First 4 cases of neonatal diabetes from Kazakhstan, Almaty with proven mutations in KCNJ11 and INS genes

Akmaral Nurbekova[1], Andrew Hattersley[2], Svetlana Ten[3], Amrit Bhangoo[4]

1 - Kazakh National Medical University, Almaty, Kazakhstan

2 - University of Exeter Medical School, Exeter, UK

3 – Lutheran Medical Center, Brooklyn, NY

4 - Children's Hospital of Orange County, Orange, CA

Introduction:

•We report 4 cases of neonatal diabetes from Almaty, Kazakhstan with the KCNJ11 gene mutation who were successfully switched from insulin to sulfonylurea treatment and 1 case of insulin (INS) gene mutation that presented as permanent insulin dependent neonatal diabetes

Case 1:

•An 1 month old girl presented with elevated glucose level, dehydation, ketoacidosis and was treated with Insulin. Hb A1c at diagnosis was 10%. Heterozygous missense mutation in the *KCNJ11* gene, exon 1, c.685G>A, p.Glu229Lys (p.E229K) was identified. At 18 months diabetes resolved. Mother has the same heterozygous missense mutation in the *KCNJ11* gene, exon 1, c.685G>A, p.Glu229Lys (p.E229K). She was treated with Glibenclamide, which has normalized her glucose levels.

Case 2:

•2 months old boy presented with elevated glucose level, dehydation, ketoacidosis and was treated with Insulin. Hb A1c at diagnosis was 11%. Heterozygous *de novo* missense mutation *KCNJ11* gene, exon 1, c.602G>A, p.Arg201 was identified. Both parents don't have this mutation. He was treated with Glibenclamide which has improved his glucose level.

Case 3:

• 3 months old boy presented with elevated glucose level, dehydration and was treated with Insulin. Hb A1c at diagnosis was 9%. Heterozygous *de novo* missense mutation *KCNJ11* gene, exon 1, p.Gly53Asp (p.G53D), DNA c.158G>A was identified. Both parents don't have this mutation. He was treated with Glibenclamide which has improved his glucose level.

Case 4:

•1 month old girl presented with elevated glucose level, dehydration and was treated with Insulin. HbA1c at diagnosis was 9%. Heterozygous mutation in *INS* gen c.64G>C p.A22P was identified. Both parents don't have this mutation. She continues to have insulin dependent diabetes

Conclusions:

•Genetic testing of neonatal diabetes can change treatment and prognosis. Heterozygous missense mutations uch as p.Glu229Lys, p.Arg201His, p.Gly53Asp in the *KCNJ11* gene can present as transient or permanent neonatal diabetes. Missense mutaiton p.A22P in the *INS* gene can present as permanent diabetes.

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•The testing of these patients was done by the University of Exeter laboratory, Exeter, UK (www.diabetesgenes.org).

•The Exeter team is happy to test any patients from any country in the world who are diagnosed in the first 9 months of life for neonatal diabetes genes.

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