Is there a relationship between Immune-mediated Type 1 Diabetes Mellitus and Congenital Rubella Infection?

Hüseyin Anıl Korkmaz [1] Çağatay Ermiş [2]
[1]Balıkesir Atatürk State Hospital, Division of of Pediatric Endocrinology, Balıkesir, Turkey.
[2]Dokuz Eylul University Hospital, Child and Adolescent Psychiatry Unit, Izmir, Turkey.

Introduction

Congenital rubella infection is a transplacental infection that may cause intrauterine growth retardation, cataract, patent ductus arteriosus, hearing loss, microcephaly, thrombocytopenia and severe fetal injury. Although the Rubella virus is known to infect pancreatic beta cells, the etiological role of this viral infection in the development of type 1 diabetes mellitus (DM) in humans is still unknown. It has been shown that type 1 DM develops in 12-20% of patients with congenital rubella infection and disorder in oral glucose tolerance test is observed in 40% of patients with congenital rubella infection.

13 years ♂

History: A 13-year-old male patient presented with complaints of new-onset polydipsia, urination, and weight loss. He lost 7 kilograms in 2 months. From 3 months old, he was diagnosed with patent ductus arteriosus in pediatric cardiology department and he was found to have neurosensory hearing loss from birth and there was no kinship between his parents. He had no response to voice warnings at 3 months age and his neurosensory hearing loss was diagnosed with auditory brainstem evoked responses test. In prenatal history, her mother had fever and red rash on her face during pregnancy in second trimester pregnancy. She was not diagnosed with rubella infection at this time. In the medical history, it was learned that the child was followed by the child and adolescent psychiatry department due to behavioral problems and learning disabilities. He was diagnosed with autistic spectrum disorder.

Physical examination: Weight: 42.7 kg (25-50p), Height: 153.2 cm (25-50 p), Head circumference: 46 cm (< 3p), 2/6 cardiac murmur and hearing aid were present.

Clinical Course: Blood glucose was 619 mg / dl, urine ketone was +3, blood gas shows metabolic acidosis (pH:6.92, HCO3:4 mEq/L, PaCO2:24 mmHg), insulin was 4,1 IU / mL (2-18) and serum C-peptide level was 1.23 ng / mL (1,1-4,4). HbA1c value was 15.9%, anti insulin antibody was 0.78 U / mL (0-0.5U), anti-GAD was 22.8 U / mL (< 1U / mL) and islet cell antibody was positive. Intravenous fluid and insulin therapy was started according to the degree of dehydration with the diagnosis of immune-mediated type 1 DM. Subcutaneous insulin therapy was switched to 1.2 units / kg / day after the patient's metabolic acidity was corrected and blood glucose regulation was achieved. Wolfram syndrome was excluded by evidences of no optic atrophy and optic nerve thickness was normal in orbita MR. The gene analysis carried out by considering Wolfram's syndrome was normal. Immune-mediated type 1 diabetes was thought to be associated with congenital rubella infection due to patent ductus arteriosus, microcephaly, and neurosensory hearing loss following a febrile and rash illness of the mother during pregnancy.

Conclusion

Patients with congenital rubella infection usually represent genetic and immunologic features including islet cell surface antibodies associated with type 1 DM. Congenital rubella infection should be considered when the diabetes patients present with hearing loss, cardiac anomalies and microcephaly.