

Immunisation and diabetes

The human body needs blood glucose (sugar) for energy. Blood glucose levels are regulated by the hormone insulin, which is made by the pancreas. Diabetes is a condition characterised by high blood glucose levels. Type 1 diabetes, or insulin dependent diabetes mellitus (IDDM), is caused by an autoimmune destruction of insulin-making cells in the pancreas. It is one of the most common childhood diseases in developed nations.

Some researchers have speculated that IDDM may be linked with certain vaccinations such as measles-mumps-rubella (MMR), *Haemophilus influenzae* type b (Hib), and the pertussis (whooping cough) component of diphtheria, tetanus, pertussis (DTP). This theory has caused widespread concern in the medical community and panic among some parents. However, further studies undertaken around the world have found no evidence that vaccinations can cause or influence the development of diabetes.

The diabetes theory

The researchers, such as Dr Classen, proposed that some childhood vaccinations may trigger an abnormal immune system response in vulnerable children, ultimately causing the body to attack and destroy the insulin-making cells of the pancreas. Trials showed that giving animals (such as mice) certain vaccines could either increase or decrease their risk of developing diabetes, depending on the age of the animal when the vaccinations were given.

Problems with the methodology

Commentators point out that the Classen experiments used the anthrax vaccine, which is hardly ever administered to humans. Animals and humans are very different in biology, which means something that affects an animal may not affect a human, and vice versa.

Dr Classen's theory that vaccinations can cause diabetes was further based on the fact that diabetes type 1 is common in Western nations where immunisation is widespread, but relatively uncommon in developing nations where immunisation rates are low. Critics argue that this reasoning is flawed because it doesn't take into account any other genetic or environmental factors.

Other studies have failed to find a link

Researchers around the world who have investigated the issue have found no evidence that supports the theory linking immunisation and diabetes. Graves (1999) and coworkers prospectively studied children from families with a member with type 1 diabetes. They looked for the development of autoimmunity to the insulin-producing cells of the pancreas. No association was found between such autoimmunity and being vaccinated – this includes hepatitis B, Hib, polio, or diphtheria and tetanus toxoids and pertussis (whooping cough).

Later, a large population-based case-control study (De Stefano, from the Centers for Disease Control and Prevention, and others), published in *Pediatrics* (December 2001), found no increased risk of type 1 diabetes associated with any of the routinely recommended childhood vaccines. However, there is concern that parents may choose not to have their children vaccinated. If vaccination levels fall too low, disease epidemics may flourish.

No need to alter vaccination schedules

There have been suggestions that babies should receive their vaccinations later in life to reduce the 'risk' of adverse reactions such as diabetes. However, the proposed link between diabetes and childhood immunisation has been investigated by researchers worldwide and refuted. There is no need to alter current immunisation schedules. Delaying vaccination is dangerous because it leaves young children vulnerable to catching serious diseases.

In fact children with diabetes are strongly recommended to receive additional vaccines such as annual influenza vaccine and an extra two doses of pneumococcal vaccine at 12 months and four to five years of age. These vaccines protect against viruses and bacteria that can cause severe complications that may result in hospitalisation.

Immunisation and HALO

The immunisations you may need are decided by your health, age, lifestyle and occupation. Together, these factors are referred to as HALO.

Possible triggers of diabetes under investigation

The exact cause of type 1 diabetes mellitus is unknown, but a range of genetic and environmental factors is thought to contribute. Current factors under investigation include:

- **Infection** – the incidence of diabetes seems linked to the seasons, with increased rates in late autumn and early winter. This suggests to some researchers that the development of diabetes may include a viral component.
- **Milk** – some studies have found that breastfed babies have a reduced risk of diabetes, while babies fed cows milk may have an increased risk.
- **Nitrates** – some studies have shown that drinking water containing high amounts of nitrates is a risk factor.

Where to get help

- Your doctor
- Immunisation program, Department of Health Victoria Tel. 1300 882 008
- Diabetes Australia Victoria Tel. 13 RISK (13 7475)
- Baker IDI Heart and Diabetes Institute Tel. (03) 8532 1111
- Juvenile Diabetes Research Foundation Tel. (03) 9696 3866
- National Immunisation Infoline Tel. 1800 671 811

Things to remember

- Type 1 diabetes, or insulin dependent diabetes mellitus (IDDM), is caused by an autoimmune destruction of insulin-making cells in the pancreas.
- Studies undertaken around the world have found no evidence that childhood vaccinations can cause or influence the development of diabetes.

This page has been produced in consultation with, and approved by:

Department of Health - Communicable Disease Prevention and Control Unit

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