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Introduction

- Pregnancies complicated by diabetes encompasses both **gestational** and **pre-existing diabetes**
- The increased **perinatal risks** of pregnancies complicated by diabetes are **well known**.^{1 2}
- Third trimester surveillance is routinely performed in this risk group; however there is **limited evidence for the predictors of adverse perinatal outcomes**.^{3 4}

Objectives

Assess third trimester maternal and ultrasound markers in the prediction of risk for adverse perinatal outcomes in pregnancies complicated by pre-existing or gestational diabetes.

Methods

Design: Retrospective cohort study at TUH from January 2018 to December 2020.

Study Setting:

- Singleton, non-anomalous gestation
- Pre-existing (Type 1 or 2) or gestation diabetes
- Ultrasound between 34+0 to 37+1 weeks' gestation.

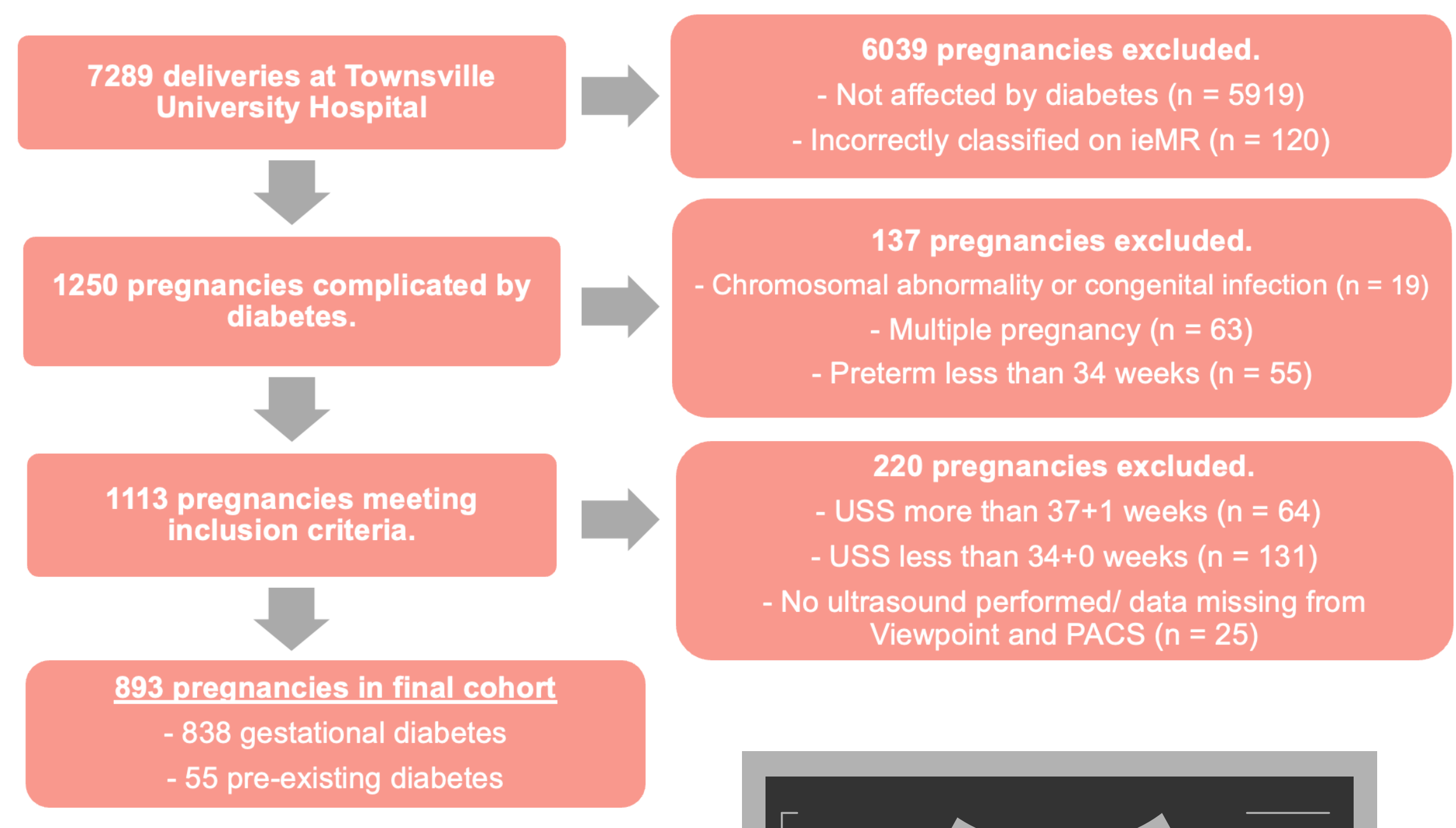
Independent variables:

