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# Bacteria link to baby's health

Breakthrough for pregnant women with diabetes

**EXCLUSIVE**  
**BRIGID O'CONNELL**

**BOOSTING** the amount of good bacteria in the guts of pregnant women with type 1 diabetes could reduce their higher rate of pregnancy complications, as well as giving their babies a healthier start to life.

Being born to a mum with a gut microbiome rich in anti-inflammatory bacteria could help "prime" the baby's immune system and prevent them going on to develop the lifelong auto-immune condition themselves.

That is the theory about to be tested by a team of researchers led by the Walter and Eliza Hall Institute of Medical Research, after uncovering key differences in the constellation of gut bacteria in pregnant women with type 1 diabetes.

Lead researcher Professor Len Harrison said women with type 1 diabetes had a ten-fold increased risk of developing pre-eclampsia the potentially life-threatening high-blood pressure condition of pregnancy – as well as having a premature baby, regardless of how well their diabetes was controlled.

Emily Burkimsher and her two young boys, Cary (two) and Austin (eight months), New research led by the Walter and Eliza Hall Institute has found that pregnant women with type 1 diabetes have a different make-up of gut bacteria, which may cause their higher rate of pregnancy complications. Picture: Rob Leeson.

"The gut microbiome is known to be critical to health, and it regulates inflammation," Prof Harrison said.

"Pre-eclampsia is known to be an inflammatory state. We thought, if we could restore the gut microbiome to a healthy state, would this reduce the risk of pregnancy complications, not just in women with type 1 diabetes?"

The findings are part of the Environmental Determinants of Islet Auto-immunity study, which has recruited 1500 Australian babies who have a parent or sibling with type 1 diabetes. They will be followed through childhood to find out what environmental factors have caused the type 1 diabetes prevalence to double in 20 years.

The researchers genetically analysed faecal samples from 66 women – half with type 1 diabetes – and found the gut microbiome changed from the start to the end of pregnancy in every mother.

But women with type 1 diabetes were lacking in the types of helpful bacteria that prevent inflammation, as well as having more inflammation-causing bacteria.

These women were also found to have damage to the gut wall, which could let harmful bacteria escape into the bloodstream.

The study was published in the journal *Microbiome*.

"This led me to thinking about whether the mother in pregnancy could influence the immune system of the

baby before birth. And whether, if she was leaking substances that cause inflammation into her bloodstream, whether they would stimulate not only her inflammation but activation of the immune system in the baby before birth," Prof Harrison said.

The team has been funded by New York's Helmsley Charitable Trust to investigate this theory by looking at the immune function of the baby's cord blood and their health up to age one.

"What I think is possible is if the mother conditions the immune system of the infant pre-birth, then the infant might be more likely to avoid infections in the first year of life," he said.

"It might therefore avoid

infections that could trigger type 1 diabetes."

In the second stage, the ENDIA team is planning a clinical trial to test whether diet modification or taking supplements in pregnancy can reduce inflammation.

Emily Burkimsher was diagnosed with type 1 diabetes at age two, and while she used good diabetes control to have healthy pregnancies, her sons were born two months early.

"There is an elevated risk of passing diabetes on, so to think you could give women a supplement to prevent diabetes in their children – that's wow," she said.

"My dream is my boys don't have to go through what I've been through."

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