Nutritional Management
Gestational Diabetes Mellitus

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Objective

- To understand GDM, its physiology and screening

- Nutrition Therapy (NT)
Gestational Diabetes (GDM)

- “Any degree of glucose intolerance with onset or first recognition during pregnancy.”
  (WHO & ADA)

- The term GDM is not used for type 1 or type 2 DM diagnosed before conception or to the continuation of the diabetic state after the pregnancy is over.
Physiology

Risk Factors for Developing GDM

- Family history
- African American, American Indian, Asian American, Hispanic/Latino
- 25 years old+
- Overweight
- Previously had gestational diabetes
- Pre-diabetes
- Polycystic ovary syndrome
- Pregnancy-induced HTN (PIH)
Prevalence

- **Globally:**
  - 0.6 – 15% of all pregnancies (J Pak Med Assoc, 2009 July)
  - higher rates among some ethnic groups (Blacks, Hispanics & Asians)

- **Pakistan:**
  - 8% prevalence (Eur J Clin Nutr, 2007)
  - 4.19%
## Prevalence of GDM in Patients of Sir Syed Diabetic Clinic, 2005

<table>
<thead>
<tr>
<th>Variables</th>
<th>No of Patients</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total no of Pregnant Females</td>
<td>405</td>
<td>-</td>
</tr>
<tr>
<td>Number of females with abnormal 50gm glucose tolerance test</td>
<td>72</td>
<td>17.7</td>
</tr>
<tr>
<td>Pregnant females with abnormal 100gm OGTT</td>
<td>25</td>
<td>6.17</td>
</tr>
<tr>
<td>PF with normal 100gm OGTT</td>
<td>47</td>
<td>11.60</td>
</tr>
<tr>
<td>PF with GDM</td>
<td>17</td>
<td>4.19</td>
</tr>
<tr>
<td>PF with IGT</td>
<td>08</td>
<td>1.97</td>
</tr>
</tbody>
</table>
Effects on Mother

- 90% women become normoglycemic after pregnancy
- Increased risk of Type 2 DM (35-60%)*
- Hypertension
- Pre-eclampsia (HTN, proteinuria, edema)
- Cesarean Section

*(J Pak Med Assoc, 2009 July)*
Effects on Baby

- No physical deformities
- Hyperglycemia during pregnancy
- Hypoglycemia after pregnancy
- Macrosomia (wt = 8-9 lb)
- Breathing difficulties
- Jaundice
- Obesity risk increased
- Still birth
Screening

- All women should be screened for GDM between 24-28 weeks*
  - vs. risk factor based approach which can miss up to ½ the cases of GDM
  - Fasting blood glucose >126mg/dL or random blood glucose of 200mg/dL is indicative

- Women with multiple risk factors should be screened in the first trimester

*2012 Academy of Nutrition and Dietetics-Evidence Analysis Library (AND-EAL)
Role of Nutrition

- Body fat %, physical inactivity & diet quality are important modifiable risk factors for GDM. (Eur J Clin Nutr. 2007)

- The Dietitian should monitor
  - weight gain, nutritional intake and physical activity.

(2012 A.N.D-EAL)
Goals of NT

- To normalize fetal growth and birth weight
  - By controlling blood glucose levels
    1. intake of carbohydrates
    2. saturated fats

- Ensuring adequate nutrition without excessive weight gain
NT and You

- Initiate NT within one week after diagnosis
- Include a minimum of three nutrition visits

Research indicates that NT results in
  - improved maternal and neonatal outcomes, especially when diagnosed and treated early

(2012 A.N.D-EAL)
Steps of NT

- Assess
- Instruct
- Evaluate
Assess

- Weight History
- Physical Activity
- Current Food Habits & Preferences
Weight History

- Of previous pregnancies
- Weight fluctuations
- During and Prior to pregnancy
- Dietary habits
Weight Gain

Normal and Underweight Women

- Encourage adequate calories consumption to promote appropriate weight gain, with guidance from the Dietary Reference Intakes (DRI) for pregnant women.
Weight Gain

- Overweight/Obese Women
  - weight loss in pregnancy is not recommended
  - Encourage modest energy restriction
  - Caloric restriction
  - \(~70\%\) of the DRI for pregnant women

