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## Effects of fasting and 2h OGTT blood glucose levels at diagnosis of gestational diabetes on birth weight and long term diabetes risk for the mother

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**Objective:** To investigate associations between glucose levels at the time of diagnosis of gestational diabetes (GDM) and infant birth weight and the long-term risk of manifest diabetes mellitus (DM) in the mother.

**Research design and methods:** In a nationwide Swedish study GDM pregnancies (n=2085) was compared with non-GDM pregnancies (n=3683). GDM was defined as capillary blood glucose (cB-glucose)  $\geq 9.0$  mmol/l (plasma glucose  $\geq 10.0$  mmol/l) after a 75g oral glucose tolerance test (OGTT). Follow up questionnaires 8.5-13.5 yrs. after initial diagnosis were answered by 1324 GDM women (65%). In order to validate questionnaire data 51 women from a local area of South East of Sweden agreed to participate in a clinical follow-up including 75g OGTT.

**Results:** GDM women were older, shorter, had higher BMI, and higher mean infant birth weight compared with controls (3683g vs. 3543g,  $P < 0.001$ ). In multiple linear regression analysis, birth weight was positively correlated to fasting cB-glucose at GDM diagnosis ( $P < 0.001$ ), increased week of gestation ( $P < 0.001$ ) and BMI before pregnancy ( $P < 0.046$ ), while increasing levels of 2h OGTT cB-glucose were not related. Infants born to mothers with fasting cB-glucose  $\leq 5.0$  mmol/l had no increased mean birth weight or macrosomia compared to controls. In the long term follow up 334/1324 women (25 %) of the GDM women had developed DM, 215 T2D, 46 T1D and 72 unclassified. In logistic regression fasting cB-glucose and 2h OGTT cB-glucose at diagnosis of GDM, high BMI before pregnancy, as well as origin outside Europe were risk factors for manifest DM. In the clinical follow up of 51 women 12/51 (24%) reported DM, and in addition 4 more patients were diagnosed with DM after OGTT, increasing the prevalence to 16/51 patients (31%). Moreover, 22/51 were diagnosed with impaired fasting plasma glucose (IGF) or impaired glucose tolerance (IGT), left only 13 (24%) with normal glucose tolerance.

**Conclusions:** Fasting blood glucose at diagnosis of GDM gives important information about pregnancy outcome and future risk for maternal diabetes and has to be measured in addition to OGTT 2-hour glucose values. Our data suggests that all women with GDM diagnosed by 2-hour plasma glucose  $\geq 10.0$  mmol/l after 75g OGTT must be recommended life-long follow-up regarding glucose disturbances.

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