CASE REPORT

HYPERAMMONEMIA-HYPERORNITHINEMIA-HOMOCITRULINEMIA (HHH SYNDROME)

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HHH Syndrome is rare inherited autosomal recessive disorder resulting from deficiency of N-acetylglutamate synthetase lead to defect in transport of ornithine from cytosol in to mitochondria lead to hyperornithenemia, hyperammonimemia, homocitrulinemia. Two month old male child presented with recurrent vomiting, Failure to thrive. Diagosed by plasma ammonia, plasma aminoacid by MS/MS.

Key words: hyperornithenemia, hyperammonimemica, homocitrulinemia

Inborn errors of metabolism (IEM) are of concern in India, the spectrum being wide, varied and poorly diagnosed. Population based studies indicate tyrosinemia, maple syrup urine disease and phenylketonuria to be the commonest inborn errors of amino acid metabolism among newborns in India.
2-month-Old male Child First in Birth Order born of non-consanguineous marriage  Presented with Recurrent Vomiting ,Lethargy, Failure to thrive.

He was born PT 35weeks with birth weight of 1.8kg Small for date. At the age one month hospitalized for septic shock. He was on breast feed and dairy milk without dilution and sugar.

On examination, weight is 2kg ,length is 47 cm, and HC was 32cm. There is no dysmorphisms, hepatosplenomegaly, specific odor in urine. His hemogram ,sepsis screen ,serum electrolyte ,BUN ,creatinine , s.acetone were normal. Urine for reducing substance absent. Serum ammonia was 193micromol/liter. In ABG analysis PH 7.29 PCO2 12, bicarbonate 5.6 and PCO2 s 12 . Fundus is normal.
Plasma aminoacid( micromole per liter ) by Tandem mass spectrometry
Arginine 146 (12-130)
Leucine 389(50-150)
Ornithine 470(20-100)
Ornithine/citruline 7.3 (<1.7)

He was treated with low protein deit (1.2gm/kg/day). To provide adequate calories MCT oil and sugar added in Express Brest milk. Sodium bezoate 250mg/kg/day is used for hyperammonimea.
On follow up baby gain 600 gm weights in last twenty day

DISCUSSION: HHH is a genetic/metabolic disorder caused by a defect in the mitochondrial ornithine transporter, ORNT1. Which has been mapped to band 13q14

Hyperornithinemia-hyperammonemia-homocitrullinemia (HHH) syndrome is a very rare inborn error of metabolism that varies widely in age of presentation and long-term prognosis. Internationally only about 50 cases have been reported. Growth and developmental delays, learning disabilities (especially speech delay), periodic confusion and ataxia are typical presenting symptoms. Here recurrent vomiting, and failure to thrive and intolerance of formula feed are main presenting feature. Plasma ammonia,and plasma aminoacid pattern suggestive of HHH SYNDROME. Coagulation factors VII and X should be measured and may be deficient. The amount of $^{14}$C Ornithine incorporated into fibroblasts from patients with HHH syndrome typically is only 15% of that incorporated into control fibroblasts. This test has been extremely useful in the diagnosis of HHH syndrome.
Ornithine and citrulin supplementation reduces ammonia levels in some patients used. Sodium benzoate and sodium phenyl acetate and sodium phenyl butyrate may reduce ammonia levels by providing an alternative pathway. Hyperammonemic crisis might be managed with short-term protein restriction and IV fluids containing large amounts of glucose followed by slow reintroduction of small amounts of protein.

Consultations: A comprehensive team approach is justified and should include a physician with expertise in treating metabolic diseases, a clinical biochemical geneticist, a developmental pediatrician, a neurologist, and other development specialists. This team should assess all aspects of cognitive function and monitor the patient periodically for development surveillance. A nutritionist with expertise in treating metabolic diseases also should be consulted.

First-trimester diagnosis of HHH syndrome may be achieved by study of the incorporation of [14 C] ornithine into proteins of chorionic villi cells, Amniocytes.

REFERENCE


6. Shimizu H, Takeaway K, Eton Y: Abnormal urinary excretion of polyamines in HHH syndrome (hyperornithinemia associated with hyperammonemia and

