

Diabetes in Pregnancy

Cecilia T. Gambala, MD, MSPH, FACOG
Maternal Fetal Medicine
Tulane University School of Medicine



Objectives

- At the conclusion of this session, attendees will be able to:
 - Discuss the importance of diabetes in pregnancy
 - Understand the immediate and long-term risks of GDM
 - Diagnose gestational diabetes, GDM
 - List the various treatment strategies during pregnancy to improve outcomes

Background

- 7% of pregnancies complicated by any diabetes – 86% GDM
- Diagnosis is challenging
- Pregnancy is a normal state of insulin resistance to promote fetal growth
- Increased prevalence in African Americans, Pacific Islanders, Latinx and Native Americans
- Increased prevalence in women with obesity, delayed childbearing and sedative lifestyles

Complications from GDM

MATERNAL RISKS

Preeclampsia/Gestational HTN

Increased weight gain

Delivery complications

----- Labor dystocia

----- Vaginal lacerations

----- Cesarean delivery

Weight retention

Diabetes

Dyslipidemia

Ischemic heart disease

NEONATAL RISKS

Macrosomia

Shoulder dystocia

Preterm delivery

Hyperinsulinemia

Hypoglycemia

Hyperbilirubinemia

Polycythemia

Delayed pulmonary maturity

Metabolic syndrome

High blood pressure



Early Identification and Diagnosis

Risk Factors

- Maternal age >25 yo
- Obesity
- Hypertension
- Prior pregnancy affected by GDM
- Prior unexplained perinatal loss or child with congenital anomaly
- Hx of impaired glucose tolerance
- Polycystic ovarian syndrome
- Family hx of diabetes
- Glucosuria
- Multiple gestation
- **WEIGHT GAIN**
 - Excessive GWG
 - Significant weight gain in early childhood
 - Interpregnancy weight gain

Diagnosis

- Most commonly used: 2 step approach
 - Initial 1-hour screening 50-g glucose challenge test
 - If 1-hour screen + → 100-g 3-hour GTT
- Single 2-hour approach, 75-g GTT
- WHO 2013: Fasting plasma glucose level > 5.1-6.9 mmol/L

- Universal screening 24 to 28 weeks of gestation
- If risk factors exist, then more prompt diagnosis

Glucose Challenge Tests

- 50-g oral glucose challenge regardless of fasting or postprandial state
- 3 commonly used thresholds for “positive screens”
 - ≥ 130 mg/dL (7.2 mmol/L; 88-99% sens/66-77% spec)
 - ≥ 135 mg/dL (7.5 mmol/L)
 - ≥ 140 mg/dL (7.8 mmol/L; 70-88% sens/69-89% spec)
 - **IF ABNORMAL AS ABOVE THEN fasting 3 hr GTT**
- **≥ 200 mg/dL, then GDM diagnosed no 3hr GTT needed**

Criteria for Diagnosis of GDM by 3 hr GTT

Criteria for GDM diagnosis					
	Carpenter-Coustan (100 gm; Two-Step)	NDDG (100 gm; Two-Step)	CDA (75 gm; Two-Step)	WHO (75 gm; One Step)	IADPSG (75 gm; One Step)
Plasma Glucose					
Fasting (mg/dL)	95	105	95	92–125	92–125
One-hour (mg/dL)	180	190	191	180	180
Two-hour (mg/dL)	155	165	160	153–199	153
Three-hour (mg/dL)	140	145	—	—	—

Abbreviations: CDA, Canadian Diabetes Association; IADPSG, International Association of Diabetes and Pregnancy Study Groups; NDDG, National Diabetes Data Group; WHO, World Health Organization.

Early screening versus routine

Early gestational diabetes screening in obese women: a randomized controlled trial



Lorie M. Harper, MD, MSCI; Victoria Jauk, MPH; Sherri Longo, MD; Joseph R. Biggio, MD, MS; Jeff M. Szychowski, PhD; Alan T. Tita, MD, PhD

< 20 weeks versus > 24 weeks

Outcomes for 922 obese women (AA, Hispanic)

Primary outcome – macrosomia, primary CD, HTN, shoulder dystocia and neonatal hyperbilirubinemia and hypoglycemia

RESULTS: No reduction in composite perinatal outcomes

Earlier gestational age at delivery for early screening



Management – to reduce risks

Comprehensive care

- Dietary counseling by diabetic educator/counselor, MFM referral
- Prescription for glucose monitor and supplies
- Logbook or app for glucose recordings, food logs, activity
- HOME GLUCOSE MONITORING:
 - Fasting and either 1-hour or 2-hour postprandial glucose levels
 - If poor control, add pre-prandial and/or 2-3 am
- Goal:
 - Fasting blood sugar ≤ 95 mg/dL (5.3 mmol/L)
 - 1-hour postprandial ≤ 140 mg/dL (7.8 mmol/L)
 - 2-hour postprandial ≤ 120 mg/dL (6.7 mmol/L)

Dietary & Lifestyle Changes

- Limit carbs to 40 to 50% of calories
- Avoid processed sugars or preservatives
- Review Academy of Medicine guidelines for weight gain in pregnancy by BMI
- No evidence-based guidelines for exercise in GDM

- Increase exercise activity with provider guidance (relative and absolute contraindications)
- Aerobic exercise
- Resistance strength training

Medical management

- Medication required when $\geq 50\%$ of glycemic measures above the target ranges
- Oral hypoglycemic agents & insulin therapy are acceptable
 - *Insulin: does not cross the placenta; only regimen approved by the FDA for GDM treatment*
 - Metformin if insulin can not be obtained or concern for compliance

Insulin dosing for GDM

Weeks Gestational Age	Units Insulin per Weight in kg per day
0 to 13 6/7	0.7
14 to 27 6/7	0.8
28 to 35 6/7	0.9
36 to delivery	1.0

Insulin management

- Total daily insulin requirement: $\frac{2}{3}$ long- acting and $\frac{1}{3}$ short-acting
 - Short-acting then subdivided into 3 doses taken with meals
- Long acting: glargine (Lantus), NPH (Novolin), detemir (Levemir)
- Short acting: aspart, lispro, regular

Antepartum Care & Timing of Delivery

- Serial growth assessments every 4-6 weeks from time of diagnosis to delivery at 39 weeks' gestation if well controlled
- *If poor glycemic control 37 to 39 weeks' gestation*
- Antepartum fetal testing if more intense therapy or complications arise
 - Insulin or oral meds
 - Polyhydramnios
 - GHTN
 - IUGR (less common)

Intrapartum care

- Counseling on potential complications
- Consider MFM consultation and assistance as needed
- Maintain glycemic control at <110 mg/dL
- Mode of delivery is dependent on EFW and glycemic control
- Presence of immediate pediatric care & evaluation
- Discuss option for cesarean delivery if EFW ≥ 4500 g

Postpartum care

- Emphasize importance of diagnostic testing for DM
- 70% will develop DM later in life
 - 40-50% will develop DM within 10 years
- All should undergo 75-g GTT 4-12 weeks postpartum
 - If negative → rescreen q 3 years with PCP
- Encourage breastfeeding, regular physical activity, and formal nutrition programs

- ***New considerations – 2 day postpartum inpatient evaluation***

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Thank you!
Have a safe and happy New Year!

