# Latent Autoimmune Diabetes Challenging Case

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**Case Study**

A 39-year-old man presents with polyurea and polydipsia for the past 2 months. The patient had no known family history of diabetes but did have a personal history of Grave's disease which was treated with radioactive iodine. His only medication is levothyroxine. His blood pressure is 120/78 mmHg, and his BMI is 24 kg/m. His physical examination findings are unremarkable.

Laboratory tests revealed a plasma glucose of 232. TSH was found to be within normal limits. His lipid profile came as follows (LDL-cholesterol 105 mg/dl, triglyceride 124 mg/dl, and HDL cholesterol 50 mg/dl) Urine analysis is normal with no ketonuria. Basal C-peptide level was found to be within the normal range A blood test for anti-glutamic acid decarboxylase antibody (GADA) is negative.

We were reluctant to treat this patient as type 2 diabetes or to proceed with further investigations. Eventually, we ordered other islet cell antibodies including IA-2 and the islet-specific zinc transporter isoform 8 (ZnTBA) and they turned out to be positive so we diagnosed this patient as having latent autoimmune diabetes.

**Discussion**

This patient has many risk factors for latent autoimmune diabetes in adults (LADA), no features of metabolic syndrome, a history of an autoimmune disorder (Graves' disease), and a normal BMI. Patients with LADA can have a normal or increased BMI, but a high BMI is more typical of type 2 diabetes.

The most frequently positive islet cell antibody in patients with LADA is GADA. However, not all patients with LADA are GADA positive and may only be diagnosed by checking for other islet cell autoantibodies. This patient's clinical presentation makes LADA quite likely, and other diagnostic tests should be ordered even though GADA was not detected.

Patients with LADA have residual C-peptide levels typically within the expected reference range. Patients with type 2 diabetes have normal or high C-peptide levels when diagnosed. A normal C-peptide would not distinguish whether he has LADA or type 2 diabetes. A high C-peptide level would make LADA very unlikely, but the definitive diagnosis of LADA requires one or more positive islet cell autoantibodies.

LADA itself is a heterogeneous disease where some patients have high antibody titers, and low BMI, and progress to insulin therapy fairly rapidly. Others with low antibody titers and features of insulin resistance, such as a higher BMI, progress more slowly to requiring insulin. Early recognition of LADA is paramount so that

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appropriate strategies are employed to delay beta-cell destruction and reduce complications.

**Keywords**
Latent Autoimmune Diabetes in Adults (LADA), Grave's disease, C-peptide levels, Polydipsia, Metabolic syndrome, Zinc transporter isoform 8 (ZnT8A)

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