



In conclusion, Dr. Leelarathna stated these data suggest that day and night closed-loop glucose control is feasible to perform at home and may result in improved glucose control. Next, they will compare a closed-loop system and optimized sensor-augmented pump therapy in 30 patients at home for day and night control.

## BF Reduces Risk of Diabetes After Gestational Diabetes

Written by Emma Hitt Nichols, PhD

Intensive breastfeeding (BF) decreased the risk of developing diabetes for women within 2 years after experiencing gestational diabetes mellitus (GDM) compared with exclusive formula feeding (FF). Erica P. Gunderson, PhD, MS, MPH, Senior Research Scientist, Kaiser Permanente, Oakland, California, USA, presented these data from the Study of Women, Infant Feeding and Type 2 Diabetes After GDM Pregnancy study [SWIFT; R01 HD050625, Gunderson PI].

The few studies of outcomes of BF after GDM pregnancy have reported conflicting results, likely because of reverse causation or residual confounding, such as recall bias, the influences of other healthy lifestyle behaviors closely related to lactation, differences in GDM severity and treatment, and adverse perinatal outcomes that may determine lactation success. The purpose of the SWIFT study was to evaluate the effect of lactation on the progression to diabetes in women with a recent GDM pregnancy. The study was designed to evaluate and control for potential sources of reverse causation or residual confounding.

In the multicenter, prospective, observational study of 1035 women with GDM enrolled between 2008 and 2011, participants consented to 3 in-person exams within 2 years that included 2-hour 75-g oral glucose tolerance tests (OGTTs), received 10 monthly mailings throughout the first year, and participated in 3 telephone interviews (at > 32 weeks gestation, and at 1 and 6 months postpartum). Women aged 20 to 45 years were eligible if they had a singleton, live birth at ≥ 35 weeks of gestation; were free of diabetes at 6 to 9 weeks postpartum; did not have pre-existing diabetes; were not planning another pregnancy within 2 years; and were either intensively BF or FF at enrollment. The study population was racially and ethnically diverse; 24% were white, 31% Hispanic, 8% black, and 36% Asian.

The primary outcome was incident diabetes as measured by a 2-hour, 75-g OGTT. Lactation measures were quantitative and included intensity at baseline, which was 6 to 9 weeks postpartum, and subsequent monthly assessments of intensity and duration of BF and FF

during the 2-year follow-up. Covariates included prenatal clinical outcomes, maternal and infant perinatal outcomes, and anthropometric measures, sociodemographics, and postpartum lifestyle behaviors.

The study classified women into four infant-feeding-intensity groups at 6 to 9 weeks postpartum: exclusive BF, mostly BF (< 6 oz formula per day), high FF (> 17 oz per day with some breast milk), and exclusive FF. There was no significant difference in prenatal 100-g OGTT results for women by BF or FF-intensity groups. Intensive BF (mostly or exclusive) was reported by 72%, 67%, and 54% of women at 1, 2, and 4 months postpartum, respectively. In addition, there were no significant differences in family history of diabetes, GDM treatment, gestational age, or prenatal 3-hour OGTT z-score among the breastfeeding intensity groups or the breastfeeding duration groups (0 to 2 months, 2 to < 6 months, 6 to 14 months, and > 14 months).

Compared with women who exclusively formula feed, the risk of developing diabetes within 2 years after delivery was lower with increasing BF intensity at 6 to 9 weeks postpartum, starting with high FF and some breast milk (HR, 0.61; 95% CI, 0.34 to 1.08), mostly breastfeeding (HR, 0.66; 95% CI, 0.41 to 1.07), to the lowest risk for the exclusively breastfeeding group (HR, 0.39; 95% CI, 0.22 to 0.77), after adjustment for race and ethnicity, prepregnancy body mass index, prenatal 3-hour OGTT z-score, and GDM treatment (trend  $p = .04$ ). Lower risk of incident diabetes within 2 years postpartum was also associated with increasing duration of BF, with greatest benefit experienced by women who breastfed for > 14 months compared with women who breastfed for 0 to 2 months in the fully adjusted model ( $p = .045$ ; Table 1).

Table 1. Effect of Duration of Breastfeeding on Diabetes Incidence Within 2 Years After Gestational Diabetes

Models	0 to 2 Months n = 193	> 2 to < 6 Months n = 210	6 to 14 Months n = 376	> 14 Months n = 181	p Value
Unadjusted	1.00	0.78	0.57	0.40	0.02
Adjusted <sup>a</sup>	1.00	0.86	0.70	0.47	0.13
Fully adjusted <sup>b</sup>	1.00	0.75	0.59	0.42	0.045

BMI=body mass index; GDM=gestational diabetes mellitus; OGTT=oral glucose tolerance test.

<sup>a</sup>Adjusted for prepregnancy BMI; <sup>b</sup>fully adjusted for prepregnancy BMI, prenatal 3-hour OGTT z-score, and GDM treatment.

The risk of developing diabetes after GDM was reduced with a longer duration of intensive BF in the SWIFT study.