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DO MILK MICROBES SEED THE INFANT GUT? INFLUENCE OF BREASTFEEDING METHOD AND DURATION ON BACTERIA SHARED BETWEEN BREASTMILK AND INFANT FECES

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Background:

Breastmilk contains bacteria thought to colonize the infant gut. However, supporting evidence is limited and impacts of breastfeeding method and duration are unknown.

Objective:

To identify bacterial taxa shared between breastmilk and infant feces, and assess whether breastfeeding method and duration altered how many were shared.

Methods:

We studied a subset of 282 breastfed infants in the CHILD Cohort Study. Microbiota composition was analysed by Illumina 16S rRNA gene V4 sequencing in breastmilk at 3 months (mean 42 amplicon sequencing variants (ASVs) per sample), and infant feces at 3 months (mean 24 ASVs) and 1 year (mean 36 ASVs). The χ^2 test was used to compare the number of shared ASVs between those receiving any vs. no pumped breastmilk at 3 months, and between those receiving any vs. no breastmilk at 1 year. Redundancy analysis was applied to measure the effect of shared bacteria on observed variation in infant gut microbiota composition.

Results:

A median of 3 ASVs were shared between milk and feces at 3 months (range: 0-16) and 1 year (range: 0-9). Most commonly shared ASVs, *Streptococcus* sp. and *Veillonella dispar*, were shared in 61% and 36% of dyads, respectively. At 3 months, infants exclusively fed at the breast had more shared ASVs than those receiving some pumped milk (79% vs. 63% had ≥ 3 shared ASVs; $p=0.014$). Likewise, infants at 1 year who were still receiving breastmilk had more shared ASVs than those who were not (69% vs. 44% had ≥ 3 shared ASVs, $p<0.001$). At 3 months, shared ASVs from breastmilk explained 1.27% of observed variation in fecal microbiota composition, which was comparable to variation explained by birth mode (1.02%).

Conclusion:

Although few ASVs were shared between breastmilk and infant feces, our results support the hypothesis that some milk bacteria colonize the infant gut, and suggest that pumping may alter this process.