OBSERVATIONS

Antepartum Oral Disposition Index as a Predictor of Glucose Intolerance Postpartum

Although women with gestational diabetes mellitus (GDM) have an increased subsequent risk for diabetes, the diabetic risk might be heterogeneous because the degree of abnormal glucose metabolism varies. The glucose tolerance status in pregnancy is related with postpartum prediabetes or diabetes, whereas studies on the antepartum factors associated with dysglycemia postpartum are limited (1,2). Women with GDM should be screened for diabetes postpartum; however, some miss the follow-up for the glucose surveillance.

β-Cell function contributes to the development of glucose intolerance, and the oral glucose tolerance test (OGTT)-derived measures for β-cell function (i.e., oral disposition index [DIo]) seem to be predictive of developing diabetes (3). Likewise, the DIo during pregnancy might have potential to predict glucose intolerance postpartum. Therefore, we investigated the relation between antepartum DIo and postpartum glucose tolerance status in women with GDM.

With the approval of the institutional review board, the medical records were reviewed for 53 sequential women with GDM who were followed by postpartum OGTT between 2004 and 2010. Each woman underwent a two-step screening for GDM: universal early testing in women with high-risk characteristics and a standard 1-h 50-g oral glucose challenge test between 24 and 27 weeks' gestation for those not previously found to have glucose intolerance. Women with positive screen underwent a 75-g OGTT with the measurement of plasma glucose (mg/dL) and insulin concentration (mU/L) at basal, 30, 60, and 120 min after the glucose load. GDM was diagnosed by the criteria of the Japan Diabetes Society (4). Three to six months postpartum, the repeat OGTT characterized glucose tolerance status in women with recent GDM into the following categories by the Japan Diabetes Society criteria: diabetic, borderline, and normal (4). We calculated the antepartum DIo using the following measures: insulin secretion–sensitivity index-2 (ISSI-2) and insulinogenic index (IGI)/fasting insulin (5).

Compared with normal glucose tolerance (NGT; $n = 35$), women with glucose intolerance postpartum ($n = 18$: diabetes 3, borderline 15) demonstrated significantly lower levels of antepartum ISSI-2 (mean ± SD, 1.32 ± 0.38 vs. 1.69 ± 0.50; $P < 0.01$). There were significant differences in antepartum IGI/fasting insulin between the glucose intolerance postpartum and NGT groups (0.069 ± 0.045 vs. 0.109 ± 0.074, respectively; $P < 0.01$). After adjustment for pregravida BMI, family history of diabetes, glycemic profiles during pregnancy (i.e., plasma glucose levels during the OGTT and HbA_{1c}), antepartum ISSI-2 was still a negative correlate of glucose intolerance postpartum ($P < 0.05$). On receiver operating characteristic (ROC) analysis, the best predictor for glucose intolerance postpartum was ISSI-2 ≤1.44 (the area under the ROC curve [95% CI], 0.73 [0.59–0.87]: sensitivity of 61% and specificity of 80%).

This is the first report highlighting a potential role of the antepartum DIo to predict postpartum glucose intolerance. The adoption of the new criteria of GDM would result in the increased number of the affected women. Our findings suggest that antepartum DIo could help to identify those at highest risk of glucose intolerance postpartum and warrant further study of the appropriate follow-up strategy in GDM by the new criteria.

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