Hyperglycemia in Pregnancy

Tina Kelly, MS, RD, LD, CDE
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Stay tuned for a Fun Food Fact at the end of this presentation!
The Incidence of Diabetes is on the Rise!

- Type 1, Type 2, Gestational Diabetic (GDM)
- Women with GDM 7 x more likely to develop Type 2 Diabetes
- Children of pregnancies affected by GDM at greater risk for obesity and Type 2 Diabetes
- 5-10% of women with GDM are found to actually have Type 2 DM
- Women with hx of GDM have a 35-60% chance of developing DM in the next 10-20 years
2011 ADA Guidelines Diagnosing Hyperglycemia in Pregnancy

- Refer to algorithm
- Able to now diagnose type 2 diabetes in pregnancy; and GDM earlier
- 50 gm screen and 100 gm, 3 hr OGTT no longer standard protocol
Diagnosing

- <13 weeks with 1 risk factor present – use 1 of 3 diagnostic tests
- 13-23 6/7 weeks and risk factors present – 75 gm, 2 hr OGTT
- 24-28 weeks – universal testing with 75 gm, 2 hr OGTT
What Does This Mean?

- Will likely see more women being diagnosed with type 2 and GDM earlier in their pregnancies
Medical Nutrition Therapy (MNT) Outcome Goals

- Adequate nutrient intake
  - Calories
  - Vitamins and minerals
- Appropriate weight gain
- Blood glucose in target range
- Limit episodes of hypoglycemia in women requiring medication
Individualized Meal Plan

- Registered Dietitian (RD) should complete nutrition assessment and develop MNT plan for women with:
  - Pre-existing diabetes (type 1, type 2)
  - GDM, especially if on medication
  - Diabetes related complications (hypertension, nephropathy, retinopathy, gastroparesis)
MNT Assessment

- Pre-pregnancy weight
- Food intolerances and cravings
- Appetite
- Intake of raw or undercooked meats, eggs, milk
- Prenatal supplementation
- Food program participation/assistance
- Substance/medication use
- Physical activity
- Labs and medical history
- Planned method of infant feeding
MNT Intervention Steps

- 1st – Determine weight gain goals
- 2nd – Calculate energy/calorie needs
- 3rd – Develop meal plan
Weight Gain Goals

- Determine pre-pregnancy weight category
  - Underweight
  - Normal Weight
  - Overweight
  - Obese
Guidelines

- Based on the World Health Organization BMI categories rather than the categories from the Metropolitan Life Insurance tables
- Include a specific and relatively narrow range of recommended gain for obese women
## Weight Gain Recommendations

<table>
<thead>
<tr>
<th>Prepregnancy BMI</th>
<th>BMI (kg/m²) (WHO)</th>
<th>Total Weight Gain Range (lbs)</th>
<th>Rates of Weight Gain 2nd and 3rd Trimesters (Mean range in lbs/wk)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt;18.5</td>
<td>28-40</td>
<td>1 (1-1.3)</td>
</tr>
<tr>
<td>Normal Weight</td>
<td>18.5-24.9</td>
<td>25-35</td>
<td>1 (0.8-1)</td>
</tr>
<tr>
<td>Overweight</td>
<td>25.0-29.9</td>
<td>15-25</td>
<td>0.6 (0.5-0.7)</td>
</tr>
<tr>
<td>Obese</td>
<td>≥30.0</td>
<td>11-20</td>
<td>0.5 (0.4-0.6)</td>
</tr>
</tbody>
</table>
Calculate Calorie Needs

**Estimated Energy Requirement (EER)**

\[
\text{EER} = 354 - (6.91) \times A = PA \times (9.36 \times \text{Wt} = 726 \times \text{Ht})
\]

- **A** = age (years)
- **PA** = physical activity coefficient
  - (sedentary 1.0; moderately sedentary 1.12, active 1.27)
- **Wt** = weight (kg)
- **Ht** = height (meters)

*Note – all multiplication steps are completed before addition and subtraction, regardless if outside or within parenthesis*
EER

- Can be used to calculate preconception calorie needs or initial pregnancy calorie needs

- For pregnancy, add 300 calories per day for the 2\textsuperscript{nd} and 3\textsuperscript{rd} trimesters
Calculate Calorie Needs

Based on gestational age (for normal weight women)

- **1st trimester:** Adult EER + 0
- **2nd trimester:** Adult EER + 160 kcal (8 kcal/wk x 20 wk) + 180 kcal
- **3rd trimester:** Adult EER + 272 kcal (8 kcal/wk x 34 wk) + 180 kcal
No consensus on determining calorie needs for overweight and obese pregnant women – a dietetics professional should evaluate

Some women, especially those who are sedentary and/or live in developing countries, may not need the additional calories (ADA Position Statement 2002)
Develop Meal Plan