- Maternal demographics.
- USS parameters:
 - **Biometry** - biparietal diameter (BPD), head circumference (HC), abdominal circumference (AC), estimated fetal weight (EFW)].
 - **Deepest vertical pocket (DVP)**.
 - **Doppler** - umbilical artery pulsatility index (UA PI), middle cerebral pulsatility index (MCA PA) and peak systolic velocity (MCA PSV), cerebroplacental ratio (CPR).

Perinatal outcomes:

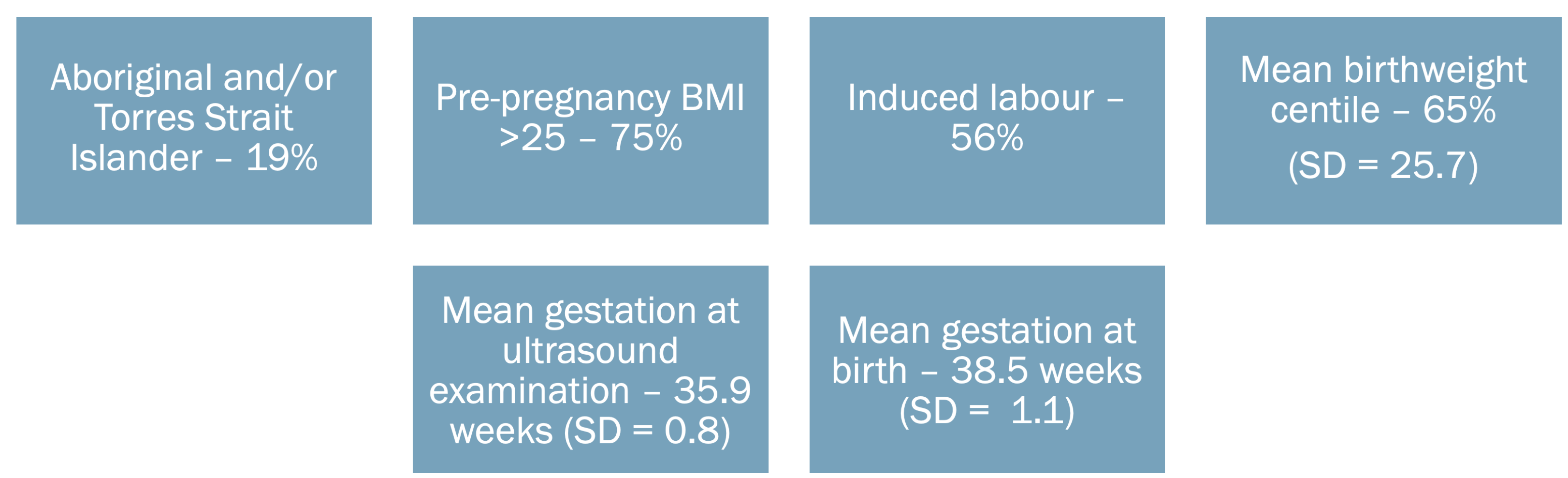
- Composite adverse outcome - 1 or more of:
 - NICU admission, 5-minute APGAR score <7, neonatal hypoglycaemia <2.6 within 48 hours, respiratory distress requiring intervention, jaundice requiring phototherapy, umbilical cord Ph <7.1 or lactate >6, and/or neonatal death.

