**ABCC8 MODY in an Obese Adolescent Misdiagnosed with Type 2 Diabetes**

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**Background-Aim**

The ABCC8 gene encodes the sulfonylurea receptor 1 (SUR1) subunit of the pancreatic beta cell ATP-sensitive potassium (KATP) channel. Activating mutations in the ABCC8 gene cause both transient and permanent neonatal diabetes mellitus (DM) or MODY 12. In relation to the variant in the ABCC8 gene, patients may also present with either neonatal hyperinsulinism and/or DM later in life. Besides, the same variant can cause different phenotypic features among family members. Response to the sulfonylurea treatment may vary between patients.

**Aim:** To present the clinical features and response to sulfonylurea treatment in an obese adolescent misdiagnosed with type 2 DM, who was later found to have a heterozygous variant in the ABCC8 gene.

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**Case**

13 years old, girl

**Complaint:** Hyperglycemia in routine laboratory examinations, no additional complaints (polyuria, polydipsia, nocturia, weight loss etc.)

**Medical history:** Term, 4500 g birth weight, no chronic disease and hypoglycemia/hyperglycemia in the neonatal period

**Family history:** Unrelated parents

Mother, diabetes mellitus for 3 years, oral anti-diabetic treatment

Father, diabetes mellitus for 6 years, insulin treatment

Grandmother, diabetes mellitus, oral anti-diabetic treatment

**Physical examination**

- Weight +3.43 SDS
- Height +1.22 SDS
- BMI +2.63 SDS
- Puberty Tanner stage V
- Acanthosis nigricans +
- Rest of the physical examination normal

**Laboratory findings (at diagnosis)**

- Fasting serum glucose: 332 mg/dL (N, 60-100)
- Fasting insulin: 37.4 mIU/mL (N, 2.6-24.9)
- C-peptide: 5.69 ng/mL (N, 0.9-7.1)
- HbA1c: 10.4% (N, 4-6%)
- Anti-glutamic acid decarboxylase: Negative
- Anti insulin antibody: Negative
- Urine ketones: Negative
- Blood gas analysis: Normal

**Clinical Follow-up**

- Type 2 diabetes mellitus
  - Metformin (2x1000 mg)
  - Insulin glargine (0.25 U/kg/day)

- Diabetes in three generations
  - Negative diabetes antibodies
  - Unable to discontinue insulin

- MODY?

- Discontinuation of metformin and insulin aspart
  - Gliclazide (120 mg/day)
  - Insulin glargine (0.7 U/kg/day)

- High blood glucose measurements
- High HbA1c
- Insulin aspart

- NGS of MODY genes (GCK, HNF1A, HNF1B, HNF4A, KCNJ11, INS and ABCC8 genes)
  - c.1252 T>C heterozygous variant in the ABCC8 gene (previously defined)

**Conclusion**

Identification of a MODY subtype is crucial for the choice of adequate treatment. Molecular genetic analyses of MODY genes in patients with apparent type 2 DM, who have a strong family history of DM and on-going need for insulin treatment, may provide accurate diagnosis. Diabetic patients with mutations in ABCC8 are usually responsive to treatment with sulfonylurea. In these cases, transition from insulin to sulfonylurea therapy may allow better glycemic control and improvement in the quality of life.