

Pregestational Diabetes in Pregnancy



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KEYWORDS

• Pregestational diabetes • Pregnancy • Pregnancy outcomes • Preconception care

KEY POINTS

- Pregestational diabetes affects 1% to 2% of pregnancies in the United States.
- Poor diabetes control is associated with both maternal and fetal adverse outcomes.
- Optimization of glucose control with intensive self-monitoring of blood glucose, lifestyle management, and pharmacologic therapy preconception and throughout pregnancy reduces risk of developing these outcomes.

INTRODUCTION

In the last 30 years, the prevalence of diabetes mellitus in women of childbearing age has grown. Much of this is attributable to the obesity epidemic, which estimates suggest will worsen over the next decade.¹ Pregestational diabetes mellitus (PDM) now affects 1% to 2% of pregnancies in the United States, and its prevalence continues to grow. Since the 1990s, PDM has increased significantly in across all age groups, ethnicities, and geographies in the United States and Canada (**Fig. 1**).^{2–4} Rates of both type 1 diabetes mellitus (T1DM) and type 2 diabetes mellitus (T2DM) continue to increase,⁵ of whom more than 20% are undiagnosed.⁶

Glucose Metabolism in Pregnancy

In women with normal carbohydrate metabolism, first-trimester fasting blood glucose levels are lower than at baseline due to estrogen-mediated increases in both insulin sensitivity and insulin production.⁷ In the second and third trimesters, fasting blood glucose increases as hepatic glucose production increases and insulin sensitivity decreases.⁸ Placental hormones, including human placental lactogen and progesterone,

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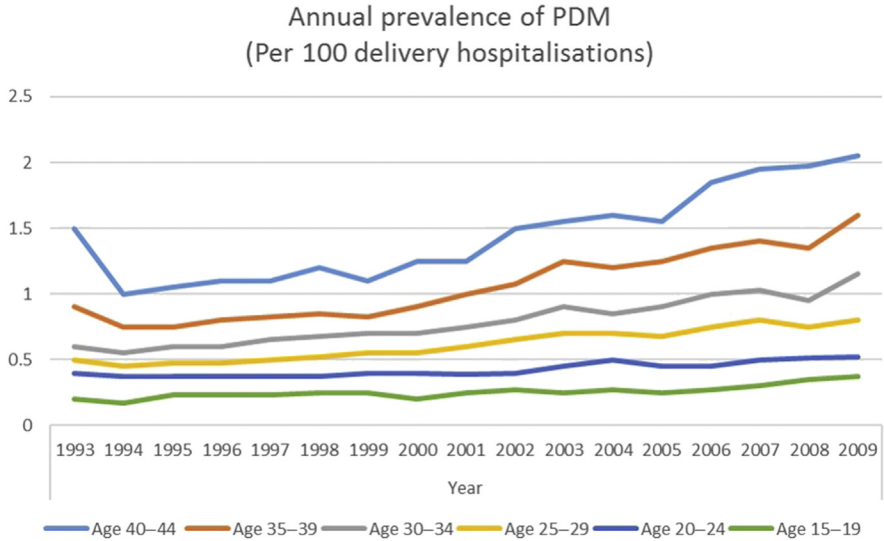


Fig. 1. Annual prevalence of pregestational diabetes in the United States. (Adapted from Fig. 2, Correa A, Bardenheier B, Elixhauser A, et al. Trends in prevalence of diabetes among delivery hospitalizations, United States, 1993-2009. *Matern Child Health J* 2015;19(3):635-42; with permission.)

also increase peripheral insulin resistance.⁹ In women with normal pancreatic function, increased insulin secretion is sufficient to overcome physiologic insulin resistance and maintain normal blood glucose (Fig. 2).¹⁰

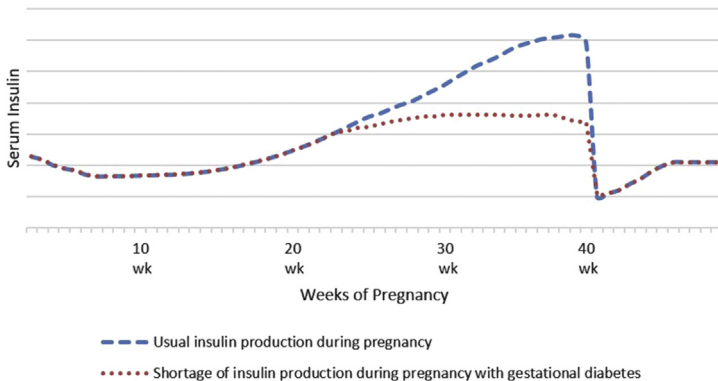


Fig. 2. Insulin requirements during pregnancy. (Data from Catalano PM, Tyzbir ED, Roman NM, et al. Longitudinal changes in insulin release and insulin resistance in nonobese pregnant women. *Am J Obstet Gynecol* 1991;165(6 Pt 1):1667-72.)

Classification

Diabetes mellitus is a syndrome of impaired glucose metabolism due to reduced or absent pancreatic insulin secretion, abnormal peripheral insulin sensitivity, or both.¹¹ According to the American Diabetes Association (ADA), the criteria for diagnosis of diabetes include the following¹¹:

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