

# Narrower range of helpful bacteria in guts of C-section infants

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The range of helpful bacteria in the guts of infants delivered by caesarean section, during their first two years of life, is narrower than that of infants delivered vaginally, indicates a small study published online in the journal *Gut*.

This has implications for the development of the immune system, say the researchers, particularly as the C-section infants had lower levels of the major group of [gut bacteria](#) associated with good gut health, Bacteroidetes phylum, as well as chemicals that help curb allergic responses.

The researchers assessed the patterns of bacterial colonisation of the guts of 24 infants, nine of whom had been born by caesarean section one week, and then again at one, three, six, 12 and 24 months after birth.

They also took [blood samples](#) at six, 12 and 24 months to test for levels of immune system chemicals known as Th1 and 2 associated chemokines. Excess Th2 chemokines have been implicated in the development of allergies, which Th1 responses can counteract, say the authors.

The results showed that babies delivered by [caesarean section](#), and who therefore did not pass down the mother's [birth canal](#), either lacked or acquired late one of the major groups of gut bacteria, the Bacteroidetes, compared with the babies born vaginally.

In some C-section infants acquisition of Bacteroidetes did not occur until a year after birth. The total range of bacteria among those born by C-section was also lower than that of their vaginally delivered peers.

The differences in bacterial colonisation between the two groups of infants were not down to their mums having been given antibiotics during C-section or after the procedure to prevent infection: the levels and range of bacteria sampled from both sets of mums were similar, the analysis showed.

Bacteria are important for priming the immune system to respond appropriately to triggers, and not overreact as is the case in allergies, diabetes, and [inflammatory bowel disease](#), say the authors.

This includes the development of immune system T cells and the correct balance between their chemical messengers, Th1 and Th2.

The C-section infants had lower circulating levels of Th1 chemical messengers in their blood, indicating an imbalance between Th1 and Th2. "Failure of Th2 silencing during maturation of the immune system may underlie development of Th2-mediated allergic disease," write the authors.

They point out that previous research has indicated that *Bacteroides fragilis*, one of the many Bacteroidetes, strongly influences the immune system, which ultimately enhances T cell activity and the Th1-Th2 balance.

"Thus, the lower abundance of *Bacteroides* among the C-section infants may be a contributing factor to the observed differences in the Th1-associated chemokines," they write.

**More information:** Decreased gut microbiota diversity delayed

Bacteroidetes colonisation and reduced Th1 responses in infants delivered by Caesarean section, Online First, [DOI: 10.1136/gutjnl-2012-303249](https://doi.org/10.1136/gutjnl-2012-303249)

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