CHAPTER 4

GESTATIONAL DIABETES MELLITUS

Khalid Imam
Diabetes and Endocrinology Section, Liaquat National Hospital and Medical College, Karachi, Pakistan
Email: docimam@yahoo.com

Abstract: Gestational diabetes mellitus is one of the most common medical problems that results from an increase in the insulin resistance as well as an impairment of the compensatory increase in insulin secretion from the β cells of the pancreas. It serves as a metabolic stress test that uncovers underlying insulin resistance and β-cell dysfunction. Gestational diabetes is associated with a variety of maternal and fetal complications, most notably macrosomia. Controversy surrounds the ideal approach for detecting gestational diabetes, and the approaches recommended for screening and diagnosis are largely based on expert opinion. Controlling maternal glycemia with Medical Nutrition Therapy, close monitoring of blood glucose levels and treatment with insulin if blood glucose levels are not at goal has been shown to decrease fetal and maternal morbidities. Other treatment modalities, such as oral agents, need further study to validate their safety and efficacy. Finally, postpartum management of women with Gestational diabetes is critical because of their markedly increased risk of Type 2 diabetes in the future. Efforts should be made to prevent gestational diabetes in subsequent pregnancies. Because body fat and diet contribute to the risk of gestational diabetes mellitus, patients who lose weight before pregnancy and follow an appropriate diet may lower their risk of gestational diabetes mellitus.

INTRODUCTION

Gestational diabetes mellitus (GDM) is defined as glucose intolerance that is first detected during the pregnancy and is associated with a probable resolution after the end of the pregnancy. Gestational diabetes is one of the commonest medical conditions affecting ~7% of all pregnancies.1-3 The prevalence may range from 1 to 14% of all pregnancies, depending on the population studied and the diagnostic tests employed. GDM accounts for ~90% of all cases complicated by diabetes.

Diabetes: An Old Disease, a New Insight, edited by Shamim I. Ahmad.

24
PATHOGENESIS

Human placental lactogen plays a pivotal role in triggering the changes that can lead to glucose intolerance. It has strong anti-insulin and lipolytic effects. Peripheral insulin sensitivity during the third trimester decreases to 50% of that seen in the first trimester and basal hepatic glucose output is 30% higher despite higher insulin levels. Levels of anti-insulin placental steroid and peptide hormones (e.g., estrogens, progesterone) rise linearly throughout the second and third trimesters. Because these hormones confer increasing tissue insulin resistance as their levels rise, the demand for increased insulin secretion with feeding escalates progressively during pregnancy. If the maternal pancreatic insulin response is inadequate, maternal and then fetal hyperglycemia results. This typically manifests as recurrent postprandial hyperglycemic episodes. These postprandial episodes are most significantly accountable for the accelerated growth exhibited by the fetus. Maternal and fetal glucose levels are accompanied by episodic fetal hyperinsulinemia. Fetal hyperinsulinemia promotes excess nutrient storage, resulting in macrosomia. The energy expenditure associated with the conversion of excess glucose into fat causes depletion in fetal oxygen levels. These episodes of fetal hypoxia are accompanied by surges in adrenal catecholamines, which, in turn, cause hypertension, cardiac remodeling and hypertrophy, stimulation of erythropoietin, red cell hyperplasia, and increased hematocrit.

HIGH RISK FACTORS FOR GDM

This category includes the subjects bearing at least one of the following risk factors:

- Obesity
- History of diabetes in first degree relatives
- Prior history of GDM or prediabetes
- Prior delivery of macrosomic Infant (weighing > 4 kg)
- Current glycosuria
- Ethnic Groups such as South Asians, Pima Indians.

A case-control study indicated that another risk factor for the development of gestational diabetes is the presence of hypertension before pregnancy or during early pregnancy.

LOW RISK FACTORS FOR GDM

This category includes the subjects bearing all of the following risk factors:

- Age < 25 years
- No history of diabetes in family
- Normal prepregnancy weight
- No prior history of abnormal glucose tolerance (prediabetes)
- No prior poor obstetrical outcome.

Intermediate category includes those who neither fall into high or low risk categories.