

DIABETES

Glucose levels and adverse pregnancy outcomes

High first trimester fasting glucose levels, below levels diagnostic of gestational diabetes mellitus, are associated with an increased risk of gestational diabetes mellitus, cesarean section and delivery of large for gestational age neonates, new data reveal.

Several previous studies have shown a graded relationship between increasing levels of plasma glucose measured at pregnancy weeks 24–32 and adverse pregnancy outcomes including increased birth weight, primary cesarean section and pre-eclampsia. In this new study, Riskin-Mashiah and co-investigators wanted to find out whether fasting plasma glucose levels measured in the first trimester of pregnancy reveal a similar association with adverse pregnancy outcomes.

The single center, retrospective study included women who had delivered a single baby at the investigators' hospital in Israel between 2001 and 2006 and who had results of a first-trimester fasting glucose level test. Women were excluded if delivery occurred at <24 weeks of gestation, if they had pregestational diabetes mellitus or if their first trimester fasting glucose level was >5.8 mmol/l—the level considered abnormal by the National Diabetes Data Group. First trimester fasting glucose levels were divided into seven categories for the

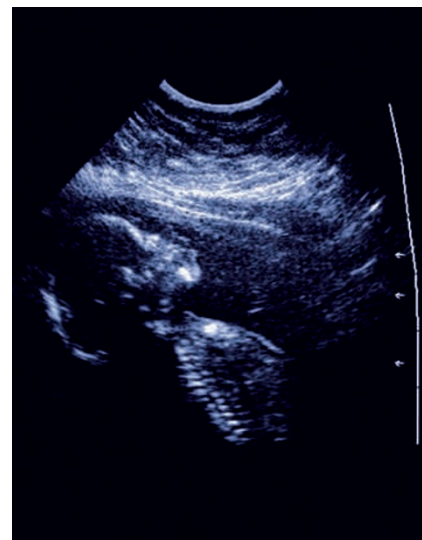
analysis: <4.2 mmol/l, 4.2–4.4 mmol/l, 4.5–4.7 mmol/l, 4.8–4.9 mmol/l, 5.0–5.2 mmol/l, 5.3–5.5 mmol/l and 5.6–5.8 mmol/l.

Of the 6,129 women included in the study, 173 developed gestational diabetes mellitus later in pregnancy and 634 delivered neonates that were large for gestational age and/or macrosomic. Furthermore, 843 of 5,679 women without a prior cesarean section had a primary cesarean delivery.

Frequencies of the primary outcomes—gestational diabetes mellitus, cesarean section, and delivery of a neonate large for gestational age and/or macrosomic—increased with increasing levels of fasting glucose. For example, frequency of gestational diabetes mellitus increased from 1.0% for the <4.2 mmol/l category to 11.7% for the 5.6–5.8 mmol/l category.

The graded association between first trimester fasting glucose level and gestational diabetes mellitus persisted after adjustment for pregestational BMI in a subgroup analysis of 4,876 women. Moreover, the graded association between fasting glucose levels and risk of large for gestational age and/or macrosomic neonates remained after exclusion of women who had developed gestational diabetes mellitus.

The findings highlight the potential benefits of using first trimester fasting



glucose screening to detect women at a high risk of developing gestational diabetes mellitus. The researchers point out that screening in the third trimester provides scant time to treat the condition. By contrast, diet and exercise interventions initiated in at-risk women during the second trimester might improve maternal and neonatal outcomes.

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Original article Riskin-Mashiah, S. *et al.* First trimester fasting hyperglycemia and adverse pregnancy outcomes. *Diabetes Care* 32, 1639–1643 (2009).