VBAC Success in Women with Diabetes Mellitus Types I + II: A Pilot Study

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Introduction

Due to a notable rise in cesarean sections in the US since the 1970s, the American College of Gynecology has acted to reduce unnecessary cesarean deliveries (ACOG Practice Bulletin, Vol. 130, No. 5, p. e217). In November 2017, they released a bulletin outlining clinical management guidelines for vaginal birth after cesarean delivery (VBAC), which describes characteristics of good candidates for VBAC and included the outcome of a study that created a nomogram to predict VBAC success.
This research, done by Grobman et al. (2007) explored the different factors that impact a woman's VBAC success for delivery at term for a singleton pregnancy, finding six variables that significantly impact a woman's trial of labor after cesarean (TOLAC) (Grobman, 2007, p. 806). While the presence of diabetes was included in the group of factors evaluated in the study, it was not found to be a significant factor in predicting outcome and thus, was not included in the final nomogram (Table 1).

Factors Associated With Vaginal Birth After Cesarean Delivery in Multivariable Logistic Regression

Variable	Odds Ratio	95% Confidence Interval
Maternal age (y)	0.96	0.95–0.97
Body mass index (kg/m²) at first prenatal visit	0.94	0.93–0.95
Maternal race		
White and others	Referent	–
Latina	0.51	0.44–0.59
African American	0.51	0.44–0.59
Recurring indication for cesarean delivery	0.53	0.48–0.60
Any prior vaginal delivery	2.43	2.04–2.89
Vaginal delivery after prior cesarean	2.73	2.21–3.36

Table 1. Significant factors included in final VBAC nomogram
Grobman et al. Obstetrics & Gynecology 109(4):806-812, April 2007. (Table 2.)

However, in another study done by Mardy et al. (2016) on the factors that help predict VBAC success in preterm labor, presence of diabetes was found to be a significant variable (Mardy, 2016, p513.e5). This study will take a more detailed look at if pre-existing diabetes impacts a woman's TOLAC and whether or not it has a significant impact on achieving VBAC.

Aims and Objectives

Question: Does having Diabetes Mellitus, Type I or II, affect a woman's trial of labor after cesarean (TOLAC) success?

The goal of this study is to determine if there is a significant difference in VBAC success for women with pre-existing diabetes, when compared to women with no known diabetes diagnosis.

The results of this study have the potential to improve clinical care and decision-making surrounding delivery for pregnant women with diabetes and a history of one previous cesarean section. There is potential for this study to assist in decreasing the cesarean section rate through increased use of VBAC, as well as decrease potential complications that mothers with diabetes may experience during major abdominal surgery. It is possible that continued research on this topic will increase the practice and positive outcomes of performing VBACs.

Methods

A data pull of RO Beaumont charts was used to identify patients who received prenatal care from the Beaumont - Royal Oak outpatient OB/GYN clinic between January 1, 2012 and December 31, 2017. In order to qualify for this study, patients had to have a history of one and only one prior cesarean section, and had to deliver at Royal Oak Beaumont with a singleton gestation at term (>/= 37 weeks gestation).

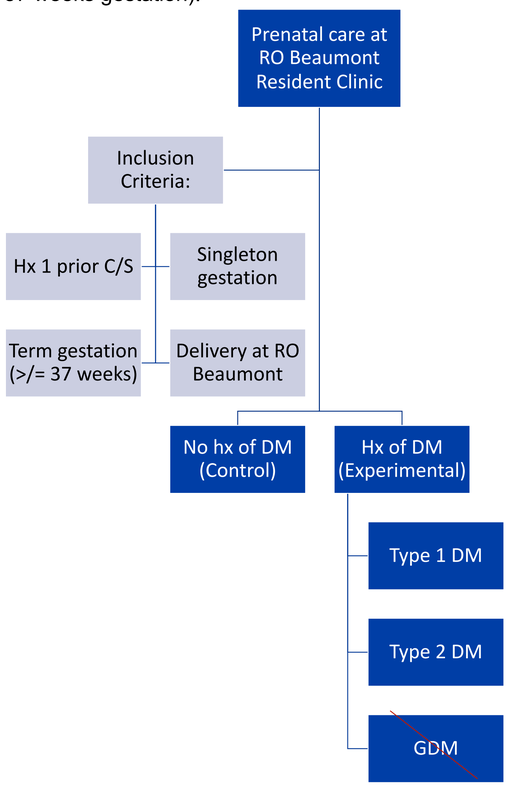

Figure 1. Patient inclusion and classification algorithm

Patients that qualified were divided into two groups. The control group was comprised of patients who met all inclusion criteria but had no documented history of any type of Diabetes Mellitus, including Type 1, Type 2, or Gestation Diabetes (GDM).
Patients put into the experimental group had a documented history of diabetes, either Type 1, Type 2, and/or GDM.
At this point, women with GDM in their current pregnancy, or those that had GDM in the past (without a diagnosis of T2DM in between) were excluded, as they do not fit the overall aim of assessing VBAC success in women with pre-existing diabetes.
Chart review of qualifying patients was performed in order to verify inclusion criteria and determine method of delivery for the pregnancy in question.

Results

Our initial data pull identified 81 patient encounters with patients who met criteria for the experimental group, being that they had a documented history of diabetes in their chart at the time of their delivery. Of note, patients who delivered more than one child at RO Beaumont but who met criteria with multiple deliveries were listed as multiple different encounters.

	T1DM	T2DM
TOLAC	1	0
Repeat C/S	0	4

Initially, 40 of these patients were identified as having GDM, 24 patients were identified as having T2DM, and 3 were identified as having T1DM. 14 patient encounters were identified only by a diagnosis of "diabetes mellitus" with no ICD-10 code or more specific diagnosis to classify them.
After chart review, only 5 patient encounters were women who met inclusion criteria and had a diagnosis of T1 or T2 DM. Of this group of 5, only 1 underwent TOLAC with successful VBAC, while 4 had an repeat cesarean section. 3 of these repeat c/s were planned repeats 2/2 health concerns or trouble with prior delivery, while 1 was described as "elective repeat."

Conclusions

The small number of patients fitting criteria hindered us from drawing a conclusion regarding the difference in VBAC success rate in women with pre-existing diabetes, when compared to control.

However, looking at this initial set of data did bring up more questions surrounding VBAC both in general and in this specific patient population. Specifically, we wonder how the presence and quality of counseling impacts a woman's decision to undergo TOLAC, and whether there has been an increase in TOLAC attempts over time.
Next steps for this study include expanding our years of data collection to look at how TOLAC/VBAC in recent years compares to the data from 2012-2017. In addition, we are interested in looking at what counseling is being done for these patients and whether or not it has a significant impact on a woman's decision to elect a TOLAC.

With more data, we hope to re-address our original question of whether or not the presence of pre-existing diabetes has a significant impact on VBAC success. Furthermore, we hope to look at whether or not type of pre-existing diabetes has any impact on success.

Limitations of this study include lack of exclusion criteria, including prior health history that may preclude a woman from attempting a vaginal birth. We hope to implement more detailed screening with our larger patient base.

In addition, we identified a discrepancy in diabetes diagnoses during chart review. Often women had conflicting diagnoses documented that made it difficult to definitively place patients into the proper group. Most commonly, women would have both T2DM and GDM listed in their chart, but upon reviewing birth records they were found to only have GDM. We believe addressing this issue will make future research and chart review for patient care more straightforward.

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