- Individualized and culturally sensitive
- Meal and snack timing/schedule
- Easy to use and follow
Meal Plan Basics

- Three small meals and 3-4 snacks, evenly spaced (help prevent hypoglycemia and control post prandial glucose)
- CHOs (especially simple) at first meal limited (greatest insulin resistance at this time)
- Evening snack (to prevent starvation ketosis overnight)
- Minimum 1800 calories
Recommended Intake From Food Groups

- Starch - ≥ 7
- Fruit - ≥ 2
- Milk - ≥ 3
- Vegetables - ≥ 4
- Protein - ≥ 7
- Fat - ≥ 3
Meal Plan Macronutrients

- Carbohydrates (CHO)
  - 40-45% of calories (about 200-250 grams/day)
  - Minimum 175 g/day (provision of glucose for fetal brain and prevention of ketones)
  - Individualized for obese women, restriction of 35-40% of calories from CHO recommended
CHO Sources and Tips

- CHO food groups
  - Starches
  - Fruits
  - Milk and Yogurt
- Encourage whole food intake – avoid highly processed, refined, fruit juice
- Hidden sources of sugar
- Recommend skim or 1% milk, 4-8 ounces/meal or snack – may need to avoid at first meal
Possible Meal Plan CHO Distributions

- 210 g CHO

- 195 g CHO

- 180 g CHO
Meal Plan Macronutrients

- Protein
  - 0.8 g/kg/day preconception and 1\textsuperscript{st} half of pregnancy
  - 1.1 g/kg/day 2\textsuperscript{nd} half of pregnancy (+ 25 g/day)
  - RDA is 71 g/day
Protein Sources and Tips

- Protein food group
  - Meats, eggs, cheese, peanut butter
- Recommend protein at first meal of day
- Meat analogs usually contain some CHO
- Encourage low fat choices, natural peanut butter
Meal Plan Macronutrients

- **Fat**
  - Encourage monounsaturated fats
  - Less than 7% total calories from saturated fats
  - Less than 1% total calories from trans fats
Fat Sources and Tips

- Fat food group
  - Unsaturated
  - Saturated
- Encourage monounsaturated fats—canola oil, olive oil, olives, avocados
- Limit saturated fats—animal fat, palm and coconut oil
- Limit trans fats—baked products, cookies, chips
MNT Evaluation

- Problem solving
- Follow up
RD Should Evaluate:

- Inadequate weight gain or dietary intake
- Continuous weight loss
- Excessive weight gain
- Elevated fast or postprandial glucose values
- Other conditions
  - Type 1 or type 2
  - Eating disorder
  - Vegetarian
  - Obese or underweight
Follow Up

- Review food records and blood glucose values
- Weight
- Adjust meal plan as needed
- Review prevention and treatment of hypoglycemia
WIC-Approved Foods to Emphasize

- Frozen vegetables
- Brown basmati rice
- Original or plain soy milk
- Mozzarella cheese
- Grind your own peanut butter
- Plain oatmeal, Cheerios, All-Bran
- Tomato, other vegetable juice
Self Monitoring of Blood Glucose (SMBG)

- GDM, Type 1, Type 2 DM – recommend test blood glucose fasting, and 1 or 2 hours after meals
- 1 hour post prandial values most closely correlated with birth outcomes
- 1 hour often easier to remember and does not interfere with impact of snacks on blood glucose
Blood Glucose Goals

- Fasting and Pre-Meal: 60 – 110 mg/dl
  - 60 – 89 mg/dl
- 1 hour PP: 110 to < 155 mg/dl
  - 100 – 129 mg/dl
- 2 hour PP: <120 to <130 mg/dl
  - < 120 mg/dl
Medications Used

- Insulin – Regular, NPH most common; basal insulin (i.e. Lantus) and insulin analogs (i.e. Humalog) sometimes used
- Glyburide – Sulfonylurea that helps the pancreas release more insulin
- Glucophaghe/Metformin – helps liver make correct amount of glucose and cells use insulin more efficiently
Medication Precautions

- Insulin and Glyburide can cause hypoglycemia – instruct on s/s and treatment
  - Rule of 15
- Glucophage’s main side effect is GI disturbance; usually taken with meal(s) to reduced side effects
Post Partum Topics

- Insulin/Medication Needs
- Meal Plan for Breastfeeding, Weight Loss, etc.
- Contraception
- Testing for Type 2 DM
- Post Partum Depression Screen
- Pre Conception Counseling/Blood Glucose Control
Let’s continue to work collaboratively in making healthy moms and healthy babies our business!
Fun Food Fact
Americans eat enough peanut butter each year to cover the floor of the Grand Canyon!
Questions?