Flowchart of Patient Selection

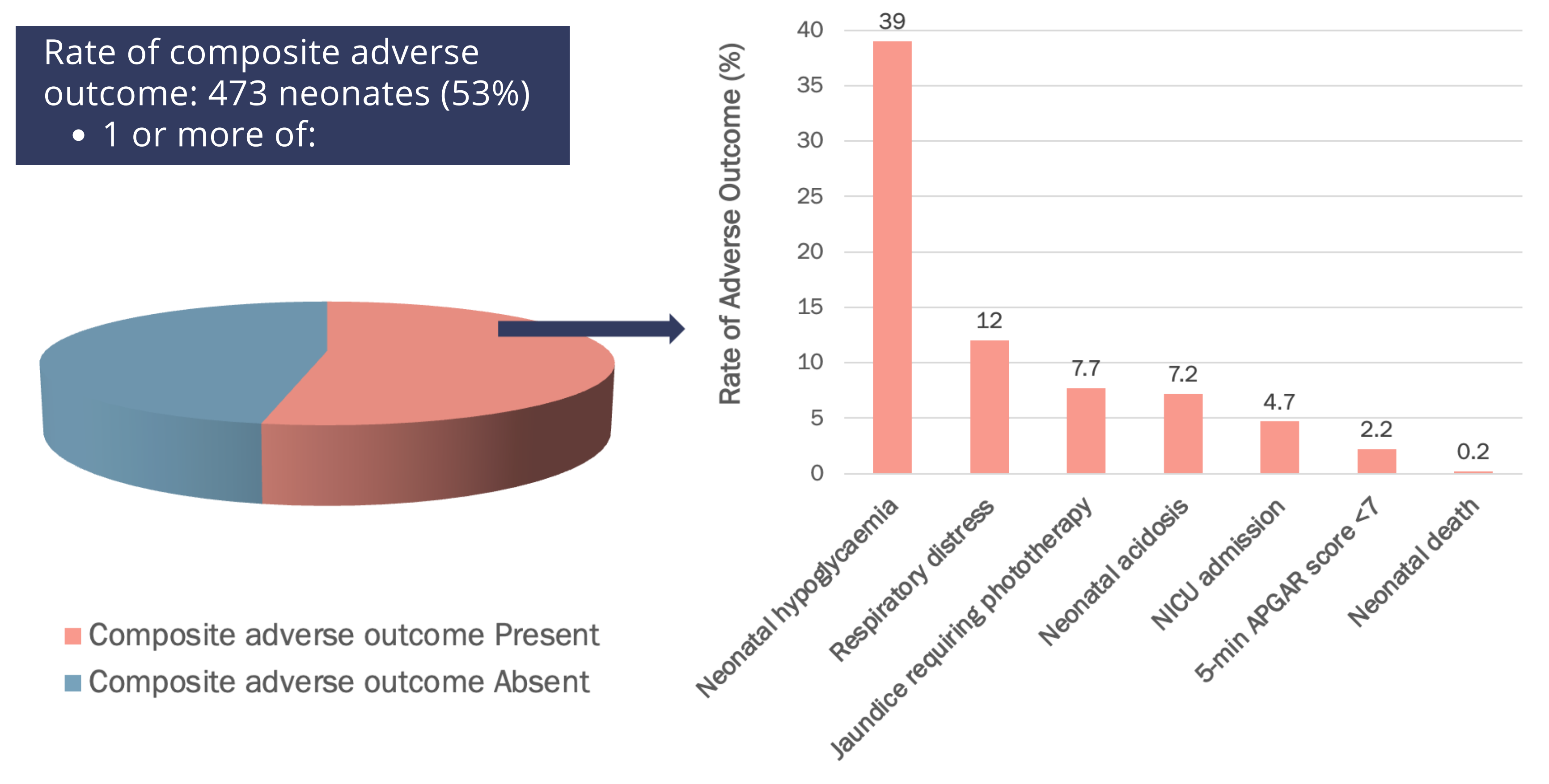


Results

Demographics - 893 participants (838 GDM; 55 pre-existing diabetes)

