

HYPERAMMONEMIA AND NEONATAL UREA CYCLE DISORDERS

Full-term neonate with symptoms of hyperammonemia starting on day 2

Patient presentation and history:

A 3-day-old female—delivered by C-section at 39 weeks (after a normal pregnancy) and weighing ~7.7 pounds at birth—was admitted to the hospital with reports of recurrent seizures (involving hypertonia and upper limb spasms) and rapidly progressive poor feeding, low activity, and tachypnea beginning on day 2 after birth. At admission, the patient was unconscious, absent primitive reflexes, and moderately jaundiced. The patient also had respiratory symptoms (coarse rales) and hypotonia. The patient was placed on mechanical ventilation. Family history was unremarkable, with no documented congenital diseases. Differentials included dysfunction of multiple organs and systems, sepsis, upper digestive tract bleeding, and intracranial infection.

Symptoms were relieved with aggressive therapy but then returned. Feeding difficulty became the main problem, which was followed by seizures, tachypnea, vomiting, dyspnea, and lethargy.

Findings:

- At admission:
 - Vital signs: high normal to moderately elevated; body weight: ~6.7 pounds
 - Peripheral blood counts and blood gases: normal
 - Elevated levels of alanine aminotransferase and unconjugated hyperbilirubinemia; mildly elevated serum creatinine level
 - Hypoglycemic, hypernatremic, and hyperchloremic
 - Mildly prolonged prothrombin time
 - Pneumonia with atelectasis in right lung; negative sputum culture, blood culture, and cerebrospinal fluid exam
- At return of symptoms, following brief respite:
 - White matter brain abnormalities shown on MRI
 - Respiratory alkalosis with or without metabolic acidosis
 - Serum citrulline level: low; urine gas levels: normal
 - Plasma ammonia level: >500 $\mu\text{mol/L}$ (normal <100 $\mu\text{mol/L}$)

Outcome: Plans to treat hyperammonemia were implemented, but the parents decided to discontinue medical care.

Final diagnosis: CPS1 (carbamoyl phosphate synthetase 1) deficiency, a rare urea cycle disorder, based on genetic testing

Summary: Neonatal-onset of CPS1 deficiency caused severe, rapidly progressive hyperammonemia and associated clinical manifestations, resulting in death.

Case source: Yang X, Shi J, Lei H, Xia B, Mu D. Neonatal-onset carbamoyl phosphate synthetase 1 deficiency: a case report. *Medicine* 2017;96:26.
<http://bit.ly/2lcJElc>