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Letter to the Editor

Hyperammonaemic encephalopathy due to arginase deficiency: A rare phenotype with novel variant in *ARG1* gene

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Dear Editor,

Hyperammonaemia is a medical emergency.[1] Acute hyperammonaemia due to proximal urea cycle disorder is known but the same due to arginase deficiency is rare. The usual phenotype of arginase deficiency is spasticity, developmental delay and seizures.[2] Here, we report an Indian boy with arginase deficiency presenting as encephalopathy.

A 25-month-old boy born to non-consanguineous marriage with a normal birth history presented with developmental delay, vomiting and lethargy for 3 weeks. Developmentally child attained standing, pincer grasp, bisyllables and stranger anxiety. On examination, a head circumference of 47 cm (−1.01 SD), weight of 9 kg (−2.76 SD), irritability, spasticity in all limbs, brisk deep tendon reflexes and bilateral extensor plantar response were noted. Complete hemogram, liver function test, renal function test and lactate were all normal. Serum ammonia was raised 280 micromol/L (normal: 13–56). Tandem mass spectrometry showed elevated arginine 407.13 (normal: 3.00–130.00) and glutamic acid was 318.45 (normal: 66.00–236.00). Magnetic resonance imaging of the brain showed non-specific white matter signal changes in the bilateral cerebral white matter. Exome sequencing showed a homozygous variant: c.861delC (p.Pro288HisfsTer10) in exon 8 of *ARG1* (ENST00000356962.2) gene. Parents were heterozygous carriers of the same variant. The child was started on sodium benzoate at 250 mg/kg/day, carnitine, arginine-free formula and symptomatic therapy. The child regained consciousness after 3 days, attained milestones and started walking independently.

Here, we report a child with hyperammonaemia encephalopathy secondary to arginase deficiency. The possible mechanisms of neural injury in hyperammonaemic encephalopathy are neurotoxicity due to glutamine accumulation which is an excitatory neurotransmitter.[3,4] The mutation detected in the current case c.861del causes a frameshift, is a novel variant and is classified as pathogenic as per ACMG criteria. For any child presenting with hyperammonaemia suggesting a defect in urea cycle disorder, a possibility of arginase deficiency should be kept even though rare in addition to other subtypes.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Conflicts of interest

There are no conflicts of interest.

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