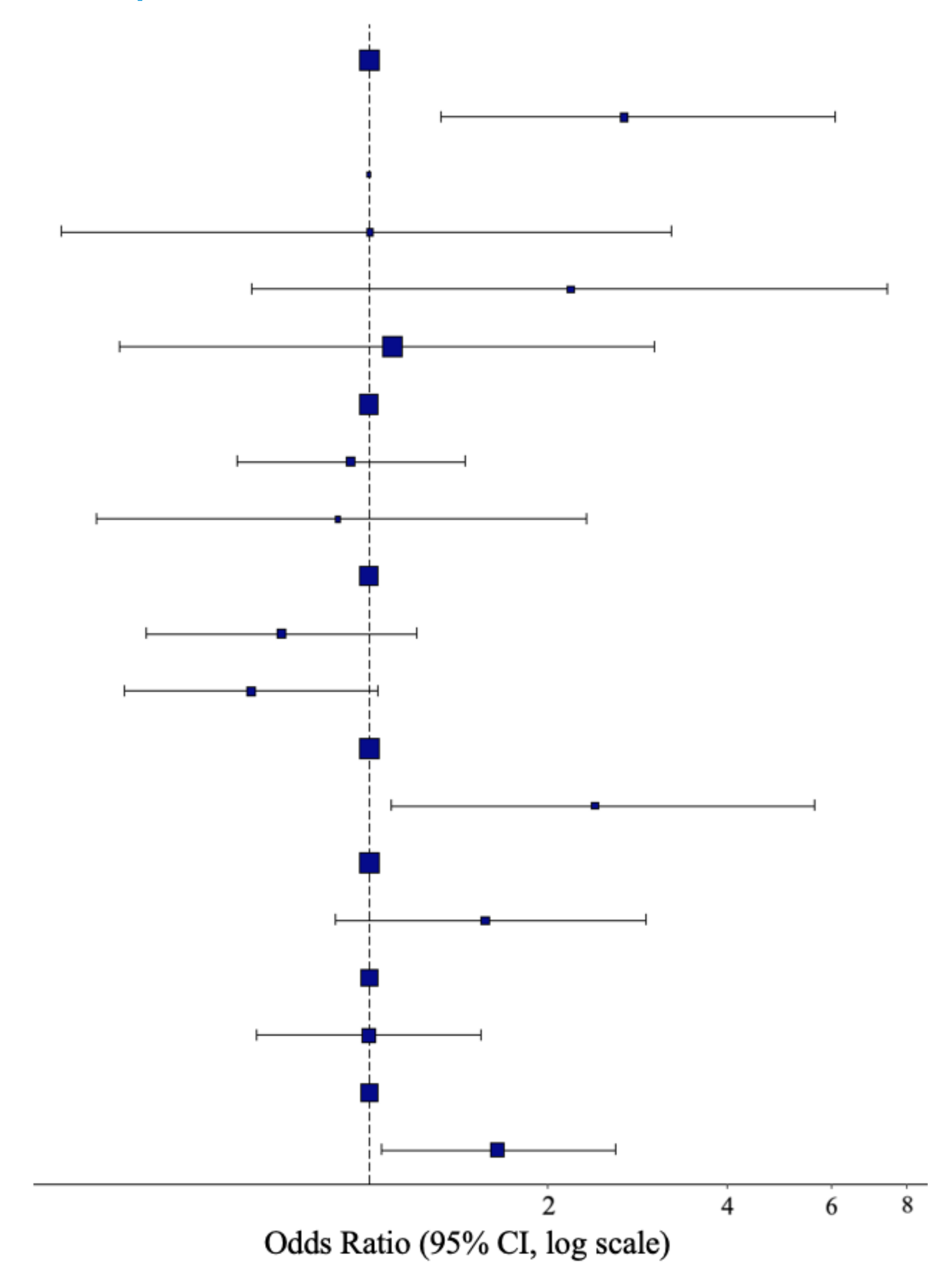


Perinatal Composite Adverse Outcome



Maternal and Ultrasound Predictors of a Composite Adverse Outcome

Variable	Value	OR (95% CI; P-value)
Type of diabetes	GDM	
	Pre-existing diabetes	2.69 (1.32-6.07; P=.10)
Hypertension	No hypertension	
	Gestational hypertension	1 (0.3-3.22; P>.99)
	Pre-eclampsia/Eclampsia	2.18 (0.63-7.43; P=.20)
	Pre-existing hypertension	1.09 (0.38-3.02; P=.90)
UA PI	5 th -94 th	
	≤5 th	0.93 (0.6-1.45; P=.75)
	≥95 th	0.89 (0.35-2.32; P=.80)
MCA PI	5 th -94 th	
	≤5 th	0.71 (0.42-1.2; P=.21)
	≥95 th	0.63 (0.39-1.04; P=.07)
CPR	>5 th	
	≤5 th	2.4 (1.09-5.61; P=.035)
DVP	≤8cm	
	>8cm	1.57 (0.88-2.92; P=.14)
AC	<90 th	
	≥90 th	1 (0.65-1.54; P>0.99)
EFW	<90 th	
	≥90 th	1.64 (1.05-2.59; P=.031)



- Pre-existing diabetes (OR 2.69; 95% CI 1.32-6.07; P=.010)
- Cerebroplacental ratio (CPR) ≤ 5th centile (OR 2.4; 95% CI 1.09-5.61; P=.035)
- Estimated fetal weight (EFW) ≥ 90th centile (OR 1.64; 95% CI 1.05-2.59; P=.031)

Conclusions

- Presence of pre-existing diabetes, CPR ≤ 5th centile and EFW ≥ 90th centile are significant predictors of risk for adverse perinatal outcome in pregnancies complicated by diabetes.
- Further longitudinal prospective research evaluating these markers with adverse outcome and optimal timing of delivery is needed to provide better quality data for decision making in this high-risk group.

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