

Bacteria And Babies: A Scientific Debate - Part Two



By Julianna LeMieux — February 26, 2017



For the last decade or two, people have been looking for something to attribute to the increase in the number of people with allergies and autoimmune diseases. A lot of ideas have been floated around - cell phones, vaccines, hand sanitizers or anything else that we use more now than we did 20 years ago.

On that list is also the increase of births done by Cesarean section.

The hypothesis is that babies born by Cesarean have a different microbiome (or set of bacteria) on them than those born vaginally. And, that those bacteria that are first to establish themselves in the newborn impact the health of the baby for the rest of their life.

The idea that has taken hold is that babies born by Cesarean section are missing exposure to important microbes because they do not pass through their mother's birth canal. This idea has been around for about a decade, but, was solidified by the work of Dominguez-Bello et al. with a study that analyzed the bacteria of nine mothers and their babies. We described that work in [an article published last week](#) [1].

A new [paper](#) [2] published last month in *Nature Medicine* turns this idea on its head, with results that suggest that the route of delivery may not be as important as we thought to setting up the microbiota.

The study had 60 pairs of mothers and newborns whose bacteria were sampled both at delivery and at 6 weeks post-delivery. They chose that time point because the baby is not yet in a setting where it is being exposed to many different sources of microbes (ie. is not in daycare or crawling on the floor.) The population of mothers was relatively homogenous - mostly Hispanic women whose infants were born at term.

The bacterial samples were taken from multiple areas of both the mothers and infants including

their stool, oral, nares (nose), skin and vagina.

First, the study found that the bacteria found on the bodies of the newborns at birth, regardless of location of sampling, was incredibly similar. Meaning that the bacterial communities found in the nose were not that different from the bacteria found in any other body part.

Also, the bacteria that are commonly found in the mother's vagina and skin (*Lactobacillus*, *Propionibacterium*, *Streptococcus* and *Staphylococcus*) were the most commonly found bacteria in the babies at the time of delivery - across all sampling sites - and the vagina and skin seem to contribute equally to the types of bacteria transferred.

Interestingly, the same distribution of bacteria received from the skin and vagina was seen in babies delivered vaginally and through a labored C section - but not in an unlabored C section. In an unlabored C section, most of the bacteria on the baby matched the bacteria found on the mother's skin.

Therefore, a more important factor in the transfer of microbiota from mother to baby may not be whether the baby was delivered vaginally or by C section, but whether the mother labored or not.

In the end, however, the mode of delivery or even whether the mother labored or not may not matter much because at 6 weeks old, the bacterial communities on the infants had changed substantially and were found to be representative of where they were found on the body - not by how the baby was delivered. So, the bacteria in the babies' nose were there because they were in the nose - not because the baby was born vaginally or via C section.

Any interesting differences or patterns that were influenced by the mode of delivery were gone by the 6 week mark.

As we said in part one of this two-part series, this is a great scientific debate with no clear answer. And, with C-sections making up about 30% of births in this country and the importance of the microbiota being continuously revealed, you can be sure that this is not the last word on this topic.

Reference:

Chu DM, Ma J, Prince AL, Antony KM, Seferovic MD, Aagaard KM Maturation of the infant microbiome community structure and function across multiple body sites and in relation to mode of delivery. [Nat Med.](#) [3] 2017 Jan 23. (epub ahead of print.)

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