

# GDM: Gestational Diabetes Mellitus



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# Description of Patient



- Veronica Delgado
- Age: 31
- 22<sup>nd</sup> week of pregnancy
- Family hx of diabetes
- Hispanic decent
- Wt. 175lbs- pre pregnancy 165lbs
- Taking prenatal vitamins
- Patient states increased appetite and thirst

# Lab Values



- High Osmolality (296, normal 285-295mmol/kg/H<sub>2</sub>O)
- High Glucose (186, normal 70-110mg/dL)
- High TG (155, normal 35-135mg/dL)
- High HbA<sub>1c</sub> (8.5, normal 3.9-5.2%)
- Low HTC (36.5, normal 37-47%)
- Low Ferritin (12, normal 20-120mg/mL)
- High Urine Glucose (+2mg/dL)

# Etiology/Disease Measures



- Cause is unknown
- Affects approx. 14% of all pregnancies in the US
- During pregnancy the placenta produces high amount of hormones, that impair the action of insulin
- As baby grows, placenta produces high amounts of insulin-interfering hormones, not allowing insulin in to your cells, provoking a rise in blood sugar that can affect the growth and development of the baby
- Usually develops during last half of pregnancy, rarely though can occur as early as the 20<sup>th</sup> week

# Risk Factors



- Being older than 25
- Overweight; BMI of 30 or above
- Race
  - For unclear reasons, women who are black, Hispanic, American Indian, or Asian, have a higher likelihood
- Family or personal health history
  - Prediabetes-a precursor to type 2 diabetes
  - More likely to develop GDM if had it during previous pregnancy
  - Or if previous baby weighed more than 9 lbs
  - Or if had an unexplained stillbirth

# Complications that Can affect your baby if you have GDM



- **Developmental Problems**
  - Increased risk w/ motor skill development with balance and coordination
  - Increased risk of attention problems of hyperactivity disorders
- **Jaundice**
- **Type 2 Diabetes later in life**
  - Babies born to mothers with GDM have a higher risk of being obese and developing type 2 diabetes later in life
- **Respiratory Distress Syndrome**
  - Babies born to women with GDM have a higher rate of respiratory problems than do those born to women w/o GDM even at same gestational age
- **Low Blood Sugar: hypoglycemia**
  - Babies of mothers with GDM can develop hypoglycemia shortly after birth because their own insulin production is high.
- **Excessive growth**
  - Extra glucose can cross the placenta, which triggers the baby's pancreas to make extra insulin, causing the baby to grow too large, know as macrosomia.

# Complications for the Mother



- **Future Diabetes**
  - More likely to have GDM with future pregnancies
  - More likely to develop type 2 diabetes when older
  - Women who reach their ideal body weight after delivery have less than a 25% chance of developing type 2 diabetes
- **Urinary Tract Infections**
  - Experience 2x the number of UTI's during pregnancy than other pregnant women, caused by excess glucose in the urine
- **Preeclampsia**
  - High Bp and excess protein in the urine after the 20<sup>th</sup> week of pregnancy
    - ✦ Only cure is delivery of the baby

# Screening



- **2 Step System**
- **Initial Glucose Challenge Test**
- **50-g oral glucose test (GCT)**
  - 24-28 weeks of gestation
  - Drink glucose solution
  - 1 hr glucose level  $>140\text{mg/dL}$  referred for OGTT
- **100-g oral glucose test (OGTT)**
  - Fast overnight of 8-14 hours
  - Carb loading 3 days including more than 150g carbs
  - Higher concentration of glucose solution
  - Blood glucose checked every hour, 3x
  - If at least 2 of the 3 readings are higher than normal, you will be diagnosed with GDM

# Plasma Glucose Criteria for GDM



<b>Time</b>	<b>100 g Glucose Load, mg/dL (mmol/L)</b>
• Fasting	95 (5.3)
• 1-h	180 (10.0)
• 2-h	155 (8.6)
• 3-h	140 (7.8)

# Treatment



- Controlling blood sugar level is essential to the health of the baby, and avoiding complications during delivery!
- Blood Sugar Monitoring
  - Check 4x-5x/day
  - 1<sup>st</sup> thing in the morning, and after meals
- Diet
- Exercise
- Medication

# Nutrition Therapy



- Eating the right kind and the right amount of food is the best way to control blood sugar level!
  - Fruits and vegetables
  - Whole grains
  - High nutritional value, low in fat and calories
  - Limit carbs and sweets
    - ✦ Avoid large meals
    - ✦ Total of 6 feedings/day, 3 major meals, 3 snacks
      - Carbs 35-40% of diet
      - Protein 20-25 %
      - Fat 35-40%
      - 36 kcal/kg actual weight
        - Shown to reduce hyperglycemia and plasma triglycerides

# Behavioral Therapy



- **Exercise!**
- **Lowers blood sugar level**
  - Transports sugar to cells to be used for energy
- **Increases sensitivity to insulin**
  - Therefore body needs less insulin to transport sugar to cells
- **Prevent discomforts of pregnancy**
  - Back pain, muscle cramps, swelling, constipation, and difficulty sleeping
- **Helps prepare you for labor and delivery**
- **W/ doctors ok....**
  - Moderate aerobic exercise
  - Most days of the week
  - Start slowly if haven't been active
  - Walking, cycling, swimming

# Medication Therapy



- If diet and exercise aren't enough....
  - Insulin injections
  - Currently Recommended:
    - ✦ Fasting Plasma glucose: 90-99mg/dL
    - ✦ One hr. postprandial plasma glucose <140mg/dL
    - ✦ Two hr. postprandial plasma glucose <120-127mg/dL
      - Lower blood sugar levels
      - About 15% of women w/ GDM need insulin therapy
      - Some women need an oral medication

# Oral Hypoglycemic Agents



- **Metformin**
  - Decreasing hepatic glucose output
  - Crosses placenta and cord levels can be higher than maternal levels
  - Increased rates of preeclampsia, and perinatal mortality when used in 3<sup>rd</sup> trimester
- **Glyburide**
  - Equally as safe and effective as insulin
  - Safe in breastfeeding, with no transfer to milk

# Periodic Fetal Biophysical Testing



Test	Frequency	Reassuring Result	Comment
Fetal Movement counting	Every night starting 28 <sup>th</sup> week	10 movements in <60 min	Performed in all patients
Nonstress Test (NST)	Twice weekly	2 heart rate accelerations in 20 min	Begin at 28-34 wk with insulin-dependent diabetes, and begin at 36 wk in diet-controlled GDM
Contraction Stress Test	Weekly	No heart rate decelerations in response to 3 contractions in 10 min	Same as for NST
Ultrasonographic Biophysical profile	Weekly	Score of 8 in 30 min	3 movements=2 1 flexion=2 30 s breathing=2 2 cm amniotic fluid=2

# Mrs. Delgado's Prognosis



- GDM
- 3-4 units of Aspart prior to each meal
- 10 units Lantus at bedtime
- 2700 kcal/day
- At least 169 grams of protein
- 270 grams of carbs
- 105 grams of fat
- Postprandial glucose level should be less than 140 mg/dL

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