

Gestational Diabetes Clinical Case Study

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Diabetes History

- ▶ Diabetes mellitus is a disease that has afflicted humans for centuries.
- ▶ More than 25.8 million adults and children in the United States have been diagnosed with diabetes.
- ▶ That is equivalent to 8.3% of our population.¹



Diabetes

- ▶ The name diabetes mellitus has its roots in both the Greek and Latin languages.
- ▶ Diabetes, a Greek word, means to siphon in a continual flow.
- ▶ Mellitus has Latin origins and refers to the honey or sweet urine of diabetics.
- ▶ High blood sugar or hyperglycemia (generally, blood glucose levels >180 ml/dL) causes the urine of diabetic individuals to be high in glucose.⁶



Classifications of Diabetes

- ▶ The four clinical classes of diabetes are:
- ▶ Type 1
- ▶ Type 2
- ▶ Gestational
- ▶ Other specific types of diabetes caused by genetic defects ³⁻⁵



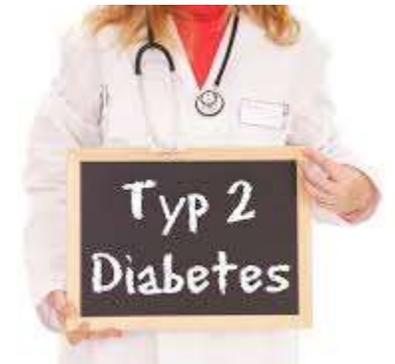
Type 1 Diabetes

- ▶ Type 1 Diabetes or insulin dependent diabetes is caused by an autoimmune process in which the body's immune system attacks the beta cells where insulin is produced within the pancreas.
- ▶ In type 1 diabetes, no insulin is produced and daily insulin injections are required to maintain normal blood glucose levels.
- ▶ Type 1 diabetes typically manifests in children and is usually apparent by the age of 14.



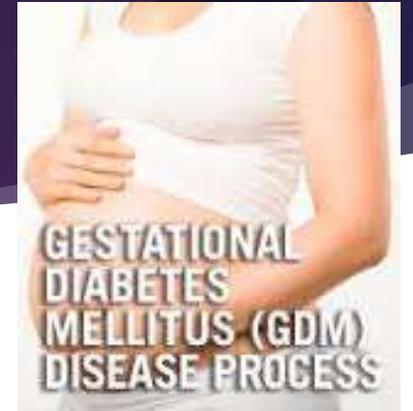
Type 2 Diabetes

- ▶ Type 2 diabetes is also known as insulin resistant diabetes or adult onset diabetes
- ▶ Type 2 is the most common type of diabetes, comprising 90-95% of diabetes diagnoses. Insulin is still produced by the pancreas in cases of type 2 diabetes.
- ▶ Cells require more insulin than is being produced or the cells no longer respond normally to the insulin being produced.
- ▶ Lifestyle factors including diet, lack of exercise, obesity, and family history of diabetes are all predictors of the onset of type 2 diabetes.²



Gestational Diabetes

- ▶ Gestational diabetes occurs when the initial manifestation of diabetes occurs during pregnancy.
- ▶ Approximately 5% of pregnant women in the U.S. develop gestational diabetes.
- ▶ Women diagnosed with gestational diabetes have a greater risk of developing type 2 diabetes later on in life.
- ▶ The disease process of gestational diabetes is similar to type 2 diabetes.
- ▶ Blood sugar levels usually return to normal after giving birth.³



Gestational Diabetes

- ▶ Current guidelines call for the use of screening criteria that are used to assess pregnant women to determine who may be at higher risk for the onset of gestational diabetes.
- ▶ The testing recommendations for GDM include a low risk group, a high risk group and an average risk group.

Low Risk Category

- ▶ Expectant mothers must meet the following criteria to be considered at a low risk for developing GDM:
 - ▶ Be less than 25 years old
 - ▶ Have a normal BMI before becoming pregnant
 - ▶ Have no first degree relatives diagnosed with diabetes
 - ▶ Have no history of abnormal glucose tolerance
 - ▶ No past history of poor obstetric outcome
 - ▶ Not belong to an ethnic group with a high prevalence of diabetes
- ▶ Pregnant women who fall within the low risk group require no glucose testing

High Risk Category

- ▶ Criteria for inclusion in the high risk group:
 - ▶ Women with any of the following risk factors:
 - ▶ Obesity
 - ▶ History of GDM
 - ▶ Glycosuria
 - ▶ A family history of diabetes
- ▶ Women in the high risk group require fasting plasma glucose or casual plasma glucose as soon as is possible, with retesting recommended at 24 and 28 weeks gestation if the first screening was negative for GDM

Average Risk

- ▶ An expectant mother is categorized in the average risk group if she does not meet the criteria outlined in the low risk or high risk groups
- ▶ Women categorized in the average risk group should be tested between 24 and 28 weeks gestation

