Prenatal Care – Gestational Diabetes Mellitus Risk and Management

Week 41

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Homework Assignment
Podcast: Dr. Chapa’s ObGyn Pearls, Gestational Diabetes Update. March 17, 2018

Review ACOG Practice Bulletin # 190, February 2018
Gestational Diabetes Mellitus
LEARNING OBJECTIVES

• To gain an understanding of the impact of GDM on pregnancy

• To be able to identify risk factors for GDM

• To review screening and diagnostic tests for GDM

• To be able to list the different tiers of management

• To be comfortable providing patients counseling on GDM during and after their pregnancies
CASE VIGNETTE

• D.B. is a 28 y.o. G2P0010 at 12 weeks by LMP c/w 10wk u/s presents for new ob visit. She denies pain or bleeding.

• She reports mild nausea which doesn’t interfere with her appetite. She and her boyfriend have been planning this pregnancy and are very excited.
FOCUSED HISTORY

What will be pertinent in her history?

• POB: No prior pregnancies
• PGYN: Regular menses; No STI/cysts/fibroids; No abnormal paps
• PMH: Obesity
• PSH: Laparoscopic cholecystectomy 3 years ago
• Meds: PNV
• All: NKDA
• Soc: No toxic habits; Exercises 2-3x/month; Lives with her husband; Works as a librarian; Accepts blood products
• FHx: Native American descent; No hx gyn cancers; Both parents and sister with DM
PERTINENT PHYSICAL EXAM FINDINGS

• What will be pertinent in her physical exam?

• **VS:** P 76  BP 117/74  Wgt: 85kg  Hgt: 160cm

• **HEENT:** *Thyroid:* no masses/enlargement  
  *Skin:* no acanthosis nigricans

• **Cor:** Regular rhythm, no M

• **Pulm:** CTAB b/l

• **Abd:** Soft, NT/ND, +BS x 4Q

• **Pelvic:** *Vulva:* Normal external female genitalia; No lesions  
  *Vagina:* Healthy-appearing mucosa, No discharge  
  *Cervix:* Parous os; L/C/P  
  *Uterus:* NT, ~8wk size, anteverted  
  *Adnexae:* No mass/tenderness b/l

• **Ext:** No calf tenderness b/l; +1 DTR b/l
What is the relationship between pregnancy and blood glucose levels?

PATHOPHYSIOLOGY

HPL → Cortisol
HPL → Estrogen

Insulin → Insulin Receptor

Glucose → Cell Membrane

HPL
ANTENATAL IMPLICATIONS

Your patients asks you what the risks are to her and her baby if she develops GDM. What do you tell her?

Maternal
• Preeclampsia
• Cesarean delivery
• Development of DM

Fetal
• Macrosomia
• Shoulder dystocia
• Hyperbilirubinemia
• Neonatal hypoglycemia
• Stillbirth
• Obesity and diabetes later in life
EVALUATION

What are the standard screening and diagnostic tests employed to diagnose GDM?

**Screening:** 24-28 weeks gestation
- 50-g oral glucose solution ➡ 1-hr venous glucose determination
- Values > screening threshold (130-140 mg/dL, depending on institution)
  ➡ Diagnostic test

**Diagnosis:** 100-g 3-hour diagnostic OGTT
- >2 values meeting or exceeding threshold

<table>
<thead>
<tr>
<th>Values</th>
<th>Carpenter and Coustan</th>
<th>NDDG</th>
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<tbody>
<tr>
<td>Fasting</td>
<td>95</td>
<td>105</td>
</tr>
<tr>
<td>1-hour</td>
<td>180</td>
<td>190</td>
</tr>
<tr>
<td>2-hour</td>
<td>155</td>
<td>165</td>
</tr>
<tr>
<td>3-hour</td>
<td>140</td>
<td>145</td>
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</table>
EVALUATION

• Diagnosis: 75-g 2-hour OGTT
  • >1 abnormal value meeting or exceeding threshold

<table>
<thead>
<tr>
<th>Values</th>
<th>IADPSG</th>
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<tbody>
<tr>
<td>Fasting</td>
<td>92</td>
</tr>
<tr>
<td>1-hour</td>
<td>180</td>
</tr>
<tr>
<td>2-hour</td>
<td>153</td>
</tr>
</tbody>
</table>

• ACOG recommendations
  • A1c at initial prenatal visit for every patient
EARLY SCREENING

What are indications for administering the screening test earlier than 24-28wks EGA?

