Hyperglycemia and adverse pregnancy outcome study: neonatal glycemia.

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Abstract

OBJECTIVE: The goal was to describe the temporal pattern of neonatal plasma glucose levels and associations with maternal glucose levels, cord serum C-peptide levels, and neonatal size and adiposity.

METHODS: A total of 17,094 mothers and infants were included in the Hyperglycemia and Adverse Pregnancy Outcome Study (15 centers in 9 countries). Mothers underwent a 75-g, 2-hour, oral glucose tolerance test (OGTT) at 24 to 32 weeks of gestation. Cord blood and neonatal blood samples were collected. Biochemical neonatal hypoglycemia was defined as glucose levels of <10th percentile (2.2 mmol/L). Clinically identified hypoglycemia was ascertained through medical record review and associations were assessed.

RESULTS: Plasma glucose concentrations were stable during the first 5 hours after birth. Maternal glucose levels were weakly positively associated with biochemical neonatal hypoglycemia (odds ratios: 1.07-1.14 for 1-SD higher OGTT glucose levels). Frequency of neonatal hypoglycemia was higher with higher cord C-peptide levels (odds ratio: 11.6 for highest versus lowest C-peptide category). Larger and/or fatter infants were more likely to have hypoglycemia (P < .001), and infants with hypoglycemia tended to have a higher frequency of cord C-peptide levels of >90th percentile.
CONCLUSIONS: Mean neonatal plasma glucose concentrations varied little in the first 5 hours after birth, which suggests normal postnatal adjustment. Biochemical and clinical hypoglycemia were weakly related to maternal OGTT glucose measurements but were strongly associated with elevated cord serum C-peptide levels. Larger and/or fatter infants were more likely to develop hypoglycemia and hyperinsulinemia. These relationships suggest physiologic relationships between maternal glycemia and fetal insulin production.

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