

412 Cloud-based glucose monitoring for pregnancies with diabetes: Implications of testing adherence to perinatal complications



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OBJECTIVE: Validated reports of patient adherence to self-glucose monitoring and associated perinatal outcomes are limited. Using cloud based self-glucose monitoring technology, we asked the following questions:

1. Are there differences in rates of testing adherence based on type of diabetes in pregnancy?
2. Is adherence to glucose monitoring recommendations associated with perinatal outcomes in pregnancies complicated by diabetes?

STUDY DESIGN: This prospective, single-center, cohort study included women with type 2 diabetes (T2DM) and gestational diabetes (GDM) enrolled in a perinatal diabetes program before 29 weeks gestation between December 2015 and June 2018. All women received a cellular-enabled glucometer that uploaded glucose values to a cloud-based, HIPAA compliant platform in real time. Four glucose checks were advised daily and percent adherence was calculated. The study was powered for the primary outcome of adherence to advised self-glucose monitoring by diabetes type and large for gestational age (LGA) fetuses. Secondary outcomes were preeclampsia, cesarean delivery (CD) and neonatal hypoglycemia.

RESULTS: 102 eligible women were included in the study. Baseline characteristics differed between groups with women with T2DM having higher HgbA1c and BMI when compared to women with GDM. No differences were noted in age or parity. Adherence was calculated over 20±6 weeks for women with T2DM compared to 9±4 weeks for women with GDM. Overall adherence to glucose monitoring was significantly less for women with T2DM compared to those with GDM. Testing adherence rates were 51%, 66% and 70% for T2DM, GDMA1 and GDMA2 respectively ($p=0.016$).

Using logistic regression, the odds of CD, neonatal hypoglycemia and LGA fetuses decreased by 15-20% for every for every 10% increase in adherence (Table 1). There was no association between adherence and rates of preeclampsia.

CONCLUSION: Using a cellular-enabled and cloud-based glucometer that ensures accurate reporting of testing adherence, this study shows that overall adherence to testing recommendations differs by diabetes type and is associated with neonatal outcomes. Improved outcomes with higher adherence may reflect more timely medication adjustments in response to real-time glucose values. Programs aimed at improving adherence could prove beneficial.

	Uncontrolled OR* (95% CI)	p
Maternal outcome		
Cesarean Delivery	0.793 (0.687 – 0.916)	0.002
Preeclampsia	0.959 (0.812 – 1.133)	0.622
Neonatal Outcome		
Hypoglycemia	0.851 (0.739 -0.980)	0.025
Large for gestational age	0.818 (0.689 – 0.970)	0.025

*Odds ratios calculated for every 10 % increase in adherence.

413 Prevalence of shoulder dystocia by maternal body composition and diabetes status



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OBJECTIVE: We sought to examine the association between body mass index (BMI) and shoulder dystocia in women with pre-existing diabetes, with gestational diabetes, and without diabetes.

STUDY DESIGN: This is a retrospective cohort study of women with singleton, non-anomalous, term pregnancies between 2007 and 2011 using linked vital statistics and ICD-9 data. Chi-square tests were used to compare rates of shoulder dystocia in diabetic and non-diabetic women categorized by BMI class. Pre-pregnancy BMI was categorized into underweight (<18.5 kg/m²), normal weight (18.5-24.9 kg/m²), overweight (25-29.9 kg/m²), obesity I (30-34.9 kg/m²), obesity II (35.39.9 kg/m²), morbid obesity (40-49 kg/m²) and super obesity (>50 kg/m²). Multivariable logistic regression was used to estimate adjusted odds ratio (aOR) of shoulder dystocia by BMI class and by diabetes classification, controlling for maternal height, race/ethnicity, age, education, insurance status, and prenatal care.

RESULTS: The cohort of 1,384,790 consisted of 232,925 (16.8%) obese pregnant women. Overall, we found that higher BMI class was associated with increased odds of shoulder dystocia, independent of diabetes status (Figure 1). Underweight pre-pregnancy BMI was associated with decreased odds of shoulder dystocia when compared to normal weight. When compared to women without diabetes, those with gestational and pre-existing diabetes had significantly increased odds of shoulder dystocia (aOR 1.50, 95% CI 1.43-1.57; aOR 3.04 95% CI 2.68-3.46, respectively) (Table 1). A significant association was demonstrated between BMI category and shoulder dystocia for those with gestational diabetes and no diabetes. In contrast, we did not find a statistically significant relationship between BMI class and shoulder dystocia among women with pre-existing diabetes.

CONCLUSION: Diabetes status and higher BMI category are associated with increasing prevalence of shoulder dystocia. Prenatal education for women in these categories should emphasize the potential of shoulder dystocia as an adverse obstetrical outcome.