Overweight/obese AND

- Hx GDM
- Prior infant ≥ 4kg
- A1c ≥ 5.7%
- HTN
- PCOS
- Physical inactivity
- Impaired glucose tolerance/fasting glucose on prior testing
- Conditions associated with insulin resistance (BMI ≥ 40kg/m², Acanthosis nigricans)
- First-degree relative with diabetes
- High-risk race/ethnicity (African American, Latino, Native American, Asian American, Pacific Islander)
- HDL < 35mg/dL, TG > 250mg/dL
- Hx CVD
Your patient asks what the initial steps would be if she is diagnosed with GDM?

- Nutrition counseling
- Blood glucose monitoring 4x/day

<table>
<thead>
<tr>
<th>Timings</th>
<th>Targets</th>
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<tbody>
<tr>
<td>Fasting</td>
<td>&lt;95 mg/dL</td>
</tr>
<tr>
<td>1-hour postprandial</td>
<td>&lt;140 mg/dL</td>
</tr>
<tr>
<td>2-hour postprandial</td>
<td>&lt;120 mg/dL</td>
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MANAGEMENT

What are the management options for maintenance of optimal blood glucose levels?

• Lifestyle modifications (diet and exercise)
• Pharmacologic therapy
MANAGEMENT – LIFESTYLE MODIFICATIONS

• Demonstrated reduction in LGA, macrosomia, and neonatal fat mass

• Goals:
  • Normal blood glucose levels
  • Preventing ketosis
  • Adequate weight gain
  • Appropriate fetal growth/development

• Three meals and 2-3 snacks daily to reduce pp glucose fluctuations

• **Diet composition:** Carbohydrates 33-40%, Fat 40%, Protein 20%
  • Carbohydrates: Complex > Simple

  - Lower likelihood of significant postprandial hyperglycemia
  - Greater potential to reduce insulin resistance
  - Slower to digest

• **Exercise:** Moderate exercise
  • Aim: 30 minutes of moderate-intensity aerobic exercise >5 days/week
MANAGEMENT – PHARMACOLOGIC THERAPY

• **Injectable**
  • Insulin
    • ACOG: Insulin is considered the preferred treatment when pharmacologic treatment of GDM is indicated

• **Oral** (NB: NOT approved by the U.S. FDA for treatment of GDM)
  • Metformin
    • ACOG: Reasonable alternative choice when:
      Patient declines insulin therapy
      Provider believes patient will be unable to safely administer insulin
      Patient cannot afford insulin

• Glyburide
  • ACOG: In most studies, Glyburide does NOT yield equivalent outcomes to insulin or metformin and should NOT be recommended as a first-choice pharmacologic treatment
<table>
<thead>
<tr>
<th>Insulin</th>
<th>Metformin</th>
<th>Glyburide</th>
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</thead>
<tbody>
<tr>
<td>• Doesn’t cross the placenta</td>
<td>• Crosses placenta and limited long-term data in exposed offspring</td>
<td>• Crosses placenta and higher rates of neonatal hypoglycemia compared to insulin</td>
</tr>
<tr>
<td>• Starting dosage – 0.7 - 1.0 units/kg daily</td>
<td>• Inhibition of hepatic gluconeogenesis and glucose absorption</td>
<td>• Increased insulin secretion and peripheral insulin sensitivity</td>
</tr>
<tr>
<td>• Multiple injections using combination of long/intermediate-acting &amp; short-acting insulin</td>
<td>• Stimulation of peripheral glucose uptake</td>
<td>• Contraindicated in pts with sulfa allergy</td>
</tr>
<tr>
<td></td>
<td>• Starting dose: 500mg nightly</td>
<td>• Starting dose: 2.5-5mg daily in divided doses</td>
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ANTENATAL SURVEILLANCE

What are the recommendations for fetal surveillance in patients with GDM?

