

## Insulin Secretory Status and Insulin Indices after 5 years of Index Pregnancy with Gestational Diabetes Mellitus

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### Abstract

**Background:** Women with a previous history of Gestational Diabetes Mellitus (GDM) have a higher risk of developing adverse metabolic outcomes in comparison to women without GDM. Although after delivery dysglycemia usually subsides, insulin resistance and  $\beta$ -cell defects may not disappear completely postpartum, eventually leading to type-2 diabetes mellitus. So, it is meaningful to investigate the long-term changes in insulin secretion and resistance after delivery.

**Aim:** The aim of this study is to assess the insulin resistance and insulin secretory status of mothers with a history of GDM  $\geq$  5 years of index pregnancy.

**Method:** In this hospital based cross sectional study, 107 women with a history of GDM and 101 women without GDM were participated. Fasting insulin and C-peptide were measured by chemiluminescence method. Homeostatic Model Assessment (HOMA) was used to estimate  $\beta$ -cell secretory function (HOMA-B), insulin resistance (HOMA-IR), and insulin sensitivity (HOMA-%S). Data were analyzed by SPSS (version 25).

**Results:** Median time elapsed after index pregnancy was 9 years for GDM group and 7 years for NGT group ( $p=0.004$ ). C-peptide was significantly higher in GDM group compared to NGT group [3 (2.34-3.74) vs. 2.52(2.16-3.35);  $p=0.011$ ]. Fasting insulin and HOMA-IR had similar trends [15.3 (10.6-19.2) vs. 13.3 (10.0-17.25);  $p=0.044$  and 4.06 (2.71-6.25) vs. 3.11 (2.25-4.34);  $p<0.001$ , respectively]. On the other hand, HOMA-B was lower among GDM compared to the NGT [117.13 (74.39-185.28) vs. 159.45 (121.91-206.43);  $p<0.001$ ]. Fasting insulin level ( $p<0.001$ ), C-peptide ( $p<0.001$ ) and HOMA-IR ( $p<0.001$ ) increased progressively with the change of current glycemic status across NGT, prediabetes (PDM) and diabetes (DM) group. There was a gradual decline in  $\beta$ -cell function from NGT to DM group based on at present glycemic status ( $p<0.001$ ).

**Conclusion:** Women with GDM also had substantial  $\beta$ -cell dysfunction and insulin resistance after  $\geq$  5 years of index pregnancy. [*J Assoc Clin Endocrinol Diabetol Bangladesh, 2025;4(Suppl 1): S43*]

**Keywords:** Gestational diabetes mellitus, Insulin resistance,  $\beta$ -cell function

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