



## Overview on Gestational Diabetes Mellitus

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### ABSTRACT

Gestational diabetes mellitus which develops during pregnancy is usually diagnosed in the 24th to 28th week of pregnancy. It is the most common complication of pregnancy and type of diabetes during pregnancy. Approximately 14% of pregnancies worldwide are affected with GDM. The women without previously diagnosed diabetes tends to develop chronic hyperglycemia during gestation. In most cases, this result due to of impaired glucose tolerance due to pancreatic  $\beta$ -cell dysfunction and development of insulin resistance. Risk factors for GDM mainly include obesity, advanced maternal age, and a family history or any form of diabetes. Various consequences of GDM include increased risk of maternal cardiovascular disease and type 2 diabetes and macrosomia and birth complications in the infant. There is also a longer-term risk of obesity, type 2 diabetes, and cardiovascular disease in the child.

**Keywords:** Gestational diabetes mellitus, pregnancy, physiology, insulin.

### INTRODUCTION

Gestational diabetes mellitus (GDM) is defined as a degree of glucose intolerance with an onset or first recognition during pregnancy. It is diagnosed in the second or third trimester of pregnancy. Gestational diabetes is increasing in prevalence coincidentally with the dramatic increase in the prevalence of overweight and obesity in women of childbearing age. It is a global health concern, not only because its prevalence is high but also because leads to potential implications for mothers and their infant. It affects up to 14 % of all pregnancies. GDM carries a risk for both the mother and child and is associated with serious short- and long-term consequences. Mother's with GDM are at risk of developing gestational hypertension, preeclampsia and caesarean section. Apart from this, women with a history of GDM are also at significantly higher risk of developing subsequent type 2 diabetes mellitus (T2DM) and cardiovascular diseases<sup>1</sup>. Babies born from GDM women are at risk of being macrosomic, may suffer from more congenital abnormalities and have a greater propensity of developing neonatal hypoglycaemia. GDM is a condition in which a hormone made by the placenta prevents the body from using insulin effectively. Glucose builds up in the blood instead of being absorbed by the cells. Unlike type 1 diabetes, gestational diabetes is not caused by a lack of insulin, but by other placental hormones produced during pregnancy that makes insulin less effective, a condition referred to as insulin resistance. Gestational diabetic symptoms disappear following delivery<sup>2</sup>.

### Symptoms of GDM<sup>3</sup>

- ✓ Sugar in urine

- ✓ Unusual thirst.
- ✓ Frequent urination.
- ✓ Fatigue.
- ✓ Nausea.
- ✓ Frequent vaginal, bladder, and skin infections.
- ✓ Blurred vision

### Pathophysiological of GDM<sup>4</sup>

During pregnancy, the mother's body undergoes a series of physiological changes in order to support the demands of the growing fetus. These include adaptations to the cardiovascular, renal, hematologic, respiratory, and metabolic systems. One important metabolic adaptation is in insulin sensitivity. Over the course of gestation, insulin sensitivity shifts depending on the requirements of pregnancy. During early gestation, insulin sensitivity increases, promoting the uptake of glucose into adipose stores in preparation for the energy demands of later pregnancy<sup>5</sup>. However, as pregnancy progresses, a surge of local and placental hormones, including estrogen, progesterone, leptin, cortisol, placental lactogen, and placental growth hormone together promote a state of insulin resistance<sup>6</sup>. As a result, blood glucose is slightly elevated, and this glucose is readily transported across the placenta to fuel the growth of the fetus. This mild state of insulin resistance also promotes endogenous glucose production and the breakdown of fat stores, resulting in a further increase in blood glucose and free fatty acid (FFA) concentrations, further resulting in GDM<sup>7</sup>.