Testing



- ▶ When it is necessary to test glucose between 24 and 28 weeks gestation one of two approaches may be used.
- ▶ The first is a one-step approach where a diagnostic 100-g OGTT (oral glucose tolerance test) is administered.
- ▶ The second is a two-step approach
- ▶ In the first step an initial screening using a glucose challenge test with a 50-g oral glucose load is performed
- ▶ Next, a diagnostic 100-g OGTT is performed on those women exceeding the glucose threshold value on the initial glucose challenge test

Diagnosis

- ▶ A fasting plasma glucose of greater than 126 mg/dL or casual plasma glucose of greater than 200 mg/dL meets the threshold for a gestational diabetes diagnosis
- ▶ To validate the initial diagnosis, a confirming diagnosis must be made on the day following the initial test, thereby leaving no doubt about the validity of the initial diagnosis of hyperglycemia.⁷



Carpenter and Coustan Diagnostic Criteria

- ▶ The American Diabetic Association recommends using the Carpenter and Coustan diagnostic guidelines for abnormal glucose tolerance.⁷

Carpenter and Coustan Diagnostic Criteria for Detection and Diagnosis of Gestational Diabetes⁷

Plasma glucose	50-g Glucose Challenge Test	100-g Diagnostic OGTT
Fasting	---	95 mg/dL
1 Hour	140 mg/dL	180 mg/dL
2 Hour	---	155 mg/dL
3 Hour	---	140 mg/dL

Additional Testing Criteria

- ▶ For a positive diagnosis of gestational diabetes two or more of the listed plasma glucose values must be met or exceeded
- ▶ The test must be administered after an overnight fast of at least 8-14 hours.
- ▶ During the 3 days prior to testing, the patient must have been consuming an unrestricted diet of at least 150 grams of carbohydrate per day
- ▶ The patient must have had unlimited physical activity on the 3 days before the test is administered
- ▶ During the test the patient must limit physical activity by remaining seated quietly. Any excess physical activity can alter the test results.⁷

Patient History

- ▶ Patient A.C. is a 36 year old female 28 weeks pregnant.
- ▶ AC is an RN who was recently diagnosed with gestational diabetes.

