

Description

The Management of Group B Streptococcal Infection: A Balanced Discussion

Kate Braye – Midwife and Midwifery Lecturer

@groupBStrepSupport

Jane Plumb – Chief Executive of Group B Strep Support

@JanePlumb

Introduction

The management of maternal Group B Streptococcal (GBS) infection has been vigourously debated for a number of years. In this blog midwife Kate Braye RN, RM, PhD and Jane Plumb, Chief Executive of Group B Strep Support, present and discuss their positions in the ongoing debate.

Biography



Kate Braye RN, RM, PhD is an English midwife who moved to Australia in 1985 and now resides in Newcastle, New South Wales. She has been a midwife for 37 years and works clinically at the local tertiary hospital birthing unit, is a member of the district ethics committee and lectures at University of Technology Sydney. Her PhD is titled:

"A study of the management of group B streptococcal colonisation in pregnant women: Benefits and risks of preventative modalities". Her latest paper, "*Intrapartum antibiotic prophylaxis for women who are screened positive for group B streptococcal colonisation: Clinical compliance with the guideline"*, showed less than one third of women reviewed received the recommended regimen of IAP for GBS risk after universal screening.

The "management of GBS" – Debate and Contention

In 2021, amidst all other health crises, debate continues around the best way to manage the risk of early-onset group B streptococcus infection (EOGBSI) in term babies. Maternal GBS colonisation in pregnant women is common and nearly always benign. EOGBSI in term babies is rare, estimated at 1 in 5000 livebirths in the UK.[1] It would be comforting to

believe that if we could identify and treat every instance of maternal GBS, we could eradicate every instance of EOGBSI. Unfortunately, preventing GBS infection is not that straightforward. We know EOGBSI has been diagnosed in babies whose mothers returned a negative screen.[2,3] Conversely, some GBS positive mothers that are provided with inadequate or no intrapartum prophylactic antibiotics (IAP) during labour, do not have babies who succumb to EOGBSI.[3,4] The reality is, regardless of screening method or IAP regime, we cannot prevent all cases of EOGBSI.[5]

This notwithstanding, many high-resource countries have followed the lead of the United States and recommend that clinicians offer universal screening, rather than the alternative risk-based approach to detect maternal GBS colonisation and then provide IAP to all women who return a positive result. Women are routinely informed that the screen will identify the presence of GBS colonisation, and that colonisation is an important risk factor for EOGBSI. However, they are less likely to be informed that they may decline the screen or, even more controversially, decline IAP in the circumstances of a positive result.

Despite significant pressure from politicians and GBS support charities, the UK National Screening Committee (UKNSC) has resisted a shift from the risk-based approach to universal screening as they consider research has been unable to demonstrate that the benefit of providing all women positive for GBS with IAP outweighs potential harms of this intervention.[5]

A large and growing body of evidence demonstrates that antibiotics, once thought harmless, are not without risk.[6-8] Antibiotics have been associated with many adverse health impacts. They have been associated with reduced diversity of the maternal microbiome and a resulting reduction in the diversity of the baby's seeding microbiome (an important factor in the baby's developing immune system).[9-14]

Approaches to GBS mitigation must recognise the growing association between antibiotics and on-going immune related health issues in children. Furthermore, important considerations include the unnecessary medicalisation of birth, antimicrobial stewardship, and the risk of anaphylaxis. To date, all these risks have not been adequately weighed in the debate regarding GBS screening and IAP.

While association is not causation, we must present these potential harms to women when we discuss GBS management with them. A woman may decide she would prefer not to have prophylactic antibiotics as she perceives the chance of infection is, for her, vanishingly low and that the risks of IAP outweigh the benefits. Women, in high-resource settings, are expertly monitored in labour by midwives trained to detect deviation from normal. This includes signs of infection in a woman and/or her baby. Some women may prefer this "wait and see" approach to GBS management, considering the effective treatment that can be provided if clinically indicated. Alternatively, a woman may decide to accept prophylactic antibiotics as, to her, the risk of EOGBSI is one she is not prepared to embrace.

Women (and clinicians) have a right to be provided with all information regarding any birth intervention, including GBS management.

Conclusion

I will continue to advocate for a more nuanced, individualised approach to GBS management, where women are provided with clear and relevant information to enable an informed decision about screening and prophylaxis for GBS and offered timely antibiotics when appropriate to signs and symptoms.

