H21 Infant Death Following Home Birth: A Case Report of Fatal Hypoglycemia in a Neonate

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After attending this presentation, attendees will better understand the importance of maternal clinical history, the histologic autopsy findings, and the role of Immunohistochemistry (IHC) in diagnosing islet cell hyperplasia in infant deaths due to hypoglycemia.

This presentation will impact the forensic science community by reviewing a case of fatal neonatal hypoglycemia in an infant born to a diabetic mother and by discussing the autopsy findings that can be used to support that cause of death.

Background: Pancreatic Islet Cell Hyperplasia/Hypertrophy (ICHH) refers to a proliferation and increase in size of the insulin-producing beta cells of the Islets of Langerhans in response to elevated serum glucose levels. ICHH is a common finding in Infants of Diabetic Mothers (IDMs) and a known risk factor for neonatal hypoglycemia. Although most cases are transient, neonatal hypoglycemia can be severe, resulting in infant death. Because hypoglycemia cannot be reliably diagnosed postmortem, ICHH may be the only diagnostic finding in infant deaths related to hypoglycemia, warranting histologic evaluation of the pancreas in all autopsies of IDMs.

Case Report: An infant girl at 37 weeks and 3 days gestation was delivered at home with midwife attendance to a 36-year-old *Gravida* 4 *Para* 3 (G4P3) mother with a history of insulin-dependent gestational diabetes and newly diagnosed, poorly controlled type 2 diabetes mellitus. The mother's previous pregnancy was reportedly complicated by gestational diabetes and transient neonatal hypoglycemia. At delivery, APGAR scores were seven and ten at one and five minutes, respectively; however, several hours after birth, the infant was reportedly not feeding well and was found to be severely hypoglycemic (28mg/dL). Formula and sugar water were administered, bringing the blood sugar to 48. Despite this, the heart rate decreased to 74 and the pulse oximetry went to 68. Emergency Medical Services (EMS) were called and the midwife immediately started Cardiopulmonary Resuscitation (CPR). The infant was transferred to an outside hospital and resuscitated for 70 minutes before being pronounced dead.

Methods: An autopsy was performed in addition to a review of the literature.

Results: External examination revealed the infant to be macrosomic (10 pounds at 11 hours of age) but otherwise without developmental abnormalities. The umbilical stump was desiccated but without purulence or drainage. Autopsy did not reveal evidence of trauma or significant natural disease. The placenta was not submitted for examination. Histologic examination of the pancreas revealed marked hyperplasia/ hypertrophy of the islet of Langerhans and insulin-producing beta cells. The cause of death was determined to be complications of neonatal hypoglycemia.

Discussion: A diagnosis of neonatal hypoglycemia should be considered as a potential cause of death or contributing factor in IDMs who have severe pancreatic islet cell hyperplasia and hypertrophy at autopsy. The finding of ICHH, although not specific, is strongly suggestive of maternal glucose dysregulation and may aid a pathologist in determining the cause of death in infants, particularly in the setting of absent maternal clinical history, prenatal care, and birthing history.

Islet Cell Hyperplasia, Neonatal Hypoglycemia, Infants of Diabetic Mothers

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