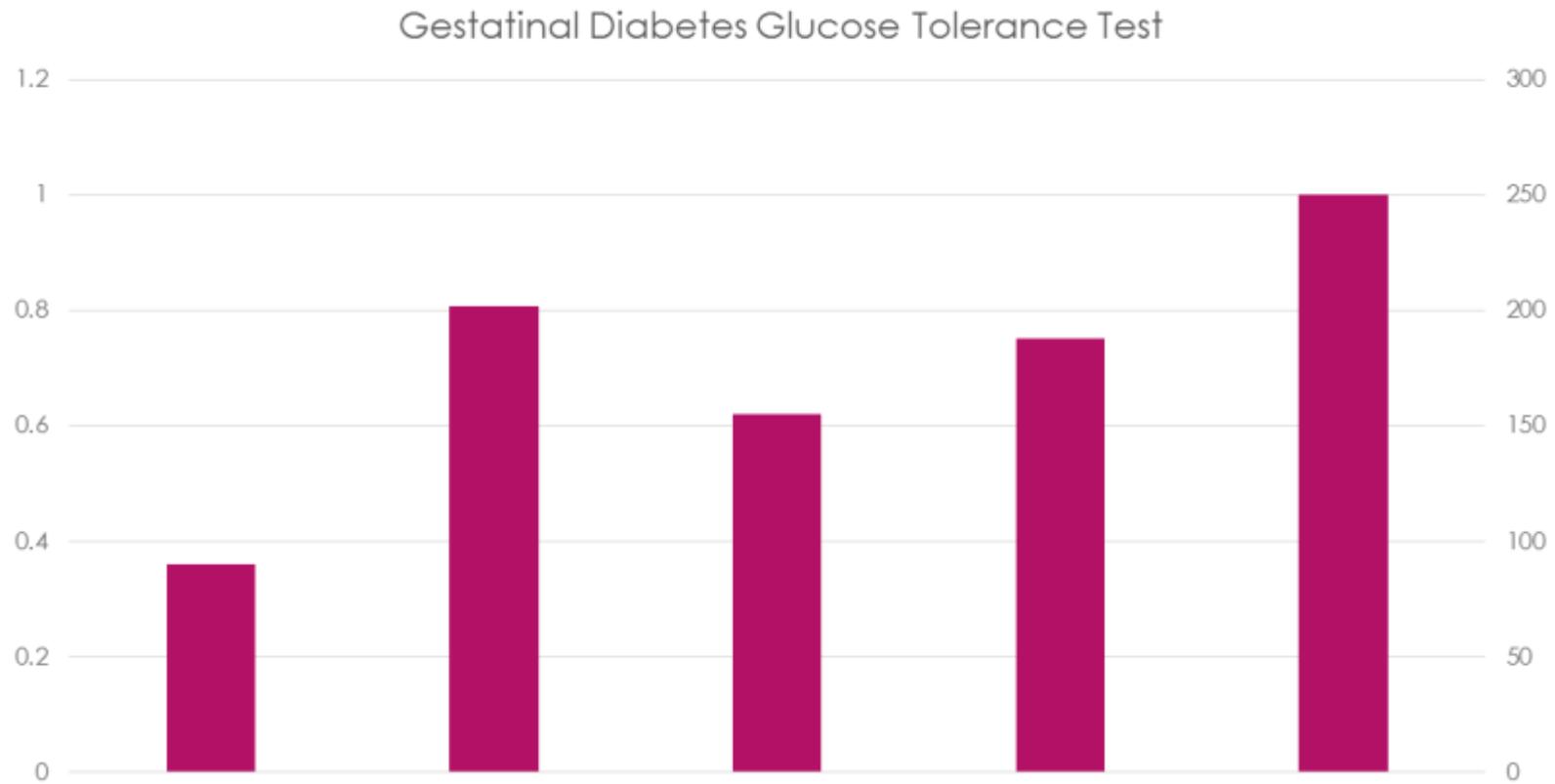
Pertinent Labs

Test Name	Result
WBC	1.0
RBC	3.66
Hgb	11.9 L
Hct	34.0 L
MCV	92.9
MCH	32.4

MCHC	34.9
RDW	13.1
Plt Count	18.7
Differential Method	AUTOMATED
Neutrophils %	80.1 H
Lymphocytes %	10.8 L
Monocytes %	7.0
Eosinophils #	1.7
Basophils %	0.4

Lymphocytes #	1.1
Eosinophils #	0.20
RBC Morphology	Normal
Hemoglobin A1	97.2
Hemoglobin A2	2.8
Hemoglobin C	0.0
Hemoglobin F (Fetal)	0.0
Hemoglobin S	0.0

Glucose Tolerance Test Results



Nutrition Assessment Data

- ▶ **Nutrition Assessment Data**
- ▶ **Height:** 5'6"
- ▶ **Weight:** 179 lbs. (81 kg); Pre-pregnancy weight = 155 lbs (71 kg)
- ▶ **Weight Gain During Pregnancy:** 24 pounds (11 kg)
- ▶ **BMI:** 28.9
- ▶ **Ideal Body Weight:** 130 lbs (pre-pregnancy), 154 lbs 28 weeks gestation
- ▶ **Estimated Energy Requirements:** 25-30 kcals/kg body weight = 2025-2430 kcal/day
- ▶ **Estimated Protein Requirements:** 1.2-1.5 grams protein/Kg = 30-122 gm pro/day
- ▶ **Estimated Fluid Requirements:** 1 mL per kcal = 2025-2430 mL/day



Comments

- ▶ **Comments:** Patient seen in outpatient dietitian's office. Discussed gestational diabetes, carbohydrate counting with food list examples, high fiber, low sodium, lean proteins, healthy fats, label reading tips, meal planning, dining out and general nutrition. Provided patient with gestational diabetes nutrition therapy handout with a sample menu.⁸ Patient works the night shift as a nurse at Holy Cross Hospital. Patient states that she will adhere to gestational diabetes nutrition therapy dietary recommendations to help control her blood glucose levels.

Nutrition Care Process

- ▶ **Nutrition Diagnosis:** Food and nutrition related knowledge deficit
- ▶ **Related to:** Lack of previous information
- ▶ **As Evidenced By:** Patient's statements
- ▶ **Patient Education Topics:** Carbohydrate counting, meal planning and general nutrition.
- ▶ **Intervention:** Gestational Diabetes nutrition therapy education provided
- ▶ **Nutrition Goals:** Patient will choose appropriate foods based upon dietary needs
- ▶ **Monitoring and Evaluation:** Follow up as needed



References

1. American Diabetes Association. Diabetes Statistics. 2011. <http://www.diabetes.org/diabetes-basics/diabetes-statistics/>
2. Center for Disease Control and Prevention. 2011 National Diabetes Fact Sheet. 2011. <http://www.cdc.gov/diabetes/pubs/factsheet11>
3. Expert Committee on the Diagnosis and Classification of Diabetes Mellitus. Report of the expert committee on the diagnosis and classification of diabetes mellitus. *Diabetes Care* 1997;20:1183-1197.
4. Expert committee on the diagnosis and classification of diabetes mellitus. Follow up report on the diagnosis of diabetes mellitus. *Diabetes Care* 2003;26:3160-3167.
5. American Diabetes Association. Clinical Practice Recommendations. *Diabetes Care* 2006;29 (Suppl 1):S4-42.
6. U.S. Department of Health and Human Services. National Diabetes Information Clearinghouse. 2008. <http://www.diabetes.niddk.nih.gov/dm/pubs/>
7. Carpenter MW, Coustan DR. Criteria for screening test for gestational diabetes. *Am J Obstet Gynecol* 1982;144:768-773.
8. *Academy of Nutrition and Dietetics*. Gestational Diabetes Nutrition Therapy from the Nutrition Care Manual.