



# Gestational Diabetes Mellitus: Pathophysiology and Risk Factors



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## Introduction

Prevalence of gestational diabetes mellitus (GDM) is increasing among pregnant women worldwide. Understanding of GDM pathophysiology and risk factors is helpful to prevent its complications. Known risk factors of GDM are genetic and unhealthy behaviors. Genetic risk factor is associated with pancreatic beta cell dysfunction and impaired carbohydrate and fat metabolism. In addition, unhealthy behaviors including dietary pattern and lack of exercise are known to promote development of diabetes. Overeating of unhealthy diet causes obesity, insulin resistance, and endothelial cell dysfunction. Food containing high sugar, fructose corn syrup, trans fat and advanced glycation end products (AGEs) are associated with insulin resistance and impaired insulin signaling. As a result, elevated of blood glucose glycated hemoglobin, and dyslipidemia occur [1]. Moreover, reduction of adipokines secreting from adipose tissue is associated with insulin resistance, imbalance of glucose production, dysfunction of lipid metabolism, development of atherosclerosis and diabetes.

Moreover, lack of regular exercise lead to accumulation of adipose tissue and visceral fat that suppress insulin sensitivity. Reduction in cellular uptake of glucose results in enlargement adipocyte and adipose tissue promoting insulin resistance. During pregnancy, diabetogenic effect occurs in order to preserve plasma glucose for fetal development. Human placental lactogen, cortisol, estrogen, progesterone, and insulinase work as insulin antagonist [2]. Therefore, beta cells in the pancreas produce more insulin. However, women with overweight and obesity cannot excrete sufficient insulin because of prior insulin resistance. They are more likely to develop GDM during the second trimester of pregnancy. Manifestation of pathophysiology of GDM among pregnant women is associated with degree of insulin resistance and endothelial cell dysfunction [3].

Prolonged insulin resistance leads to hyperinsulinemia state and vascular damage both macrovascular and microvascular

resulting in reduction of placental blood flow. As a result, pregnancy complicated with GDM is often affected with abortion, preterm labor, and hypertensive disorders [4,5]. Research evidence shows that elevated of triglycerides increases risk for development of preeclampsia among pregnant women with GDM. Newborn complications are large fetus, malformation, or dead fetus. Neonatal hypoglycemia is common among infants born to mothers with GDM. Knowing of GDM risk factors and pathophysiology is useful to prevent its complications [6]. Reproductive women should be advised to prevent GDM by empowering of healthy nutrition and doing regular exercise. Promotion of consumption of food rich in protein, iron, folate, and antioxidant compounds should be the focus. Avoiding of food containing high sugar and trans fat should be promoted in order to reduce insulin resistance and endothelial cell damage.

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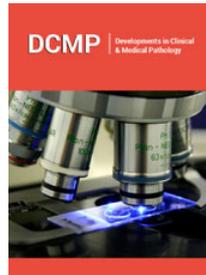
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