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Case Report

Case Report of Neonatal Infections in Twins Acquired from Frozen Expressed Breast Milk (EBM)

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Abstract

This case report describes the occurrence of severe infections in preterm twin neonates linked to the use of frozen expressed breast milk (EBM). Both twins, born at 34 weeks' gestation, had initially presented with transient tachypnea of the new born and did not require antibiotics on admission. On day nine of life, Twin A developed signs of sepsis, including mild abdominal distension and hypotonia, with positive blood and urine cultures within twenty-four hours, revealing Enterococcus Faecalis and Klebsiella Aerogenes. Twin B, on day ten of life, exhibited decreased oral intake and hypotonia, with urine cultures positive within twenty-four hours indicating Klebsiella aerogenes. Both infants received antibiotics therapy, which successfully cleared the infections. Investigation and culture of the EBM used for feeding identified the presence of Klebsiella aerogenes, Enterococcus faecalis, and Staphylococcus epidermidis, establishing the frozen milk as the infection source. This case highlights the critical importance of rigorous screening and safety protocols for handling and storing EBM, and the high index of suspicions for the stored EBM as the source of possible infections in preterm neonates and low birth weight infants who are highly vulnerable to infections.

Keywords: EBM; Neonatal infections; Contamination; Antibiotic therapy

Introduction

Preterm (<37 weeks' gestation) and low birth weight (LBW) (<2.5 kg) infants have limited nutrient reserves at birth, which makes them subject to many physiologic and metabolic stresses that increase their nutrient needs [1]. Formula milks (i.e. artificial/powdered infant formulas) can typically be manipulated to contain higher amounts of nutrients (e.g. protein) than the mother's own milk [2,3]. However, formula milks lack the immunomodulators and nutrients present in human milk that stimulate the immune system, protect the immature gut, and promote neurodevelopment [2,4].

Breast milk, aside from being the optimal source of nutrition, has immunologic properties that prevent infection in neonates [5]; for instance, lysozyme which acts directly against bacteria and indirectly potentiates the bactericidal activity of antibodies [6,7].

Despite the benefits of breast milk on infants, for the reason that admitted NICU patients typically cannot be fed directly, a high reliance on EBM is inevitable [8]. Mostly due to improper protocol follow-through (e.g. incorrect thawing after freezing or storage temperatures) and lack of hygiene when extracting, the prevalence of contamination within NICUs has been highly estimated to reach almost all admitted patients. Moreover, these occurrences have also been found in both manual expressions and breast pumps [9]; which, consequently, hold a concerning high risk of infections and sepsis for the patients.

Sepsis among very low birth weight (VLBW) infants is a major worldwide health care concern in NICUs that has been associated with increased morbidity and mortality [10-12]. Neonatal sepsis is most commonly categorized into early-onset sepsis (EOS),

occurring within the first 72 hours of life, and late-onset sepsis (LOS), occurring 72 hours or later after birth [10,13]. Although EOS is related to maternal and perinatal factors, LOS is more closely related to neonatal and nosocomial factors [10,13-16].

This case report presents the clinical intervention of a set of preterm neonate twins, one presenting with sepsis and the second one with urinary tract infection (UTI)-pyelonephritis.

Case 1

At 34-week gestational age, Twin A was born vaginally to a gravida 1, para 2 Caucasian woman. Artificial Rupture of Membranes (AROM) was recorded at delivery. Maternal serologies and group B streptococcus (GBS) presented all negatives. At birth, the baby developed respiratory distress due to transient tachypnea of the newborn and no antibiotics were given at the time. The indication of preterm delivery resulted from maternal pregnancy induced hypertension (PIH) with severe features. On day of life (DOL) number nine, the baby developed mild abdominal distension and hypotonia. Blood, urine, and cerebro-spinal fluid (CSF) cultures were obtained; in which blood culture grew enterococcus faecalis, and urine culture, collected through urinary catheterization, grew enterococcus faecalis and klebsiella aerogenes. Following that, the patient received ten days of antibiotics. Repeated blood and urine cultures after the completion of antibiotic therapy showed no organisms.

Case 2

At 34-week gestational age, Twin B was born vaginally to a gravida 1, para 2 Caucasian woman. Artificial Rupture of Membranes (AROM) was seen at delivery. Maternal serologies and group B streptococcus (GBS) presented all negatives. At birth, the baby developed respiratory distress due to transient tachypnea of the newborn and no antibiotics were given for the time being. The indication of preterm delivery was ordered due to maternal pregnancy induced hypertension (PIH) with severe features. On day of life (DOL) number ten, the baby developed decreased breast milk oral intake and mild hypotonia. Blood, urine, and cerebro-spinal fluid (CSF) cultures were obtained; where only the urine culture, collected through urinary catheterization, grew Klebsiella aerogenes. Subsequently, the patient received seven days of antibiotics. Repeated blood and urine cultures after completion of antibiotic therapy showed no presence of organisms.

Results

With the speculation of infection in both twins, the stored expressed breast milk samples that were used for feeding these patients were sent to the microbiology laboratory for aerobic and anaerobic cultures. Confirming the belief; Klebsiella aerogenes, enterococcus faecalis, and staphylococcus epidermidis colonies grew on both samples.

Discussion

Considering the details of this case report, the occurrence of grave infections in preterm twin neonates was traced to the frozen expressed breast milk (EBM) that was used for feeding these patients, which was administered through orogastric tubes. With the twins being born at 34 weeks' gestation, they both initially presented with respiratory distress that was not treated with antibiotics at first. Ultimately, Twin A presented signs of sepsis, mild abdominal distension, and hypotonia on day nine of life, Twin B exhibited decreased oral intake and hypotonia on day ten of life. Additionally, Twin A's urine and blood cultures confirmed the presence of Enterococcus Faecalis and Klebsiella Aerogenes, whereas the urine cultures of Twin B just presented Klebsiella Aerogenes. To treat these infections, both patients received antibiotic therapy.

Conclusion

This case highlights several important points. Preterm infants are especially vulnerable due to their underdeveloped immune systems, making them highly susceptible to infections from non-sterile EBM. Proper hygiene during the expression storage, and handling of EBM is essential, including maintaining sterile conditions, appropriate storage temperatures, and correct thawing procedures. Additionally, raising awareness about the risks of contaminated EBM in NICUs is crucial. Evidence-based protocols and educational interventions for both mothers and staff can help reduce these risks [17].

In conclusion, the infections in these preterm twins underscore the importance of strict protocols for EBM storage and administration. The presence of pathogenic bacteria in the EBM serves as a reminder of the need for enhanced safety measures to protect vulnerable infants in the NICUs.

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Ethical Guidelines

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Consent for publication

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Conflict of Interest

The authors declare that they have no competing interests.

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