease. (But that means they would still have missed 22 per cent, which is one reason that some people are calling for

culture-based screening). However, it was calculated that the administration of antibiotics according to the results of risk-based screening would have meant that 16 per cent of all women in labour were taking antibiotics - 16 per cent of 62,786 equates to 10,046 women - in an attempt to prevent the deaths of nine babies. (And let's not forget that four of the mothers of the babies who had GBS disease had taken antibiotics).

In other words, 1116 of the women who have risk factors in this study would have needed to take antibiotics in labour to prevent one baby dying from GBS - but nevertheless without a solid guarantee that this hypothetical baby would be saved.

As already mentioned, culture-based screening would identify the 10-30 per cent of pregnant women whose vagina and/or rectum was colonised with GBS[4]. The screening test involves taking swabs from the inner walls of a woman's vagina and rectum - not a particularly pleasant procedure, but not as invasive as some. Yet, only one or two in every thousand of the women who have a positive result if we screen this way will have a baby who ends up with GBS disease[5,6]. Even when we take the most conservative estimate (assuming two women in a thousand with GBS have a baby with GBS disease, and using a mortality rate of 25 per cent), this would mean that 2000 women who tested positive for GBS would need antibiotics in labour to prevent the death of one infant.

There are a number of other factors that women may want to take into account here. According to the CDC[3], your baby is at highest risk of contracting GBS disease if you test positive and also have any of the following conditions:

- previous baby with GBS disease
- urinary tract infection due to GBS
- fever during labour
- rupture of membranes 18 hours or more before delivery
- labour or rupture of membranes before 37 weeks.

It may be that, while policymakers are debating which of the two approaches to use, women might be better served by research looking at the outcomes where the two are combined. Even this means that many more women would have antibiotics than needed them, but at least this would be slightly more specific for the women who might be at risk and who would prefer to take antibiotics.

Perhaps we could also see whether there are other factors that could help us be even more specific about who is at risk. While this might not be deemed cost- effective on a population basis, it may be more helpful for the women who wish to avoid unnecessary intervention.

There are, inevitably, a number of reasons why women may not want antibiotics in labour unless they are truly necessary. Apart from the possible side-effects, and the discomfort of having movement hindered by an intravenous cannula in labour, there are more serious ramifications of policies advocating mass antibiotic cover. While penicillin[8] and ampicillin[9] are currently effective for treating GBS disease in babies, ever since antibiotics have been used to treat large numbers of women whose babies were

deemed at risk of GBS disease (whether on a risk-based or culture-based policy), the rate of Escherichia coli infections in premature babies has more than doubled. Around 85 per cent of the E. coli infections in one study were resistant to the drugs prescribed to treat GBS[10].

There is a huge debate over antibiotic-resistant bacteria in general, and these policies involve giving antibiotics to a lot of women, which may have ramifications for the population as a whole. It has also been suggested that giving antibiotics while babies are still in their mother's uterus might delay the baby's gut being colonised with normal, "good" bacteria while allowing dangerous penicillin-resistant bacteria to become established there instead[11].

There is also a need to find out whether giving antibiotics actually makes a significant difference to the outcome. The assumption that this is the case has long been just that: an assumption. Cochrane reviewers[12] who looked at the trials comparing women who had been given antibiotics with women who had not received antibiotics found that, although antibiotics reduced the incidence of GBS infection in babies, there was no significant difference in the numbers of babies who died. They found the few trials that had looked at this area to be of poor quality, and called for further research - something which surely needs to be done before even more women receive unnecessary drugs in labour.

Having said that, there is plenty of research to support the fact that midwifery and medical interventions in labour, such as vaginal examination, can increase rates of infection[13, 14, 15, 16, 17] yet there is no evidence to suggest that hospitals are making attempts to limit these interventions. Added to the suggestion from an American review of laboratory procedures[18] that these may not always be effective at detecting GBS in cultures, the decision can become fraught for some women.

Women looking for information about GBS on the Internet are likely to come across some of the most emotive websites in existence. Some are named for babies who died from GBS disease or who continue to suffer from the effects. While I have enormous sympathy for these families, this is only one side of the picture. The other, I hope, can be seen by looking at some of the numbers in this article. The promotion of GBS screening is likely to increase over the next few years, yet the available data show that there is no simple answer to this issue - and no way of screening for GBS in babies that doesn't lead to thousands of women having antibiotics they most likely don't need.

