Primary Hyperoxaluria Type-1: An Unprecedented Presentation at Birth

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This report describes a male baby with primary hyperoxaluria type-1, presenting at 5 hours of age with cyanotic episodes, hypotonia, unexplained techypnea and tachycardia. This infant also had renal calcinosis, and middle cerebral arterial infarct with unilateral enlargement of ventricle and left porencephalic cyst on CT scan. The infant improved with diuretics, water supplementation, pyridoxine, and Albright solution.

Key words: *AGXT-Alanine Glyoxalate Aminotransferase, PH1 (Primary hyperoxaluria type one).*

PH1 is an extremely rare autosomal recessive peroxisomal disorder where Alanine Glyoxalate Aminotransferase (AGT) is deficient or absent. PH1 generally presents in teen age though can present between 1- 40 years of age. We report a case presentating at birth (with a probable fetal onset).

Case Report

A full term male baby delivered by emergency cesarean section to Asian parents, who were first cousins. Birth weight of the baby was 3.6 Kg and apgars were seven at one minute and nine at five minutes respectively. The antenatal history was uneventful. There was a family history of PH1 in elder twin siblings who were diagnosed at post infancy age and had hepatorenal transplants at preschool age. At 5 hours of age, the baby developed severe unexplained hypotonia and cyanotic episodes. The investigations revealed hemoglobin 20.2 gm/dL, WBC 10,000, blood cultures negative with normal CRP, *X*-ray chest normal. Urea and electrolytes were normal except ionised calcium of 3.6 mmol/L. BUN was 8 mg/dL and creatinine was 1.1 mg/dL. Urine analysis revealed that urine oxalates were 3+, urine oxalate to creatinine ratio was 632.8 with elevated urinary glycolates, four hydroxyl-phenylelactate and hydroxyphenyle-butarate. Torch antibody screen and urinary CMV were negative. Karyotyping revealed a 46 XY karyotype, FISH test for Prader-Willi syndrome and myotonic dystrophy was negative. ECG and Echocardiography were normal. A metabolic screen was normal. CPK was 50 units. Parathyroid hormone-2.00Pmmol/L. Renal ultrasonography revealed renal calcinosis with echo dense parenchyma. Cranial Ultrasound and Cranial CT scan showed large mature left sided middle cerebral arterial infarct with total liquefaction of that area of brain, ipsilateral ventricular dilatation and large left porencephalic cyst on day 12 of life. The diagnosis of PH1 was made. The child improved with oral diuretics, extra supplementation of water, B-complex, and potassium orally. However, he continued to remain hypotonic with feeding difficulties, poor neonatal reflexes. Baby was discharged home on tube feeding and under care of community pediatric and subspecialty care on home management plan on day 30th of life.

Discussion

In PH1, oxalate is excessively produced in

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liver and slowly accumulates in the blood so exceeds renal threshold and precipitates as calcium oxalate crystals in kidneys(2). Once the kidneys are involved, the renal threshold decreases making the blood supersaturated with oxalates. These oxalate crystals deposit in different body organs over time, giving rise to a condition called oxalosis later leading to various organ failures. The treatment is targeted to start before renal failure or oxalosis. The radical treatment is liver transplant as soon as possible (ideally before renal failure) or joint renal and hepatic transplant. The patient is treated with diuretics B complex, extra water supplementation and potassium supplementation while waiting for the transplant. The alternate ways have to be explored for delivering the treatment and managing the baby inutero to deliver her/him undamaged and safe so that curative treatments could be offered after birth effectively(3). The possible explanations for fetal presentation could be because of low GFR, high oxalate production and relative dehydration in the fetal life(1). The clinical presentation of PH I can vary greatly, ranging from a mild form with recurrent urolithiasis or moderate nephrocalcinosis to a rapidly progressive infantile form with early renal failure(5). Disease severity is not defined by the level of AGT-enzyme activity, as patients with a low activity can present with a mild form and others having a higher AGT activity may have to be treated by maintenance hemodialysis very early. The rapid disease progression in most of the younger patients shows clearly that an early diagnosis and an adequate therapy is crucial(4).

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