Breastmilk output is negatively related to maternal pre-pregnancy BMI and pregnancy glycemia in nondiabetic, exclusively breastfeeding women

Background: Obese women are less likely to initiate breastfeeding and experience shorter breastfeeding duration than normal weight women, but the mechanisms that are responsible for this phenomenon are not well established. Obese women frequently report insufficient milk production as the reason for cessation of breastfeeding, but few studies exist that track milk output prospectively in obese versus normal weight women to assess when and how milk supply may be compromised in obese women.

Objective: To test the association of pre-pregnancy BMI, gestational weight gain, and pregnancy glycemia as predictors of breastmilk output in exclusively breastfeeding women. Design/Methods: Subjects included exclusively breastfeeding, non-diabetic, non-smoking mothers and their term, AGA, singleton infants (N=206 dyads), enrolled in the ongoing MILK cohort study. Milk output was measured to the nearest gram at 1 and 3 months post-partum as the difference in infant weight from before to immediately after a single test feeding between 7:30 and 10:30 am. Maternal pre-pregnancy BMI, gestational weight gain (GWG) and oral glucose challenge (50g) test results (OGC) at 24-28 weeks gestation were obtained from the electronic health record and examined as predictors of milk output in three separate models. Least-squares means for milk output were compared across pre-pregnancy BMI groups (normal weight, overweight, and obese), adjusting for maternal age, parity, gestational weight gain, infant gestational age at birth, sex, and birth weight. GWG and OGC were treated as continuous variables in similar linear regression models. Results: The women had a mean BMI of 26.3 kg/m² (range 18.9 - 35.6 kg/m²), mean OGC value of 103.9 mg/dl (range 51-140), and mean milk output was 68 g at both timepoints. There was a negative, dose-response association between milk output and pre-pregnancy BMI at 1 month (p=0.015) (Fig 1) while at 3 months the stronger predictor of lower milk output was higher OGC (p=0.0008) (Fig 2). Milk output was not significantly associated with GWG. Conclusion(s): The present study suggests a dose-response decline in milk output as maternal pre-pregnancy BMI increases. The finding is supported by a similar and (at 3 months) stronger negative association with pregnancy glucose tolerance. These findings, if replicated, could help to guide appropriate lactation support for obese women to increase milk supply, even among those who are initially successful in exclusively breastfeeding their infants.
Figure 1. Milk output (g) at 1 month post-partum by maternal BMI, covariate adjusted (p=0.015), N=206
Figure 2. Milk output (g) at 3 months post-partum by pregnancy oral glucose challenge test results (mg/dl), p=0.0008 (N=175)