It is appealing to want to reduce the rate of GBS infection; it is the most common cause of infectious disease in babies, and it can be fatal. Yet, as with the cases of rhesus disease and haemorrhagic disease, we are often using sledgehammers to crack nuts, potentially at the expense of our future health. Antibiotics have been a marvellous and lifesaving discovery. When used appropriately, they are truly useful to humanity.

Nevertheless, we are already suffering some of the consequences of our overuse of antibiotics, which is surely something we need to temper. GBS is increasingly seen as a publichealth issue. However, any position taken on GBS (as well as many other birth interventions) really depends on two things: it depends on whether you are happy to be gathered together with all of the other Ms General Publics and

told what is best for your health (and that of your children); or whether you want to make the choices that suit you as an individual. And, perhaps even more important, it depends on how you define health, on whether you are happy to accept the potential costs of medical technology, and how comfortable you are with the very unfashionable idea that nothing in life is certain.

References

1. Boyer KM, Gotoff SP. Strategies for chemoprophylaxis of GBS earlyonset infections. Antibiotic Chemother, 1985; 35: 267-80
2. Schrag SJ et al. A population-based comparison of strategies to prevent early-onset group B streptococcal disease in neo-nates. N Engl J Med, 2002; 347 (4): 233-9
3. Schrag S et al. Prevention of Perinatal Group B Streptococcal Disease. Revised Guidelines From CDC. 16 August 2002/51 (RR11): 1-22
4. Regan JA et al. Vaginal infections and prematurity study group. The epidemiology of group B streptococcal colonization in pregnancy. Obstet Gynecol, 1991; 77: 604-10
5. Gilbert GL, Garland SM. Perinatal group B streptococcal infections. Med J Aust, 1983; 1: 566-71
6. Isaacs D, Royle JA. Intrapartum antibiotics and early-onset neonatal sepsis caused by group B streptococcus and by other organisms in Australia. Pediatr Infect Dis J, 1999; 18: 524-8
7. Oddie S, Embleton ND. Risk factors for early-onset neonatal group B streptococcal sepsis: case-control study. BMJ, 2002; 325: 308
8. Garland SM, Fliegner JR. Group B streptococcus (GBS) and neonatal infections: the case for intrapartum chemoprophylaxis. Aust NZ J Obstet Gynaecol, 1991; 31: 119-22
9. Boyer KM, Gotoff SP, Prevention of early-onset neonatal group B streptococcal disease with selective intrapartum chemoprophylaxis. N Engl J Med, 1986; 314: 1665-9
10. Stoll BJ et al. Changes in pathogens causing early-onset sepsis in very-low-birthweight infants. N Engl J Med, 2002; 347: 240-
11. Gilbert GL. Preventing perinatal group B streptococcal infection: the jury is still out (editorial). Med J Aust, 2002; 178: 199-200
12. Smaill F. Intrapartum antibiotics for group B streptococcal colonisation (Cochrane review). The Cochrane Library, Issue 4, 2003
13. Yancey MK et al. Peripartum infection associated with vaginal group B streptococcal colonization. Obstet Gynecol, 1994; 84: 816-9
14. Schuchat A et al. Risk factors and opportunities for prevention of early-onset neonatal sepsis: a multicenter case-control study. Pediatrics, 2000; 105: 21-6
15. Gibbs RS et al. Internal fetal monitoring and maternal infection following cesarean section: a prospective study. Obstet Gynecol, 1978; 52: 193-7
16. Soper DE et al. Characterization and control of intraamniotic infection in an urban teaching hospital. Am J Obstet Gynecol, 1996; 175: 304-10
17. Seaward P et al. International multicentre term prelabor rupture of membranes study: evaluation of predictors of clinical chorioamnionitis and postpartum fever in patients with prelabor rupture of membranes at term. Am J Obstet Gynecol, 1997; 177: 1024-9

18. CD laboratory practices for prenatal group B streptococcal screening and reporting-Connecticut, Georgia and Minnesota 1997-1998. MMWR, 1999; 48: 426-8

Note: Many of the documents on GBS can be freely accessed online. Links can be found at: www.groupbstrep.com/Links