

Thème 4 – GLYCEMIE ET DIABETES

Rotavirus and type 1 diabetes

Question 1: Use the documents to explain the origins of type 1 diabetes.

Question 2: Why is vaccination against a rotavirus a big hope for type 1 diabetics?

Doc 1 : Type 1 diabetes and rotavirus

A recent decrease in the incidence of type 1 diabetes in Australian children may be linked to the introduction of a routine vaccine against rotavirus, according to a study published yesterday (January 22) in *JAMA Pediatrics*. Using observational data, researchers in Melbourne found that diabetes rates have been declining in infants since the vaccine's launch in Australia in 2007—a finding that dovetails¹ with previous research hinting that rotavirus infection is a risk factor for the autoimmune disorder.

Harrison, another researcher explains: “twenty years ago our team revealed an association between the appearance of immune markers of type 1 diabetes in children and rotavirus infection,” Harrison says in the statement. “Subsequent studies in laboratory models suggested rotavirus infection of pancreatic cells can trigger an immune attack against the insulin-producing cells—similar to what occurs in type 1 diabetes.”

Federico Martinon-Torres, a researcher at Hospital Clínico Universitario and Instituto de Investigacion Sanitaria de Santiago in Spain notes that the findings add to existing evidence of connections between viral infections and autoimmune disorders in general.

“Rotavirus have been associated with an increased incidence of celiac disease and type 1 diabetes,” he says. “Inflammatory response against rotavirus in early stages of immune maturation is associated with tolerance breakdown and immune dysregulation.”

<https://www.the-scientist.com>, January 23, 2019, Catherine Offord

Doc 2 : Autoimmune disorders.

In autoimmune disorders, the immune system attacks the body's healthy tissues as though they were foreign invaders. A severe attack can affect how that body part works.

The pancreas can't make insulin because the immune system attacks it and destroys the cells that produce insulin. Kids and teens with type 1 diabetes are at risk for other autoimmune problems, but these aren't caused by the diabetes.

Doctors still aren't exactly sure why autoimmune diseases happen. But genetics probably play an important role because relatives of people with type 1 diabetes are more likely to have autoimmune diseases.

Most kids with type 1 diabetes never need treatment for any other autoimmune disorder. But those who do might develop:

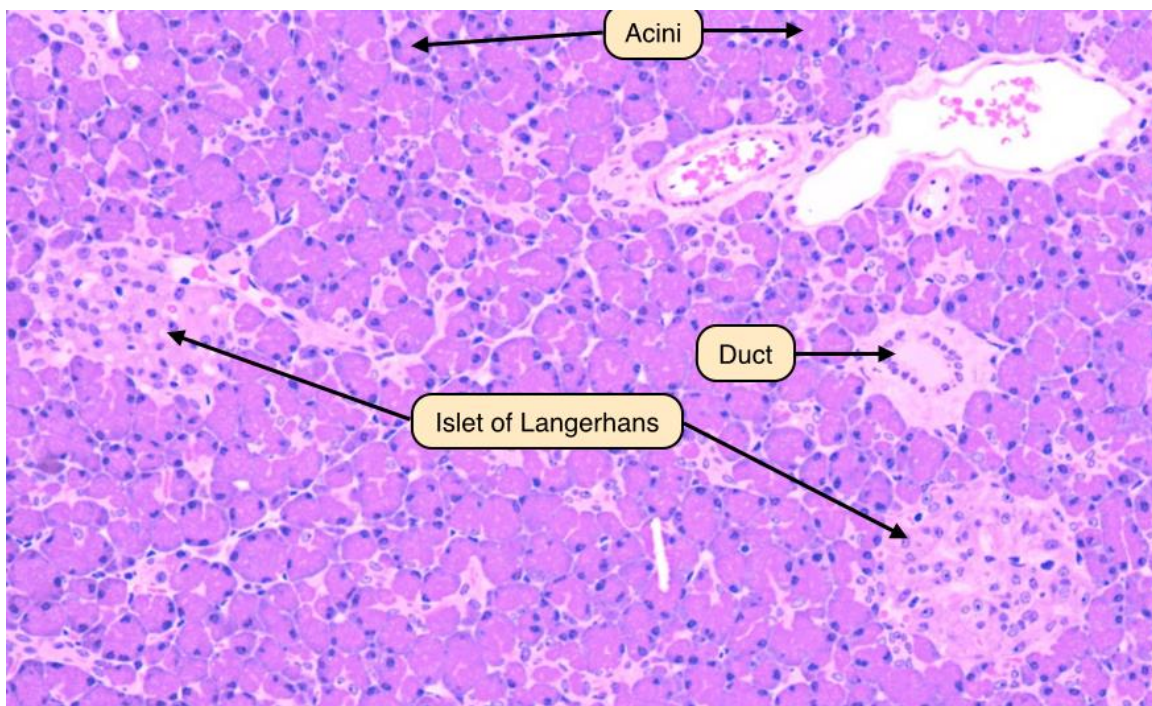
- thyroid disorders
- celiac disease
- Addison's disease

These disorders can develop before a child is diagnosed with type 1 diabetes or months or years after the diabetes diagnosis.

<https://kidshealth.org>

¹ dovetail: fit together with

Doc 3 : Pancreatic cells



The pancreas consists of two functionally distinct parts: an exocrine part that produces digestive secretions that are discharged into the duodenum via a system of ducts, and an endocrine part consisting of the islets of Langerhans, which secrete insulin and glucagon to regulate carbohydrate metabolism. The endocrine pancreas that secretes insulin and glucagon is more lightly stained² and its cells cluster to form the Islets of Langerhans. The cells of the exocrine pancreas form small clusters or acini.

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<http://medcell.med.yale.edu>

² stained: coloured