Persistant Hypoglycemia in Children: Hyperinsulinemia

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Abstract

Congenital hyperinsulinemia occurs due to inappropriate insulin secretion from beta cells of the pancreas. It is the most common cause of resistant and recurrent hypoglycemia in neonates and infants and the threatment is very difficult. Although the incidence is reported as 1/50000, it is seen more frequently in consanguineous countries. Patients may present with lethargy, nourishment, irritability and seizures. If it is not treated, severe hypoglycemia may result in severe neurological damage. High glucose requirement in the diagnosis of congenital hyperinsulinism, detectable insulin level and ketone negativity are the key findings during hypoglisemia. Approximately 45-55% of the patients have an underlying genetic etiology. The most common mutations are ABCC8, KCNJ11, GLUD1 HADH, GCK, SLC16A1 hepatocyte nuclear factor 4 alpha and 1 alpha. In the treatment of drugs such as diazoxide, octreotide, nifedipine may be used, while some patients may require surgical treatment.

Here,the aim of this study was to evaluate the clinical, genetic and therapeutic responses of hyperinsulinemia patients.

37 w girl
BW:4100 gr
Diagnosis: first 1 week
At the moment of the hypoglisemia:
İnsulin:59,6uIU/mL
C peptide:9,93 ng/mL
Cortisol:18,6
Genetic:c·2113C>T/c·4017G>A heterozygous mutation of ABCC8 gene
Subtotal and total pancreotectomy was performed after hypoglycemia persisted despite multiple treatments·Postop diabetes developed and insulin was started· Now she has regulated glucose·

38 w boy
BW:3750 gr
Diagnosis:first 1 week
At the moment of the hypoglisemia:
İnsulin: 26,65 ulU/mL
C peptide:4,87 ng/mL
Cortisol:42,90 mg/dL
GH:9,59 ng/mL
Genetic: c·2113C>T/c·4017G>A heterozygous mutation of ABCC8 gene
Subtotal and total pancreotectomy was performed after hypoglycemia persisted despite multiple treatments·Postop diabetes developed and insulin was started· Now he has regulated glucose·

38 w kız
BW:4490 gr
Diagnosis:İlk 1 hafta
At the moment of the hypoglisemia:
İnsulin: 17,13 ulU/mL
C peptide:9,54 ng/mL
Cortisol:63,44 mg/dL
GH:9,22 ng/mL
Genetic: c·2113C>T/c·4017G>A heterozygous mutation of ABCC8 gene
Diazoxide and octreotide treatments were started, but the patient died due to severe sepsis induced intestinal perforation

38 w boy
BW:4500 gr
Diagnosis:PN 5th day convulsiyon
At the moment of the hypoglisemia:
İnslulin: 8,34 ulU/mL
C peptide: ng/mL
Cortisol:5,1 mg/dL
GH:18,9 ng/mL
Genetic Chr11:g·17426198C>A homozygous mutation of ABCC8 gene Chr4:g·108911107C>T heterozygous mutation of HADH mutasyon
Diazoxide and octreotide treatments was started, now he has regulated glucose·

38 w boy
DA:4100 gr
Diagnosis:PN 6th day
At the moment of the hypoglisemia:
İnsulin: 72,07 ulU/mL
C peptide:11 ng/mL
Cortisol:4,18 mg/dL
GH:10,16 ng/mL
Genetik: c·1433C>A heterozygous mutation of ABCC8 gene
At first subtotal pancreotectomy was performed after hypoglycemia persisted despite multiple treatments· Then total pancreotectomy was performed· Postop diabetes developed and insulin was started· Now she has regulated glucose·

40 w boy
DA:2160 gr, 1' cousin marriage
Diagnosis:1,5 month
At the moment of the hypoglisemia:
İnsulin: 9,9 ulU/mL
C peptide:3,93 ng/mL
Cortisol:17,4 mg/dL
GH:12 ng/mL
Genetik:There were no mutations of ABCC8, GCK, KCNJ11 genes
Regulate blood sugars with diazoxide treatment·

34 w girl
DA:2575 gr
Diagnosis:PN 9 th day
At the moment of the hypoglisemia:
İnsulin: 25,92 ulU/mL
C peptide:6,11 ng/mL
Cortisol:1,49 mg/dL
GH:18,1 ng/mL
Genetic: c·148 C>T p·Arg50Trp heterozygous mutation of KCNJ11 gene
Octreotide was started in the patient who developed pulmonary hypertension with diazoxide· Now she has regulated glucose·

Premature birth? boy
BW:?, he has otism
Diagnosis:8 year 5 month
At the moment of the hypoglisemia:
İnsulin: 19,93 ulU/mL
C peptide:3,31 ng/mL
Cortisol:10,74 mg/dL
GH:0,47 ng/mL
Genetic: c·271 G>C p·V91L mutation of GCK gene
Hypoglycemia persisted despite multiple treatments·The patient was suggested pancreotectomy but the family did not accept·

Result:

Hyperinsulinemia is more common in countries such as our country where the rate of consanguineous marriage is high. Early detection and treatment of hypoglycemia is very important for the prevention of neurological sequelae. Here, we wanted to draw attention to this group of diseases that are quite difficult to manage.