

# Self-destruct

## Vaccines to prevent a Third World killer may trigger diabetes

**INFECTION** with a rotavirus, the commonest cause of gastro-enteritis in children, may lead to childhood diabetes. Although this suggests that rotavirus vaccines could help prevent diabetes, it also raises fears that the vaccines themselves could trigger the disease.

Australian researchers discovered the link after a six-year study of 54 babies. "It's the most important piece of work I've heard of in a long time," says diabetes researcher Glenys Thomson at the University of Berkeley in California. "The evidence so far is looking very good."

Unlike type II diabetes (see [p 10](#)), which usually affects people in middle age, type I diabetes is an autoimmune disease that tends to start early in life, and genetic susceptibility is an important factor. The disease develops when the immune system attacks cells in the pancreas that produce insulin, which means that the body can't control its blood sugar levels properly.

Two years ago, Margo Honeyman of the Walter and Eliza Hall Institute of Medical Research in Melbourne reported a possible link between diabetes and rotaviruses. She had noticed that parts of some rotavirus proteins are similar to parts of proteins on the pancreatic cells that trigger the destructive immune response (**Nature Biotechnology**, vol 16, p 966).

To investigate further, Honeyman's team monitored the progress of 54 babies for up to six years. All had a parent or sibling with type I diabetes and so were at risk of developing the disease.

As expected, all the children became infected with rotaviruses during the study. In the 24 children who showed clear signs that they were developing diabetes, levels of antibodies in their blood that signal an attack on the pancreas went up almost every time they got a rotavirus infection. The antibodies then dropped until the next infection. Children who didn't develop diabetes showed no signs of their pancreas being attacked following a rotavirus infection. Neither did the rotavirus trigger an increase in antibodies against any other organs.

How the virus might trigger diabetes isn't yet clear. It may damage cells in the pancreas directly when it infects them. Alternatively, it might mimic the pancreatic proteins that incite the immune system to attack.

If mimicry is the answer, it could spell trouble for some of the rotavirus vaccines being developed. The hope is that these vaccines will save the lives of thousands of children in poor countries who die from gastro-enteritis each year. But the tamed virus in some vaccines might also trigger diabetes in susceptible children.

"If rotavirus is directly infecting the pancreas then a vaccine will be safe and protective," says Honeyman. "But if it's mimicry alone, or both infection and mimicry, the vaccines may be dangerous."

"It's fairly convincing evidence that rotavirus might be one of the triggers for juvenile onset diabetes," comments virologist David Cubitt of the Great Ormond Street Hospital in London. "The idea of molecular mimicry is extremely interesting, but obviously lots of other bits of the puzzle need to be put in."

Honeyman's team is hoping to fill in some of the gaps. By trying to infect mouse pancreatic cells in culture, they hope to confirm whether, and how, rotavirus damages the pancreas. Honeyman has not excluded the possibility that other viruses are involved. Coxsackie B, for example, is a prime suspect.

Rachel Nowak

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