New Zealand Paediatric Surveillance Unit

Proven neonatal bacterial or fungal infection in the first week of life.

Background

Early-onset neonatal infections are an important cause of mortality and morbidity in the paediatric population. Group B streptococcus (GBS) is part of the rectovaginal flora in 10-30% of pregnant women and the leading cause of early-onset neonatal sepsis, pneumonia and meningitis. The demonstration that intrapartum antibiotics for high-risk pregnancies interrupt mother to baby transmission of group B streptococcus (GBS), significantly reducing the chance of early-onset GBS sepsis, has led to the widespread adoption of this policy by obstetric providers in many countries.

A national 2-year survey of early-onset GBS sepsis (defined as within 48 hours of birth) in New Zealand's then 19 neonatal units in 1998-99 found the attack rate to be 0.5 cases per 1000 live births. There were 7 cases of meningitis and 1 death (case fatality rate 1.8%; upper 95% CI 9.5%). Of importance, almost 60% of cases were born to mothers with GBS risk factors, but who had not received intrapartum antibiotics. Allowing for the 10% chance that such interventions may be ineffective, complete implementation of a risk-based prevention strategy would have further halved the national attack to only 0.24 cases per 1000 live births.

With these data as background, representatives of the New Zealand College of Midwives, the PSNZ, the New Zealand Committee of the RANZCOG, the RNZCGP and Homebirth Aoteoroa met in 2003. It was decided that adoption of a nationally agreed single GBS prevention strategy would promote further reductions in rates of early-onset neonatal GBS sepsis. Following extensive consultation amongst LMCs and paediatricians, the inter-college consensus working party recommended a risk-based prevention strategy be adopted in New Zealand. Guidance was also given to providers opting to use the universal culture-based strategy recommended in some countries. This policy was launched in September 2004 and is found on the NZ College of Midwives' web site (http://www.midwife.org.nz/index.cfm/Consensus). A key recommendation was to undertake national surveillance of early-onset neonatal GBS and non-GBS cases, and to monitor antibiotic resistance and serotype changes. In order to compare with overseas data, and particularly with Australian data, it has been decided to audit proven sepsis in the first week of life rather than the first 48 hours.

STATEMENT OF RESEARCH QUESTIONS

1. What are the pathogens, incidence rates and outcomes of early-onset neonatal sepsis in New Zealand?
2. What impact have the current consensus-based prevention policies had upon attack rates of early-onset neonatal group B streptococcus (GBS) disease?
3. What proportion of early-onset GBS cases remains potentially preventable by full implementation of a clinical risk-based GBS prevention strategy?
4. What are the antibiotic susceptibilities of invasive neonatal GBS strains?
5. What serotypes predominate amongst invasive neonatal GBS strains?
6. What is the incidence of early-onset neonatal ampicillin-resistant *Escherichia coli* infection in babies with birth weights less than 1500 grams?

CASE DEFINITION

The first week of life is defined as within the first 7 days (168 hours) after birth.

Proven infection is defined as a clinical picture consistent with sepsis* and a positive bacterial or fungal culture **obtained within the first 7 days** from blood, CSF, pleural fluid or other normally sterile site such as joint fluid. The baby must be clinically unwell and have supportive evidence of sepsis, such as an abnormal white blood cell count, thrombocytopaenia, or raised serum C-reactive protein concentration.

In addition to proven infection, cases where there is no positive culture but a positive GBS antigen from CSF or urine (collected via SPA or clean catheter) will also be recorded.

**See over page for examples*

REPORTING INSTRUCTIONS

Clinicians will be asked to report all cases seen in the past month.

**Examples of presentation of early-onset neonatal systemic infection*

- Symptoms and signs vary from overwhelming multi-organ system disease with shock, respiratory failure, meningitis and/or DIC to non-specific symptoms such as fever, lethargy and poor feeding.
- Early-onset GBS disease, particularly, may present initially with only mild respiratory distress and although more likely in the presence of risk factors such as preterm labour, prolonged rupture of the membranes or maternal fever or chorioamnionitis, can equally occur in the absence of these.
- Meningitis may have few specific signs and should usually be looked for when there is a positive blood culture. Meningitis would be consistent with either a positive bacterial culture in the CSF (or positive GBS antigen), or a positive blood culture **and** an elevated CSF white blood cell count ($\geq$ 100 wbc x 10^6/L).

FOLLOW-UP OF REPORTED CASES

A two page questionnaire requesting further details will be forwarded to clinicians that report a case of proven neonatal bacterial or fungal infection in the first week of life to the NZPSU.

If you have any comments or questions please contact either:

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