References

1. Royal College of Obstetricians and Gynaecologists. Prevention of early-onset neonatal group B streptococcal disease. Green-top guideline No. 36. (2017).
2. Berardi, A.*, et al.* An area-based study on intrapartum antibiotic prophylaxis for preventing group B streptococcus early-onset disease: advances and limitations. *Journal of Maternal and Fetal Neonatal Medicine* 30, 1739-1744 (2017).
3. Braye, K.*, et al.* Group B streptococcal screening, intrapartum antibiotic prophylaxis, and neonatal early-onset infection rates in an Australian local health district: 2006-2016. *PLoS One* 14(2019).
4. Braye, K., Ferguson, J., Ball, J. & Foureur, M. Intrapartum antibiotic prophylaxis for women who are screened positive for group B streptococcal colonisation: Clinical compliance with the guideline. *The Australian & New Zealand journal of obstetrics & gynaecology* (2021).

5. Seedat, F.*, et al.* UK National Screening committee (UK NSC). Universal antenatal culture-based screening for maternal GBS carriage to prevent EOGBS disease. Review update. (2016).
6. Blaser, M. Antibiotic overuse: Stop the killing of beneficial bacteria. *Nature* 476, 393-394 (2011).
7. The Australian Commission on Quality and Safety in Health Care. Antimicrobial use and resistance in Australia (AURA). (2017).
8. Sola, A. Abuse of Antibiotics in Perinatology: Negative Impact for Health and the Economy. *Neoreviews* 21, e559-e570 (2020).
9. Collado, M.C., Rautava, S., Aakko, J., Isolauri, E. & Salminen, S. Human gut colonisation may be initiated in utero by distinct microbial communities in the placenta and amniotic fluid. *Scientific Reports* 6(2016).
10. Rautava, S., Luoto, R., Salminen, S. & Isolauri, E. Microbial contact during pregnancy, intestinal colonization and human disease. *Nat Rev Gastroenterol Hepatol* 9, 565-576 (2012).
11. Azad, M.B.*, et al.* Impact of maternal intrapartum antibiotics, method of birth and breastfeeding on gut microbiota during the first year of life: a prospective cohort study. *British journal of Obstetrics and Gynaecology* 123, 983-993 (2015).
12. Blaser, M.J. & Dominguez-Bello, M.G. The Human Microbiome before Birth. *Cell Host Microbe* 20, 558-560 (2016).
13. Butel, M.J., Waligora-Dupriet, A.J. & Wydau-Dematteis, S. The developing gut microbiota and its consequences for health. *Journal of Developmental Origins of Health and Disease* 9, 590-597 (2018).
14. Dominguez-Bello, M.G., Godoy-Vitorino, F., Knight, R. & Blaser, M.J. Role of the microbiome in human



Jane Plumb is Chief Executive of charity Group B Strep Support, which works to stop group B Strep infections in babies. She has a passion for getting into the detail of the data about group B Strep, and is supported in this by an expert multi-disciplinary Medical Advisory Panel, which ensures the information the charity provides is accurate and up to date.

Jane is a member of the World Health Organization's Extended Technical Taskforce on Defeating Meningitis By 2030, Vice Chair of the Royal College of Obstetricians & Gynaecologists' Women's Network, a Trustee of the Meningitis Research Foundation, Chair of the Confederation of Meningitis Organisations and sits on the International Symposium on Streptococcus Agalactiae Disease 2021 Conference Local and Scientific Organising Committees, leading the Patient Voice Stream.

Jane has been a member of several National Institute of Health & Care Excellence guideline development committees and was a member of the Department of Health's priority setting workshops for group B Strep research in 2015/6, which led to several trials being commissioned, including the GBS3 Trial.

Preventing group B Strep infection in babies – where are we now?

Outline of the debate/contention around the management of GBS

There is universal agreement that the best way to reduce the risk of early-onset group B Strep (EOGBS) infections (those in the first 6 days of life) is to offer pregnant women intravenous antibiotics in labour. When started at least four hours before birth, this reduces the risk of EOGBS infection by 91% among term and 86% among preterm babies.[1] It is highly effective preventative medicine.

In the UK, there is debate over which of the following two strategies should be used to select to whom the IV antibiotics in labour should be offered:

A risk-based screening strategy – IV antibiotics are offered to women in labour when risk factors are present, including preterm labour, GBS detected from any maternal sample in this or a previous pregnancy, a previous baby had GBS infection, or maternal fever in labour.

