Early-onset type 1 diabetes and multiorgan autoimmunity in a girl with partial monosomy 2q and trisomy 10p
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OBJECTIVES
Genes in the human leucocyte antigen (HLA) region confer about 50% of the genetic risk of T1DM. More than 40 different genes give a minor contribution to T1DM risk, some of them are related to the immune function.

Case presentation
• A girl was referred at the age of 9 months with severe ketoacidosis in T1DM at onset. Anti-islet cells and anti-insulin autoantibodies were negative at diagnosis, as well as screening for neonatal diabetes and methylation analysis for Prader-Willi syndrome. She was the only daughter of unrelated Caucasian parents, born at term by vaginal delivery. The father was affected by Crohn disease. She showed round face, prominent forehead, upslanting palpebral fissures, deep-set eyes, midface hypoplasia, and depressed nasal bridge. Mild mental retardation, hypotonia and eczema were evident. At the age of 3 years she developed juvenile idiopathic arthritis. Hypertriglyceridemia and anti-thyroidperoxidase, anti-thyroglobulin autoantibodies were first detected at the age of 16 years, but thyroid function remained normal over time. She manifested growth retardation and pubertal delay with low bone mineral density and 3 fractures from mild trauma. Spontaneous menarche occurred at the age of 17 years. Final height was 154 cm (-1.7 SDS), significantly lower than mid-parental height (cm 165, 0.2 SDS). Recurrent seizures first appeared at the age of 16 years.

RESULTS
CGH-array analysis: complex rearrangement involving chromosome 2q deletion and chromosome 10p duplication [2q37.3 (238.525.260-243.041.364) x1, 10p15.3p14 (148.206-6.633.649) x3]

CONCLUSIONS
Analysis of 2q and 10p regions revealed that PDCD1 (programmed cell death 1 precursor) gene is located on chromosome 2, IL-2RA (interleukin 2 receptor, alpha chain precursor/CD25) gene is located on chromosome 10. They are involved in the regulation of T cell function during immunity and tolerance. Their duplication or deletion could be responsible for changes in T regulatory cells affecting their ability to suppress effector T cell function, finally increasing susceptibility for autoimmune diseases. A previous paper (published on Feb 2013) described the same complex rearrangement in a patient affected by Turner syndrome, T1DM and Hashimoto’s thyroiditis.

References