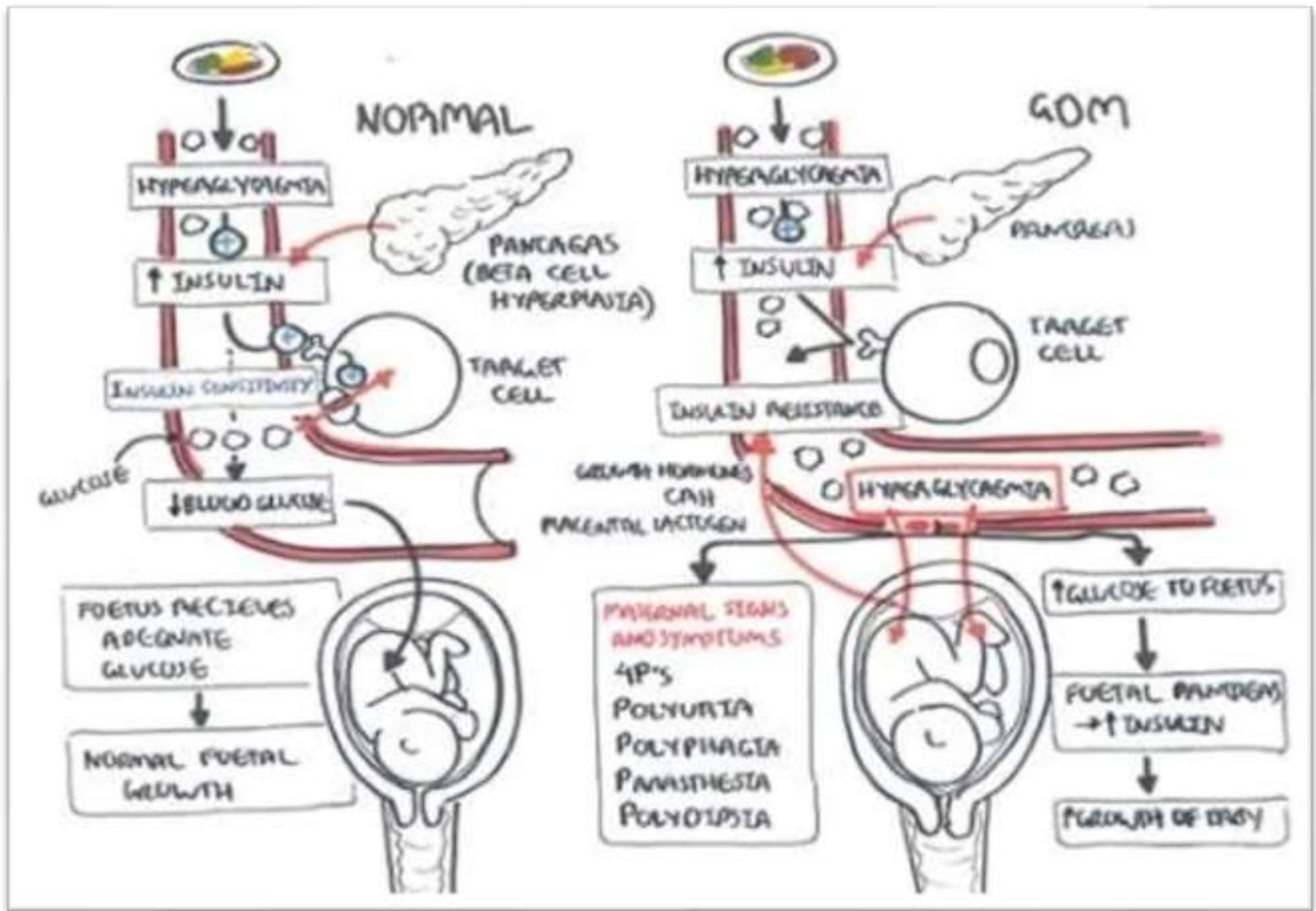


Figure 1: Pathophysiology of Gestational diabetes

**Maternal Complications<sup>8</sup>**

- ✓ Polyhydramnios
- ✓ Infections
- ✓ Risk of preeclampsia
- ✓ Ketoacidosis
- ✓ Worsening of nephropathy and retinopathy in cases of pre existing diabetes
- ✓ Maternal distress due to polyhydramnios
- ✓ Preterm labour
- ✓ Labour complications like increased birth trauma
- ✓ Puerperal complications like sepsis and lactation failure.

**Fetal Complications<sup>9</sup>**

- ✓ Macrosomia
- ✓ Respiratory distress
- ✓ Intra-uterine growth restriction
- ✓ Intra-uterine fetal demise
- ✓ Congenital malformations

**Neonatal Complications<sup>10</sup>**

- ✓ Hypoglycemia
- ✓ Respiratory distress syndrome
- ✓ Hyperbilirubinemia
- ✓ Polycythemia
- ✓ Hypocalcemia
- ✓ Hypomagnesemia
- ✓ Cardiomyopathy

**Long-term Effects<sup>11</sup>**

- ✓ Childhood obesity
- ✓ Neuropsychological effects
- ✓ Risk of type 2 DM
- ✓ Risk of metabolic syndrome
- ✓ The complications arising in GDM is mostly preventable if adequate control of blood sugar levels are maintained throughout the pregnancy.

**Diagnosis<sup>12-13</sup>**

All pregnant women should be screened for glucose intolerance since selective screening based on clinical attributes or past obstetrical history has been shown to be

inadequate. A number of studies indicate that screening only those patients with positive risk factors would result in approximately 50% of all patients with gestational diabetes mellitus being missed. Screening at 24-28 weeks of gestation. It is done with fasting blood glucose or with OGTT (oral glucose tolerance test). The OGTT measures blood glucose after you fast for at least 8 hours. Health care professional will draw blood to measure blood glucose levels during fasting. Then they insist to drink the liquid containing glucose and blood is drawn every hour for 2 to 3 hours to diagnose gestational diabetes. Abnormal blood values for a 2-hour 75-gram oral glucose tolerance test are:

**Fasting:** greater than 92 mg/dL (5.1 mmol/L)

**1 hour:** greater than 180 mg/dL (10.0 mmol/L)

**2 hour:** greater than 153 mg/dL (8.5 mmol/L)

If blood glucose results in the OGTT is higher than normal, it indicates gestational diabetes.

#### Treatment

The women diagnosed with GDM is kept for dietary counseling in combination with physical activity and self-monitoring of blood glucose. If these measures are insufficient in terms of achieving optimal glycemic control subcutaneous insulin therapy is the choice as insulin does not cross the placenta and is therefore considered harmless to the foetus. However, insulin is relatively expensive and difficult to administer. It requires education to ensure a safe administration and it is associated with an increased risk of hypoglycemia and weight gain. The use of safe and effective oral agents such as Metformin may therefore offer advantages over insulin<sup>14-15</sup>.

#### CONCLUSION

Pregnancy is a state of high metabolic activity, in which maintaining glucose homeostasis is of upmost importance. A prevalence of GDM was higher in the elderly multiparous females who were overweight and had family history of diabetes mellitus. Early screening of pregnant females gives an early diagnosis of GDM. As it avoids many complications both in mother and infant.

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