Early Onset Neonatal Sepsis in Non-Tertiary Neonatal Unit

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Aims

To determine the Incidence of Early Onset Neonatal Sepsis and the Incubation time for growth of bacteria from blood culture.

Introduction

Neonatal sepsis is one of the leading cause of morbidity and mortality. Group B streptococcus (GBS) is the most frequent cause of early onset neonatal sepsis^{1,2}. Incidence of early onset GBS sepsis (EOGBSS) has declined since the introduction of Intrapartum antibiotic prophylaxis to women at risk of transmitting GBS to their babies³. However, there is no single source of hospital data in Australia.

Studies have shown in sepsis, blood culture is positive within 24 hours in 91% cases, 96% in 36 hours and 99% within 48 hours of incubation. Continuing antibiotics for more than 24 hours would capture only one additional patient for every 500-1200 patients⁴.

Methods

This was a descriptive study carried out for six years (01/01/2010 - 31/12/2015) on all new born babies born at Redland Hospital with risk of infection or signs of infection. Redland Hospital is a non-tertiary outer metropolitan hospital in the Brisbane Bayside suburb, Queensland, Australia, serving a population of 190,000 people. Approximately 2000 babies are born/year.

All new born babies suspected of sepsis based on history and clinical examination had blood culture collected before starting antibiotics. Bacteremia was defined as blood culture isolates deemed to be responsible for clinical manifestations. Contaminant isolates were considered as isolates not responsible for clinical manifestations. Blood culture results obtained from Auscare data was analysed using descriptive statistics to identify the frequency of clinically significant and contaminant blood cultures and the incubation time to growth of bacteria. The Bac T/Alert system was used to detect bacterial growth. Ethics approval was obtained from Metro South Health District Human Research Ethics Committee (HREC/15/QPAH/503).

References

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Results

11,977 babies were born between 01/01/2010 - 31/12/2015. A total of 640 (5.34%) blood cultures were collected. 14/640 (2.18%) had positive growth. Only 4/640 (0.62%) (95% CI 0.17-1.59%) had true positive growth of bacteria responsible for clinical illness. All four grew Group B Streptococcus within 15 hours of incubation (median 9.65 hours, inter quartile range 9.2-12.25 hours). Others 10/640 (1.56%) were contaminant. Coagulase negative Staphylococcus was the most common contaminant.

Total blood cultures collected in neonates	640
Total negative blood cultures	626
Total positive blood cultures	14
Total positive blood cultures within 24 hours	9
Total positive blood cultures after 24 hours but withikn 36 hours	1
Total positive blood cultures after 36 hours but within 48 hours	3
Total positive blood culures after 48 hours	1

Pathogens

- Coagulase negative staphylococcus (8)
- Group B streptococcus agalactiae (4)
- Staphylococcus epidermidis (1)
- Bacillus cereus (1)

- Pathogens isolated within 24 hours**
- Group B streptococcus agalactiae at 9, 9.4, 9.9 & 14.6 hours
- Coagulase negative staphylococcus at 20, 20.4, 22.8 & 23.5 hours
- Staphylococcus epidermidis at 21 hours
- Pathogens isolated after 24 hours but within 36 hours**
- Bacillus cereus at 25.9 hours
- Pathogens isolated after 36 hours but within 48 hours**
- Coagulase negative staphylococcus at 36.4 & 44.8 hours
- Pathogens isolated after 48 hours**
- Coagulase negative staphylococcus at 49.4 hours

Conclusions

- Incidence of Early Onset Neonatal Sepsis in our hospital is very low 0.33 cases/1000 live births, comparable to National (0.38 /1000 live births) and Queensland state (0.32 /1000 live births).
- Neonatal sepsis mortality rate is zero.
- Median incubation time to true positive growth of Bacteria is 9.65 hours.
- We recommend stopping antibiotics at 24 hours in babies who remain clinically well and have negative culture.