

Information about autoantibodies and the probability of developing type 1 diabetes

Autoantibodies associated with type 1 diabetes

Antibodies help to fight infection / disease and are part of the immune system. Sometimes antibodies target the body's own cells and destroy them. These are called autoantibodies.

In type 1 diabetes, the insulin-producing cells - beta cells - in the pancreas are damaged. For reasons we do not know, the body's immune system does not recognise the beta cells and destroys them.

As part of diabetes research, blood samples from children in MIDIA are tested for three different autoantibodies (anti-insulin, anti-GAD and anti-IA2). Testing positive for autoantibodies does not necessarily mean that the child has diabetes or will develop it, but that there is an increased risk of becoming ill in the future.

The blood samples are tested at the Hormone Laboratory at Oslo University Hospital, Aker. This laboratory participates in an international quality assurance program for the measurement of autoantibodies.

What is the probability of developing type 1 diabetes?

Boys and girls have roughly equal probability of developing type 1 diabetes. Among all the children in Norway, it is expected that about 5 out of 1000 children (0.5%) will develop type 1 diabetes before the age of 15.

It is difficult to determine the exact probability of developing type 1 diabetes. In general, there is a higher risk associated with repeated positive tests for two or three autoantibodies. When a child has repeated positive tests for two or three autoantibodies, this is called "pre-diabetes". The likelihood of developing type 1 diabetes within the next 3-5 years for children with "pre-diabetes" is estimated to be about 40-50%. However, the variation is considerable.

The number of autoantibodies can rise, fall, or disappear altogether without our knowing exactly why. False positive tests can also occur (measurement error). Some children may go for years without developing type 1 diabetes, while a few can get the disease after only a few weeks. Some children may also develop type 1 diabetes without having autoantibodies, or they may only have one autoantibody.

By January 2013, 40 children in MIDIA had developed "pre-diabetes" since they were followed up from 3 months of age and a total of 26 children had developed type 1 diabetes.

How many children have type 1 diabetes in Norway?

More than 2000 children under 15 years are living with type 1 diabetes in Norway today, and each year there are between 300 and 350 new cases of children. Those with type 1 diabetes need insulin by syringe or pump to regulate blood sugar levels.

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When does type 1 diabetes start?

Type 1 diabetes can occur at any age, even in adults. Most commonly, type 1 diabetes begins from 5-15 years of age, especially around puberty. Children who have "pre-diabetes" at an early age (usually before 4.2 years of age) tend to develop type 1 diabetes earlier than others.

Genes and family history of diabetes

Of all new cases of type 1 diabetes among children, most do not have a close relative with the disease. However, having type 1 diabetes in the family is still associated with an increased likelihood of developing the disease.

Regardless of whether or not there is diabetes in the family, there are different genes that predispose to type 1 diabetes to varying degrees. Most children who get type 1 diabetes have at least one additional gene combination that predisposes to disease. There are many who have these genes without becoming ill. The MIDIA research project is trying to figure out why some become ill and others do not.

What should parents look out for?

Parents of children who have developed "pre-diabetes" should be alert to symptoms such as frequent urination, unusual thirst, weakness (or general malaise) and weight loss. These symptoms appear quickly when starting to develop the disease and blood glucose levels should be measured by a doctor to confirm or rule out whether the child has type 1 diabetes. It is important to remember that the child can be healthy for several years before eventually developing type 1 diabetes, even if the child has "pre-diabetes". Unfortunately, there is currently nothing we can do to slow the progression of diabetes so MIDIA will continue to identify environmental causes that contribute to the development of type 1 diabetes.