Prevention of neonatal early onset GBS sepsis: A clear protocol is better than none—or several

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ABSTRACT
Revised New Zealand consensus guidelines on the prevention of early-onset group B streptococcus sepsis in the newborn are presented in this issue of the Journal. We provide some context for these recommendations and discuss issues considered by the multidisciplinary group in formulating the guidelines.

Presented in this issue of the Journal is the national consensus guideline on prevention of early-onset group B streptococcus (EOGBS) sepsis in newborns. Readers from other developed countries may wonder why New Zealand has chosen a risk-based approach to this preventable disease, over universal screening of pregnant women near term with antibiotic prophylaxis during labour for those who screen positive. Let's review the fundamental principles of a screening test, and then explain the rationale for this decision, which some might find controversial.

Principles of a screening test
In most high-income countries, GBS is the leading cause of sepsis in neonates within the first 48–72 hours of life and is accompanied by significant morbidity and mortality. Concerns about EOGBS sepsis take up many clinical hours. Because the disease can progress very rapidly, most newborn infants who present with respiratory distress will have initial investigations and be treated with intravenous antibiotics until GBS disease can be discounted (usually by 36–48 hours). Thus, the burden of disease warrants a screening programme.

It was demonstrated in the 1980s that the risk of vertical transmission could be reduced by giving mothers intravenous intrapartum antibiotic prophylaxis (IAP). Although 50–75% of infants born to mothers who carry GBS are merely colonised with the organism, about 1% will develop sepsis. Randomised controlled trials have shown that IAP does significantly reduce the incidence of newborn colonisation and most probably EOGBS sepsis, though there is no evidence for a reduction of neonatal mortality. Thus, there is an intervention that is beneficial.

Maternal gastrointestinal and/or genital tract carriage of GBS is a prerequisite for neonatal infection and occurs in around 20–30% of mothers in the third trimester. A New Zealand study in 1998/99 found that 22% of pregnant women were carriers of GBS. Screening for GBS is best done by collecting a lower vaginal and rectal swab at 35–37 weeks gestation, as swabs collected earlier do not predict carriage at term. The presence of GBS in the urine of pregnant women anytime in pregnancy is also predictive of colonisation at birth.

Lead maternity carers (LMCs) are in a unique position to counsel pregnant women about neonatal EOGBS sepsis and offer screening. Thus, screening for GBS within the New Zealand maternity system would reach those who would benefit most from it. The challenge for clinicians, though, is how best to identify mothers who should be offered IAP to prevent neonatal EOGBS...
sepsis in the most efficacious and cost-effective way, whilst minimising potentially unnecessary exposure to antibiotics.

**Two approaches to screening**

The approach advocated in the current national consensus guideline is risk-based—where LMCs assess women during pregnancy and during labour for any risk factors for neonatal EOGBS sepsis and offer IAP only to women with a risk factor. This approach is also taken in the UK citing a lack of evidence-based data to support universal screening. Analysis of UK epidemiological data also demonstrated that adopting universal screening would result in more women being treated to prevent one case and at a higher cost. Importantly, the UK National Institute for Health and Care Excellence (NICE) guidelines processes ensure that stakeholder and consumer views are adequately considered and responded to.

The alternative approach, as occurs in North America, is a recommendation for universal screening of all pregnant women at 35–37 weeks’ gestation and to offer IAP only to women who screen positive. The Centers for Disease Control made their recommendations following a retrospective cohort study in eight states which found a screening policy to be associated with a more than 50% lower risk of EOGBS sepsis compared with a risk-based policy. These two strategies have not been directly compared in a randomised controlled trial.

Both strategies agree that IAP should be offered if one of three risk factors is present—preterm labour, GBS bacteriuria, or a previous infant with GBS sepsis.

**Rationale for a risk-based approach**

One reason for the New Zealand decision is that the incidence of neonatal EOGBS sepsis is low. A two-year survey of EOGBS carried out by the New Zealand Paediatric Surveillance Unit in 2009–11 reported a national incidence of 0.26 (95% CI 0.18–0.37) per 1,000 live births, equating to around 15 cases per annum. This incidence is half that (0.5 per 1,000 births) reported in a similar 1998/99 national survey, and compares well with the incidence reported from elsewhere ranging from 0.26–0.38 per 1,000 births.

The multidisciplinary group considered other factors. Firstly, neither strategy will prevent all cases, for example, where there is a late presentation or a precipitous labour and delivery with no opportunity to provide IAP. Secondly, in everyday clinical practice there are missed opportunities for prophylaxis whichever strategy is adopted. Of the reported cases of EOGBS sepsis in New Zealand in 2009–11, a maternal risk factor was present in 55%, but less than a third of these received IAP. The authors estimated that if all mothers with risk factors had received IAP, the incidence of EOGBS sepsis might have been reduced to 0.17 per 1,000 births. Even though there is evidence that universal screening as recommended can reach >90% of women who deliver at >36 weeks, it is unknown what the uptake would be in New Zealand following the offer of screening in compliance with the Code of Consumer Rights on informed consent. Lastly, the multidisciplinary group considered the costs and logistics of implementing a screening policy in New Zealand could be significant. There would be a greater chance to further reduce the incidence of EOGBS by enhanced support of the already recommended risk-based policy.

**Update from 2004 consensus guideline**

The current guideline recognises that some women will undergo screening at 35–37 weeks and provides guidance to cover that scenario. There is clarification of management following an incidental finding of urogenital GBS colonisation in early pregnancy. Several obstetric scenarios are discussed, and the guideline also explains the recommended antibiotic regimes in light of increasing antibiotic resistance. Because not all cases of EOGBS sepsis will be prevented, recommendations on neonatal management have been retained.

**Future directions**

Development of a rapid point-of-care test for GBS that can be used in early labour
will likely obviate both above approaches. Development of maternal immunisation would be another advancement that would also require future review of guidelines.

For the time being, better dissemination of the consensus guideline will improve prevention of EOGBS. It seems likely that one source of variation in practice is the confusion that arises from differing guidelines. One way to bolster compliance should be to have a single guideline that all are familiar with and can be locally promoted, in a similar way to resuscitation guidelines. The authors would encourage district health boards to adapt their local protocols accordingly, and to directly link to the national consensus guideline. This effort must be coupled with strategies to maximise adherence, such as better information for women about GBS, and clarity in relation to documentation for either paper-based or electronic maternity records. There is always opportunity to reduce variation in practice through education of providers and women when the goal is to further reduce the burden of disease in our newborn babies.

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