

Recurrent Severe Hypoglycemia due to Isolated Growth Hormone Deficiency

A 6-year-old boy presented to us with repeated episodes of seizures since early infancy. He was born small for gestational age to non-consanguineous parents at term. During neonatal period, he suffered multiple episodes of hypoglycemia requiring intravenous dextrose but no etiological investigations were done. Three of the four hypoglycemic events beyond neonatal age were associated with seizures. There were no precipitating factors for hypoglycemia such as prolonged fasting, an intercurrent illness or intake of medications. There was no family history of similar illness, metabolic disorders or an unexplained death.

On examination, he was short (106 cm, -2.02 z-score) and underweight (13.8 kg, -3.15 z-score) and had normal head circumference (52.0 cm) and stretched penile length (4.5 cm). The systemic examination, including neurological examination, was unremarkable. The routine hematological and biochemistry parameters were normal. The critical sample taken at blood sugar of 47 mg/dL showed blood ketones 1.1 mmol/L (normal, <0.6 nmol/L), insulin level 0.38 IU/mL (normal, <2 IU/mL), thyroid stimulating hormone 0.94 mIU/L, prolactin 6 ng/ml (normal 5-20 ng/mL), and cortisol 250 nmol/L (normal >150 nmol/L). However, growth hormone (GH) level was 3 ng/mL (normal >10 ng/mL). Tandem mass spectrometry and urinary organic acid profile were within normal limits. During GH stimulation testing, the peak GH values after insulin and clonidine stimulation were <5 ng/mL. Magnetic resonance imaging of the brain showed normal pituitary gland morphology. A final diagnosis of isolated GH deficiency was considered. The child was started on GH replacement (0.18 mg/kg/week). No further hypoglycemic events were observed over a follow-up period of two years.

Hypoglycemia is rare after infancy and may occur in disorders of carbohydrate and fat metabolism,

hyperinsulinism, ketotic hypoglycemia and hormonal deficiencies such as cortisol, GH and thyroxine [1]. GH deficiency may occasionally manifest as recurrent hypoglycemia as seen in our patient. The mechanisms of hypoglycemia in GH deficiency are increased insulin sensitivity and hypoglycemia unawareness [2]. Additionally, GH deficiency impairs carbohydrate metabolism resulting in decreased basal insulin level, impaired insulin secretion and carbohydrate intolerance with reactive hypoglycemia [1,2]. Although hypoglycemia is described in GH deficiency, severe symptomatic hypoglycemia is extremely rare and usually occurs in association with another causative factor such as glycogen storage disorder [3,4]. Children with even complete GH deficiency do not usually manifest hypoglycemia [5]. Our patient unusually developed recurrent episodes of severe symptomatic hypoglycemia due to an isolated GH deficiency.

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