H14 Multiple Thromboses in a Case of Neonatal Dehydration and Failure to Thrive

Kristine D. Song, BA, University of Kentucky, Dept of Pathology, 315 Broadleaf Lane, Lexington, KY 40503; Beth E. Frost, DO, 126 Wabash Drive, Lexington, KY 40503; Meggen A. Walsh, DO, University of Kentucky, 800 Rose Street, Lexington, KY 40511; Sarah A. Higdon, MD, University of Kentucky, 800 Rose Street, Lexington, KY 40511; Cristin M. Rolf, MD, State of Alaska, MEO, 5455 Dr MLK Jr Avenue, Ankorage, AK 99507; and Gregory J. Davis, MD, UK Medical Center, MS 117, 800 Rose Street, Lexington, KY 40536-0298*

After attending this presentation, attendees will be more familiar with the antemortem signs and postmortem findings that may mimic neglect or head trauma in breast-fed infants with hypernatremic dehydration and failure to thrive.

This presentation will impact the forensic science community by explaining the ways in which intracranial hemorrhage and the physical signs of possible dehydration may be mistaken by the prosecting pathologist for blunt force trauma or child abuse and neglect. Early recognition and monitoring of this condition by medical professionals may prevent the occurrence of avoidable complications of hypernatremic dehydration, including death.

The following is a case of multiple thromboses in an infant with failure to thrive and dehydration. This case demonstrates findings of vascular thromboses in end organs mimicking trauma in an infant.

A 13-day-old White male was found at 2:45 a.m. crying alone in a bassinet and was experiencing difficulty breathing. No pillows or blankets were reported in the bassinet with the infant. After feeding, the mother noted skin color changes and took the infant to the hospital at 4:15 a.m. The emergency department records reported shortness of breath and cyanosis of the hands and feet, lethargy, dehydration, and a two-pound weight loss since birth. The infant was intubated, but normal oxygen saturation was not achieved. He was subsequently transported to a different hospital where he sustained cardiopulmonary arrest at 5:25 a.m. Advanced cardiac life support efforts were initiated and intraosseous access was obtained, followed by normal saline infusion. Resuscitation efforts continued for 45 minutes and the child was pronounced dead at 6:00 a.m. Notification of death was received by the coroner, who sent the body to the medical examiner's office for autopsy.

At autopsy, the infant was markedly thin and demonstrated "tenting" on traction of the skin. Body weight at autopsy was 5lbs, 4oz compared to 7lbs, 15oz at birth. The oral mucosa was dry and the periorbital fat was diminished, giving the eyes a sunken and prominent appearance. Internal examination revealed minimal subcutaneous and visceral fat. Extravasated blood was in the right nephric space. Dissection of the viscera revealed multiple thromboses involving the pulmonary arteries with a wedge infarct of the left lung, the right renal vein with deep congestion of the kidney, and dural sinus thrombosis with hemorrhagic leukomalacia. No trauma was identified on or within the body. Hemorrhage of the brain was non-traumatic, ruling out physical injury to the head. Vitreous humor was inadequate for electrolyte analysis. Postmortem toxicologic examination was negative for drugs and ethanol; postmortem blood cultures were non-contributory.

Findings in this case such as brain hemorrhage and skin tenting suggestive of dehydration may be mistaken for blunt force injury or child abuse/neglect; however, this pattern of severe dehydration, weight loss, apnea, and death cannot simply be attributed to neglect or failure to thrive. Breast-feeding associated hypernatremic dehydration has been described in at least 178 infants in the literature since 1979.[1] Interestingly, like the infant in this case, all of these infants were reportedly born at term without complication or abnormalities.[2] Complications of this condition may include acute renal failure, elevated liver enzymes, disseminated intravascular coagulation, cerebral edema, intracranial hemorrhage, cavernous sinus thrombosis, and bilateral iliac artery thrombosis.[1,2]

Inadequate volume of vitreous humor precluded the evaluation of sodium and urea nitrogen concentration; however, the findings in this case show such a striking resemblance to specific reports of hypernatremic dehydration and associated complications of weight loss, cerebral edema, transverse sinus thrombosis, and death in infants around the second week of life that it is the most likely cause of death.[3,4]

The incidence of neonatal hypernatremia in breast-fed infants has been reported to be as high as 4%; therefore, the need for recognition and monitoring by health professionals is paramount.[1] Early detection and monitoring for hypernatremia may prevent an occurrence of this rare complication; awareness by medical examiners may prevent erroneous assumptions of abuse or neglect.

Copyright 2015 by the AAFS. Unless stated otherwise, noncommercial *photocopying* of editorial published in this periodical is permitted by AAFS. Permission to reprint, publish, or otherwise reproduce such material in any form other than photocopying must be obtained by AAFS.

References:

1. Unal S, Arhan E, Kara N, Uncu N, Aliefendioglu D. Breast-feeding-associated hypernatremia: Retrospective analysis of 169 term newborns. Pediatrics International 2008;50(1):29-34.
2. Moritz ML, Manole MD, Bogen DL, Ayus JC. Breastfeeding-Associated Hypernatremia: Are We Missing the Diagnosis? Pediatrics 2005: 116e; e343.
3. Gebara BM, Everett K. Dural Sinus Thrombosis Complicating Hypernatremic Dehydration in Breastfed Neonate. Clinical Pediatrics 2001:40:45-58.
4. Amerongen RH, Moretta AC, Gaeta TJ. Severe hypernatremic dehydration and death in breast-fed infant. Pediatric Emergency Care 2001: 17(3):175-80.

Dehydration, Neonate, Thromboses

Copyright 2015 by the AAFS. Unless stated otherwise, noncommercial *photocopying* of editorial published in this periodical is permitted by AAFS. Permission to reprint, publish, or otherwise reproduce such material in any form other than photocopying must be obtained by AAFS.