(2012 A.N.D-EAL)
Weight Gain Recommendations

<table>
<thead>
<tr>
<th>Weight for Height Category</th>
<th>Recommended Total Weight Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight (&lt;19.8)</td>
<td>28 - 40 lbs</td>
</tr>
<tr>
<td>Normal/Healthy Weight (19.8-26)</td>
<td>25 - 35 lbs</td>
</tr>
<tr>
<td>Overweight (26.1-29)</td>
<td>15 - 25 lbs</td>
</tr>
<tr>
<td>Obese (&gt;29)</td>
<td>15 lbs</td>
</tr>
<tr>
<td>Twin Gestation</td>
<td>35 – 45 lbs</td>
</tr>
<tr>
<td>Triplets</td>
<td>50 lbs</td>
</tr>
</tbody>
</table>

Physical Activity Assessment

- Type
- Duration
- Frequency
Diet Assessment

- Determine trends & preferences through 24 hr recall
- Prenatal vitamin intake
- Food allergies or intolerances
- Discuss cooking ability
- Determine food availability
Instruct

- Nutrient Balancing
- Meal Distribution
- Portion Sizes
- Weight Gain
- Physical Activity
Nutrient Balancing

- Carbohydrates:
  - understanding, choosing and counting

- Fat & Protein

- Vitamins and Minerals
Role of Carbohydrate

- Provision of glucose to the fetal brain and to prevent ketosis.
- CHO intake affects postprandial blood glucose levels;
  - ↑ postprandial blood glucose levels are associated with ↑ incidence of large-for-gestational age infants and ↑ rate of Cesarean sections.
- Research is limited regarding fiber intake and GI in women with GDM.

(2012 A.N.D-EAL)
Typical GDM Carbohydrate
(~35-40% of Energy)

<table>
<thead>
<tr>
<th>Meal</th>
<th>Grams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td>15-20</td>
</tr>
<tr>
<td>Morning snack</td>
<td>10-15</td>
</tr>
<tr>
<td>Lunch</td>
<td>45-60</td>
</tr>
<tr>
<td>Afternoon snack</td>
<td>10-15</td>
</tr>
<tr>
<td>Dinner</td>
<td>45-60</td>
</tr>
<tr>
<td>Night Snack</td>
<td>10-15</td>
</tr>
</tbody>
</table>
Meal Distribution

- Start with 175 grams* of carbohydrate
  - about 12 carbohydrate choices

- Distribute evenly throughout the day
  - Smaller, more frequent meals

- Watch timing:
  - 2 hours between meals
  - No more than 10-12 hours between last evening meal and morning meal

*2012 A.N.D-EAL
Break-fast

- Blood glucose elevated in the AM
- CHO foods less tolerated
- Limit to 15-30 g (1-2 carb choices)
- Choose items that contain protein over high-carb foods
- May need to avoid or limit fruit juice
- Monitor response to other typical breakfast foods
Artificial Sweeteners

- Inform them that only FDA-approved non-nutritive sweeteners should be consumed
- Moderation should be encouraged
- Research in this area is extremely limited

(2012 A.N.D-EAL)
Dietary Fat in GDM

- Choose food source which are lower in saturated and trans fats
- Increased polyunsaturated fat intake

(Diabetes Care, 2000 Apr)
Portion Control
Physical Activity

- Aim for 30 minutes/day, 3 days/week, if no contraindications
- Encourage exercising within one to two hours after a meal to improve glucose control
- Develop an individualized plan
- Ensure adequate hydration

(*2012 A.N.D-EAL)
Evaluate

- Weight Gain
- Food Record

and....
Evaluate

- Self Monitoring Blood Glucose
  - Fasting <95 mg/dl
  - 1 hour postprandial <130-140 mg/dl
  - 2 hour postprandial <120 mg/dl
  - Allow up to 2 weeks for BG levels to respond to nutrition therapy
  - Glucose intolerance increases as pregnancy progresses
Adjusting Meal Plan

- Consider response to certain foods and modify as needed

- Can test pre-meal and post-meal to determine if response is related to food eaten

- Do not restrict food intake to less than 12-18 kcal/kg/day in an attempt to avoid medication
GDM: Our responsibility

- Prevent the development of GDM per se

- Organize programs for reducing the incidence of type 2 DM in this high risk group  
  (J Pak Med Assoc, July 2009)

- BF improves glucose metabolism in mother and reduces risk of type 2 DM in child  
  (2012 A.N.D-EAL)
Thank You