

Why we did this research:

Continuing on from our previous work investigating the population of gut viruses (the “virome”) present in ENDIA mothers during pregnancy, we next examined how the gut virome changes over time during the first year of life in healthy ENDIA infants. Knowing what viruses are present and how they change in early development is critical to determine which viruses can significantly impact infant health and the risk of developing type 1 diabetes (T1D).

What we found:

In total, we examined the gut virome of 25 healthy infants participating in the ENDIA study, 11 with a mother with T1D. We found that viruses are prevalent in the gut of infants during the first year of life and greater number of viruses were observed compared to previous studies. Infants with a mother with T1D were more likely to have viruses in the gut compared to those without (75% vs 59%) and a large number of viruses were found to differ significantly in abundance between these two infant groups. Among the most different were human bocavirus and rotavirus A, which were more abundant in the infants with a mother with T1D. We found no significant associations between infant gut virome and the mode of birth, antibiotic usage and breastfeeding.

How does this add to existing knowledge?

We demonstrated differences in the gut viruses present in infants of mothers with type 1 diabetes. This may influence health outcomes later in life. Higher prevalence, and greater number, of viruses observed compared to previous studies was most likely due to more sensitive techniques used for virus detection in ENDIA.

What does this mean for ENDIA families and the wider type 1 diabetes community?

Now that we have a good insight into what viruses are usually present in healthy infants during early life, we are ready to compare this “normal” gut virome to that of infants who develop T1D. Furthermore, the availability of corresponding maternal pregnancy samples allows future investigation of whether any viruses detected in the present study were potentially passed on from mother-to-infant before birth. Once we determine the viral “culprits” that contribute most significantly to the development of T1D, we may be able to develop vaccines or antivirals to prevent the condition in the future.