

Advances in the diagnosis and management of gestational diabetes mellitus.

Estrella Herminia*

Department of Obstetrics Gynecology, Philippine General Hospital, Manila, Philippines

Introduction

Gestational Diabetes Mellitus (GDM) is a form of diabetes that occurs during pregnancy and can impact both maternal and fetal health. This comprehensive review covers the pathophysiology, diagnostic criteria and management strategies for GDM, with a focus on recent advancements in treatment and prevention. The article aims to provide a thorough understanding of GDM to improve outcomes for both mothers and their infants.

Gestational Diabetes Mellitus (GDM) is characterized by glucose intolerance that begins or is first recognized during pregnancy. GDM affects approximately 2%-10% of pregnancies worldwide and poses significant risks to both maternal and neonatal health. Understanding the underlying mechanisms, accurate diagnosis and effective management strategies is crucial for mitigating these risks and improving pregnancy outcomes.

Pathophysiology of gestational diabetes

The development of GDM is associated with insulin resistance and impaired insulin secretion during pregnancy.

Insulin resistance

Placental hormones: Hormones produced by the placenta, such as human placental lactogen and cortisol, can antagonize insulin action, leading to insulin resistance.

Increased insulin demand: The growing placenta and fetus require higher levels of insulin, which may overwhelm the pancreatic β -cells' ability to secrete sufficient insulin.

Impaired insulin secretion

β -cell dysfunction: The pancreatic β -cells may fail to increase insulin production appropriately in response to insulin resistance, leading to hyperglycemia.

Genetic factors: Genetic predisposition can influence the risk of developing GDM, with certain gene variants affecting insulin sensitivity and secretion.

Risk factors

Obesity: Excessive maternal weight is a significant risk factor for GDM.

Age: Advanced maternal age increases the risk of developing GDM.

Ethnicity: Certain ethnic groups, such as African, American, Hispanic and Asian, have a higher prevalence of GDM.

Family history: A family history of diabetes increases the risk of GDM.

Diagnostic criteria for gestational diabetes

Accurate diagnosis of GDM is essential for effective management and prevention of complications.

Screening

Glucose Challenge Test (GCT): Typically performed between 24 and 28 weeks of gestation, this test involves ingesting a glucose solution and measuring blood glucose levels after one hour. A result ≥ 140 mg/dL may indicate the need for further testing.

Oral Glucose Tolerance Test (OGTT): If the GCT result is abnormal, an OGTT is conducted to confirm the diagnosis. The patient fasts overnight and consumes a glucose solution, with blood glucose levels measured at fasting, one hour and two hours.

Diagnostic criteria (based on the American Diabetes Association guidelines):

- Fasting glucose: ≥ 92 mg/dL
- 1-hour postprandial glucose: ≥ 180 mg/dL
- 2-hour postprandial glucose: ≥ 153 mg/dL

Management strategies for gestational diabetes

Effective management of GDM involves a combination of lifestyle modifications, glucose monitoring and medical interventions.

Lifestyle modifications

Diet: A balanced diet with controlled carbohydrate intake is essential. Nutritional counseling can help manage blood glucose levels and ensure adequate fetal growth.

Exercise: Regular physical activity, such as walking or prenatal exercise classes, improves insulin sensitivity and helps control blood glucose levels.

Glucose monitoring

Self-monitoring: Regular self-monitoring of blood glucose levels helps track the effectiveness of dietary and lifestyle interventions and informs necessary adjustments.

*Correspondence to: Estrella Herminia, Department of Obstetrics Gynecology, Philippine General Hospital, Manila, Philippines, E-mail: herminia@yahoo.com

Received: 20-Jul-2024, Manuscript No. AAGGS-24-142624; Editor assigned: 23-Jul-2024, AAGGS-24-142624 (PQ); Reviewed: 06-Aug-2024, QC No. AAGGS-24-142624; Revised: 13-Apr-2025, Manuscript No. AAGGS-24-142624 (R); Published: 20-Apr-2025, DOI: 10.35841/AAGGS.9.2.255

Citation: Herminia E. Advances in the diagnosis and management of gestational diabetes mellitus. *Gynecol Reprod Endocrinol*. 2025;9(2):255

Continuous Glucose Monitoring (CGM): CGM devices provide real-time glucose measurements and can be beneficial for managing blood glucose levels more effectively.

Medical interventions

Insulin therapy: If lifestyle modifications are insufficient to control blood glucose levels, insulin therapy may be required. Insulin is considered safe for both the mother and the fetus.

Oral hypoglycemic agents: Medications such as metformin and glyburide may be used as alternatives to insulin in some cases, although their use during pregnancy requires careful consideration.

Monitoring and follow-up

Fetal monitoring: Regular ultrasounds and non-stress tests assess fetal growth and well-being. Monitoring helps detect potential complications, such as macrosomia or oligohydramnios.

Postpartum care: Women with GDM should have their glucose levels monitored postpartum, as they are at increased risk of developing type 2 diabetes in the future.

Complications associated with gestational diabetes

GDM can lead to various complications for both the mother and the infant.

Maternal complications

Pre-eclampsia: Women with GDM are at higher risk for pre-eclampsia, a condition characterized by high blood pressure and proteinuria.

Increased risk of type 2 diabetes: Women with GDM have a greater risk of developing type 2 diabetes later in life.

Fetal complications

Macrosomia: Excessive fetal growth due to high maternal blood glucose levels can lead to macrosomia, increasing the risk of shoulder dystocia and cesarean delivery.

Neonatal hypoglycemia: Newborns of mothers with GDM may experience hypoglycemia shortly after birth, requiring monitoring and treatment.

Respiratory distress syndrome: Babies born to mothers with GDM are at increased risk of respiratory complications.

Prevention of gestational diabetes

Preventing GDM involves addressing modifiable risk factors and implementing lifestyle changes before and during pregnancy.

Preconception counseling

Weight management: Achieving a healthy weight before pregnancy can reduce the risk of developing GDM.

Healthy lifestyle: Adopting a balanced diet and regular exercise regimen before conception can improve insulin sensitivity and reduce risk.

Early screening and intervention

Risk assessment: Identifying women at high risk for GDM early in pregnancy allows for timely screening and intervention.

Education: Providing education on lifestyle modifications and glucose monitoring can help prevent or manage GDM effectively.

Conclusion

Gestational diabetes mellitus is a significant condition that requires careful management to ensure positive outcomes for both mother and child. Understanding its pathophysiology, accurate diagnosis and effective management strategies are essential for mitigating risks and improving overall health. Advances in treatment and preventive measures offer hope for reducing the incidence and impact of GDM, ultimately enhancing maternal and neonatal well-being.

Citation: Herminia E. *Advances in the diagnosis and management of gestational diabetes mellitus.* *Gynecol Reprod Endocrinol.* 2025;9(2):255