Pulmonary Hemorrhage: A Case Study

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Introduction

Pulmonary hemorrhage (PH) poses a significant risk of mortality and morbidity to preterm infants in the Newborn Intensive Care Unit (NICU). The incidence of PH is up to 50 per 1000 live births for high-risk groups and has a mortality rate of 50% in preterm infants. It usually occurs on days of life (DOL) 2-4, with the incidence dropping dramatically after the first week, and for babies greater than 32 weeks estimated gestational age (EGA). Serious pulmonary hemorrhage doubles the risk of significant neurodevelopmental outcomes.

Case Presentation

History of Present Illness: A 28 6/7-weeks EGA female infant was admitted directly to the NICU for prematurity. Her birth weight was 785 grams. Standard resuscitation and care were provided following this NICU's extremely low birthweight (ELBW) protocol. Apgar scores were 7 and 9. The infant eventually stabilized on CPAP at 6 cm of water and 21% oxygen. She received Vitamin K and caffeine by one hour of life, and darbepoetin alfa at 3.5 hours of life. Her physical exam was unremarkable. Her initial chest x-ray (CXR) at 40 minutes of life showed mild haziness.

Hospital Course: On DOL 1, oozing was noted from previous IV attempt sites. Clotting times were increased on her coagulation panel and fibrinogen was low. Cryoprecipitate was given. That evening, she started to have episodes of apnea and bradycardia. During one, the respiratory therapist noted blood coming from her mouth. A code was called and her heart rate remained at 50 despite adequate positive pressure ventilation with a mask and T-piece. Further resuscitation included endotracheal (ET) intubation, chest compressions, epinephrine via IV and ET tube, and a normal saline bolus. She responded well to treatment and was placed on a high-frequency oscillating ventilator (HFOV). Over the next two hours, surfactant was administered and she was given packed red blood cells and cryoprecipitate. Blood cultures were drawn and antibiotics started. She remained on HFOV with persistent intermittent bleeding from her ETT and coagulopathy through DOL 6.

Labs, Images, Studies: On DOL 6 an echocardiogram showed a large hemodynamically significant patent ductus arteriosus (PDA). A 7-day course of acetaminophen started on DOL 7, after which the PDA closed, and she was weaned from ventilator support to CPAP.

This infant survived and went home at around 40 weeks EGA on low-flow nasal cannula oxygen.

Discussion

This infant had several risk factors for PH including preterm birth, extremely low birth weight, intrauterine growth restriction, maternal hypertension, and a hemodynamically significant PDA (hsPDA). Treatment of hsPDA varies widely between providers. Careful consideration of risk factors with a more standardized yet individualized approach to treating hsPDAs may help prevent PH.

Conclusion

This infant is in the 50% that survives PH but she is still at risk for long-term developmental delays. Practitioners in the NICU need a good understanding of the risk factors and treatment for PH to provide the best possible care to their patients.

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