

Outbreak of a Late-Onset Group B Streptococcus Cluster due to Probable Horizontal Transmission in a Level 3 Neonatal Intensive Care Unit

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Introduction

- ❖ Group B Streptococcus (GBS) is a major pathogen among neonates and young infants.
 - Early onset --occurs within the first week of life, associated with pregnancy-related risk factors.
 - Late-onset --occurs after the first week of life through 3 months, sporadic.
 - Outbreaks of late-onset (GBS) are rare.
- ❖ In February 2017, our 20 bed Neonatal Intensive Care Unit (NICU) identified 2 preterm infants with late-onset GBS infections occurring within a 5 day period, prompting an outbreak investigation and report of a probable link.

Methods

Case Identification

- ❖ A case was defined as culture-confirmed invasive GBS infection in a preterm infant <37 weeks gestational age (GA).
- ❖ Laboratory records for the 4 weeks prior to and 12 weeks following the index case were reviewed to identify additional cases.

Analysis of GBS Isolates

- ❖ Antibiograms compared
- ❖ All 3 isolates referred to NYS DOH Wadsworth Lab for pulse field gel electrophoresis (PFGE).

Other Investigation

- ❖ Hand hygiene compliance
- ❖ Nursery conditions – census, floor plan, incubator proximity
- ❖ Breast milk handling & storage
- ❖ Disinfection of reusable equipment
- ❖ Environmental Services (EVS) procedures

Results

Case Reports

Case 1 (Index Case)

- ❖ 34 6/7 week preterm male, birthweight 855 g, born by caesarian section to a mother with unknown GBS status who developed fever on day of life (DOL) 25, followed by erythema & induration c/w cellulitis below the umbilicus and extending over the groin and buttocks.
- ❖ Blood culture grew GBS
- ❖ CSF culture was no growth
- ❖ Hip/pelvic x-ray, ultrasound, MRI c/w cellulitis plus myositis left anterior thigh muscles, no evidence of septic arthritis.

Case 2

- ❖ 27 5/7 week preterm female birthweight 860 g, born by vaginal delivery to a GBS-negative mother, who developed lethargy and apnea requiring intubation on DOL 39.
- ❖ Blood culture grew GBS (Pen MIC \leq 0.06)
- ❖ CSF culture also positive for GBS.

Lab Record Review

- ❖ No additional GBS cases

Analysis of GBS Isolates

Antibiograms

- ❖ Isolates from the 2 infants had the same susceptibility patterns.
- ❖ All were penicillin susceptible, erythromycin resistant and clindamycin susceptible without inducible resistance.

PFGE

- ❖ PFGE patterns for the 3 isolates were indistinguishable and the isolates were considered to be the same strain.

Results

Hand Hygiene Compliance

- ❖ Compliance measured by anonymous observer had fallen to <90% at the time of the outbreak.

Nursery Conditions

- ❖ Average daily census was high, more than 30% above recommended occupancy, causing overcrowding, decreased distance between incubators.
- ❖ Incubators of Case 1 & Case 2 were adjacent

Breast Milk Handling &Storage

- ❖ No lapses in breast milk storage protocol were identified.

Interventions/Control Measures

- ❖ Contact precautions
-- maintained until repeat cultures negative, antibiotics completed.
- ❖ Breast milk for the affected infants was stored in a separate refrigerator.
- ❖ Enhanced focus on hand hygiene
- ❖ Focus on cleaning of reusable equipment
- ❖ Focus on compliance with EVS procedures
- ❖ CleanTrace/ATP as a monitoring aid and rapid feedback and follow up for failures

Conclusions

- ❖ No environmental factor or clear mode of transmission were identified; however, horizontal transmission was highly suspected.
- ❖ The average NICU census during this time was 27, exceeding the maximum of 20 patients.
- ❖ High census and possible transient hand carriage of GBS by the staff may have played a role in the transmission of GBS.
- ❖ Adherence to hand hygiene and isolation practices were essential in containing the outbreak and preventing further transmissions.

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