

Abstract

Human Milk Microbiome Is Altered in Mothers with Gestational Diabetes Mellitus[†]

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Gestational diabetes mellitus (GDM) is a metabolic disease of pregnancy that is associated with alterations in the maternal and infant gut microbiota. The intake of human milk shapes the infant gut microbiome; however, to date, only one small study has investigated the impact of GDM on the milk microbiome. Therefore, we aimed to add more robust data to this field by characterising the human milk microbiome of mothers with GDM and without GDM over the first 6 weeks postpartum. Given the relationships between body mass index (BMI) and milk production with GDM, our secondary aims examined relationships between maternal BMI, milk production and the milk microbiome. Eighty-three mothers were included in the analysis (forty-three with GDM and forty without GDM). Participants measured their milk production at 3 weeks postpartum by test weighing their infants before and after each feed over 24 h and supplied milk samples at 1, 3 and 6 weeks postpartum. Full-length 16S rRNA gene sequencing was performed. Milk from mothers with GDM had a higher alpha diversity than milk from mothers without GDM (richness, $p = 0.026$; Shannon diversity, $p = 0.044$). Beta diversity differed between the two groups (PERMANOVA, $p = 0.034$). At the OTU level, the composition of the milk microbiome varied significantly based on GDM status and maternal pre-pregnancy BMI. Mothers with GDM were more likely to have low milk production (<600 g/24 h; $p = 0.018$). However, the milk microbiome was not associated with milk production. This study contributes further to our understanding of differential microbiome outcomes in relation to GDM.



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