- **GDM A2** or *poorly controlled*
  - Initiate at *32w*

- **GDM A1**
  - No consensus

*NB: No studies demonstrating an increase in stillbirth with well-controlled A1 GDM before 40wks*
Deliveries

What are the recommendations regarding timing of delivery for patients with GDM?

- **A1 GDM**
  - Delivery should NOT be before 39 weeks
  - Expectant management up to 40 6/7 weeks is appropriate

- **A2 GDM, well controlled**
  - Delivery between 39 – 39 6/7 weeks

- **A2 GDM, poorly controlled**
  - Delivery between 37 - 38 6/7 weeks
POSTPARTUM TESTING

How would you manage a patient with GDM after her pregnancy is completed?

• Screening at 4 – 12 weeks postpartum with a 75-g 2-hour OGTT

• Early GCT at subsequent pregnancies
POSTPARTUM COUNSELING

How do you counsel a patient with GDM during her postpartum visit?

• Encourage lifestyle modifications

• Potentially a sevenfold increased risk of T2DM compared with women without a history of GDM

• All patients with GDM – follow up with a PCP and repeat testing every 1-3 years

• DM or Impaired pp fasting glucose/glucose tolerance ▶ Treatment or preventive therapy referral
<table>
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<tr>
<th>Diagnosis</th>
<th>Code</th>
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<tbody>
<tr>
<td>Gestational diabetes mellitus</td>
<td>O24.4</td>
</tr>
<tr>
<td>Gestational diabetes mellitus in pregnancy, diet controlled</td>
<td>O24.410</td>
</tr>
<tr>
<td>Gestational diabetes mellitus in pregnancy, insulin controlled</td>
<td>O24.414</td>
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<tr>
<td>Gestational diabetes mellitus in pregnancy, unsp controlled</td>
<td>O24.419</td>
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</table>
SOCIAL DETERMINANTS OF HEALTH

2017 – Publicly versus privately insured patients with pregestational diabetes

<table>
<thead>
<tr>
<th>Disparity</th>
<th>Public</th>
<th>Private</th>
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<tr>
<td>Likely to receive a preconception consult</td>
<td>5.7%</td>
<td>31.9%</td>
</tr>
<tr>
<td>Rates of HbA1c &lt;6%</td>
<td>37.2%</td>
<td>58.4%</td>
</tr>
<tr>
<td>Rates of pregnancy affected by congenital anomalies</td>
<td>10.4%</td>
<td>2.2%</td>
</tr>
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A preconception consult is an evidence-based intervention known to improve pregnancy outcomes associated with pregestational diabetes, such as HbA1c and risk of congenital anomalies.

• More education needs to be provided for publicly insured patients during postpartum visits towards improving the rates of preconception counseling visits
• Providers can take the opportunity to offer preconception counseling during annual gyn visits to ensure that patients are receiving the necessary education and services to improve pregnancy outcomes in patients with pregestational and gestational diabetes.
Reference
• .BBonGDMPost

• Description: GDM Postpartum Visit Counseling

• The patient was counseled on the increased risk of developing GDM in subsequent pregnancies, as well as an increased of diabetes diagnosis beyond the postpartum period and associated sequelae. We discussed the importance of completing a 2-hour glucose tolerance test 6-12 weeks after delivery, and also the need for follow-up with a PCP to ensure testing for DM every 1-3 years.