A test-based screening strategy – all pregnant women are offered a GBS-specific test of vaginal and rectal swab samples late in pregnancy (typically 35-37 weeks' gestation). Intravenous antibiotics are offered in labour where:

- the test result is positive; or
- key risk factors are present (preterm labour, GBS bacteriuria this pregnancy, previous baby with GBS infection); or
- no test result is available and clinical risk factors are present (maternal fever or prolonged rupture of membranes).

The debate in the UK is unusual since globally, the issue is mostly regarded as settled. Most high-income countries use a test-based screening strategy, while low-income countries unable to provide the infrastructure for routine testing use the risk-based screening strategy, or have no prevention strategy at all. Countries using the test-based screening approach have seen their rates of GBS infection fall substantially.[2] In the US, for example, EOGBS infection fell from 1.7 per 1000 live births in the 1990s to 0.25 per 1000 live births in 2015.[3]

The UK uses a risk-based screening strategy which is demonstrably not working. Since it was introduced in 2003[4] both the UK's rate and number of EOGBS infections have increased; a rise of 37% in the total number of babies infected between 2000-1 and 2014-15 and a 19% rise in the rate per 1,000 live births.[5] The UK's EOGBS infection rate is now more than twice the US rate and higher than the estimated worldwide rate of 0.41 per 1,000 live births.[6]

Other countries using risk-based screening have also seen poor results compared to test-based screening. In the Netherlands a risk-based approach was introduced in 1999 and GBS infection in babies increased from 0.11 per 1,000 live births in 1987[7] to 0.57 per 1,000 live births in 2017.[8]

One of the reasons there is debate over which approach to use in the UK is a lack of large-scale randomised controlled trials (RCTs) demonstrating the benefit of a test-based screening strategy over a risk-based screening strategy. RCTs reported so far show a significant reduction in infection but were too small to show a significant reduction in mortality.

The charity successfully lobbied the UK Government to plug this research gap, securing £2.8m funding through the National Institute for Health Research (NIHR) for the GBS3 Trial, currently underway. This trial is comparing the effectiveness of the UK's current risk-based approach with two test-based approaches – bacteriological testing at 35-37 weeks of pregnancy or polymerase chain reaction (PCR) testing at the start of labour. The trial will involve 80 hospitals in England, Wales and Scotland and 320,000 women and their babies.[9] The results, expected in 2024, will inform future GBS prevention policy in the UK and beyond.

Group B Strep Support's position about how GBS should be managed

The charity's view, after reviewing all available evidence, is that the UK should adopt a test-based screening strategy. A recent systematic review and meta-analysis included 17 observational studies covering 11 million live births and 3798 cases of EOGBS infection.[10] It reported that testing-based prevention strategies were associated with lower incidences of EOGBS infection compared with risk-based strategies, with no significant benefit of risk-based strategies compared with no policy. It also found that test-based screening was not associated with significantly higher antibiotic administration rates (31% versus 29%).

The main problem with the UK's current approach is that risk factors are poor predictors of GBS carriage. A UK study reported 22% of women had risk factors, and 21 % carried GBS,[11] but importantly these were not the same women.

Only 29% of the women with risk factors also carried GBS: the overlap was only 6% which means that a risk-based screening strategy misses most of the women carrying GBS. Furthermore, risk factors have been shown to be poor predictors of whether a baby will develop EOGBS infection – 65% of babies who developed EOGBS infection were not flagged as at risk according to RCOG guidelines.[5]

Test-based screening strategies mean a similar proportion of women are offered the IV antibiotics in labour.[12] However, the antibiotics are offered to women whose babies are at highest risk of EOGBS infection – women who are most likely to be carrying GBS when they give birth. One of the key arguments against test-based screening has been that you risk 'overtreating' women with antibiotics when they don't need them. But using a risk-based screening strategy means giving antibiotics to a similar proportion of women, few of whom carry GBS. Testing allows us to narrow the focus to women whose babies are genuinely at higher risk, helping us to protect more babies and steward our antibiotic usage.

It is important that we listen to what pregnant women want. Surveys over the last several years have consistently shown that over 95% of pregnant women in the UK want to be told about group B Strep and to be offered GBS testing by the NHS.[13]

What we all ultimately want is a safe and effective maternal vaccine against GBS infection. But vaccine development has progressed slowly, in fits and starts, since the 1970s. Vaccines suitable for licensed use are likely at least 10 years away. Effective vaccines will be a significant improvement on any antibiotic-based prevention strategy, preventing most EOGBS infection, plus GBS related maternal infections, stillbirths and late onset GBS infections (in days 7-90 of life) which cannot currently be prevented.

A maternal vaccine with 80% efficacy and 90% coverage could prevent 107,000 stillbirths and infant deaths worldwide.[2]

Conclusion

Too many babies are suffering from preventable EOGBS infections. Risk-based screening is not working. Test-based screening has been shown to be better because it:

- prevents more EOGBS infections
- targets a similar level of antibiotic use to where it can protect most babies – to the women who are most likely to be carrying GBS when they give birth
- is what women say they want

A key barrier to test-based screening being introduced in the UK has been the lack of large-scale RCT data. We look forward to the GBS3 trial giving us the highest-quality data when it reports in 2024 and settling this issue for the UK and beyond.

References

1. Fairlie T, Zell ER, Schrag S. Effectiveness of Intrapartum Antibiotic Prophylaxis for Prevention of Early-Onset Group B Streptococcal Disease. *Obstet Gynecol*. 2013;121(3):570-577. doi:10.1097/AOG.0b013e318280d4f6
2. Le Doare K, O'Driscoll M, Turner K, et al. Intrapartum Antibiotic Chemoprophylaxis Policies for the Prevention of Group B Streptococcal Disease Worldwide: Systematic Review. *Clin Infect Dis*. 2017;65(February):S143-S151. doi:10.1093/cid/cix654
3. Centers for Disease Control and Prevention (CDC). *Active Bacterial Core Surveillance (ABCs) 2018 GBS Report | CDC*.; 2018. https://www.cdc.gov/abcs/reports-findings/survreports/gbs18.html. Accessed July 16, 2021.
4. Hughes RG, Brocklehurst P, Heath PT, Stenson B. Prevention of Early Onset Neonatal Group B Streptococcal Disease Summary. *RCOG*. 2003;(36):1.
5. O'Sullivan C, Lamagni T, Patel D, et al. Group B streptococcal (GBS) disease in UK and Irish infants younger than 90 days, 2014-2015: results from prospective surveillance. *Lancet Infect Dis*. 2018;In press:197-199.
6. Madrid L, Seale AC, Kohli-Lynch M, et al. Infant Group B Streptococcal Disease Incidence and Serotypes Worldwide: Systematic Review and Meta-analyses. *Clin Infect Dis*. 2017;65(February):S160-S172. doi:10.1093/cid/cix656
7. Bekker V, Bijlsma M, van de Beek D, Kuijpers T, van der Ende A. Incidence of invasive group B streptococcal disease and pathogen genotype distribution in newborn babies in the Netherlands over 25 years: A nationwide surveillance study. *Lancet Infect Dis*. 2014;14(11):1083-1089. https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(14)70919-3/fulltext.

8. de Gier B, van Kassel MN, Sanders EAM, et al. Disease burden of neonatal invasive Group B Streptococcus infection in the Netherlands. *PLoS One*. 2019;14(5):1-12. doi:10.1371/journal.pone.0216749
9. NIHR. New screening trial aims to improve detection and treatment for Group B Strep in pregnant women. https://www.nihr.ac.uk/news/new-screening-trial-aims-to-improve-detection-and-treatment-for-group-b-strep-in-pregnant-women/20283. Published 2019. Accessed November 29, 2019.
10. Hasperhoven GF, Al-Nasiry S, Bekker V, et al. Universal screening versus risk-based protocols for antibiotic prophylaxis during childbirth to prevent early-onset GBS disease. A systematic review and meta-analysis. *BJOG An Int J Obstet Gynaecol*. 2020;127(6):680-691. doi:10.1111/1471-0528.16085
11. Daniels J, Gray J, Pattison H, Gray R, Hills R, Khan K. Intrapartum tests for group B streptococcus: Accuracy and acceptability of screening. *BJOG An Int J Obstet Gynaecol*. 2011;118(2):257-265. doi:10.1111/j.1471-0528.2010.02725.x
12. Hasperhoven GGF, Al?Nasiry S, Bekker V, et al. Universal screening versus risk?based protocols for antibiotic prophylaxis during childbirth to prevent early?onset Group B streptococcal disease: a systematic review and meta?analysis. *BJOG*. January 2020:1-12. doi:10.1111/1471-0528.16085
13. Bounty. *Group B Strep Survey Results 2019*.; 2019.

Category

1. All4Maternity Blog
2. News & Views

Tags

1. Group B Streptococcus

Date Created
31st August 2021