

Low 50-Gram 1-hour Glucose Challenge Test Value Predicts Birth Weight Less than 10th Percentile: A Meta- Analysis

Authors

Melanie Mitta, MD, Luis Sanchez-Ramos, MD, Jared T. Roeckner, MD, Stevie Bennett, MD, Andrew Kovacs, MD, Andrew M. Kaunitz, MD

Objective

The objective of this study was to perform a systematic review with meta-analysis to investigate if women with low 50-gram 1-hour glucose challenge test (GCT) values are at risk for having neonates with a birth weight less than 10th percentile.

Data Sources

PubMed, Medline, Google Scholar, Cochrane, and clinicaltrials.gov were searched from January 1966 to March 2019.

Methods of Study Selection

We included studies that reported maternal and neonatal outcomes of women with a low 50-gram 1 hour glucose challenge test value. Outcomes included birth weight less than 10th percentile, cesarean delivery, respiratory distress, neonatal intensive care unit (NICU) admission, preterm delivery, Apgar scores less than 7 at 5 minutes, or preeclampsia or pregnancy-induced hypertension. A random effects model was used to calculate pooled odds ratio (OR) with their 95% confidence intervals (CI) for each outcome. 95% prediction intervals were also calculated. Heterogeneity was assessed by implementation of the I² statistic, and visual interpretation of L'Abbe plots.

Tabulation, integration, and results

Sixteen cohort studies consisting of 8,008 patients with a low GCT value (study group) and 35,535 patients with normal GCT values (comparison group) were included for analysis. Women with maternal hypoglycemia, defined by a low GCT value, were noted to have a 43% increased odds of having neonates with birth weight less than 10th percentile (OR 1.43; 95% CI 1.28 - 1.60) and less than 2,500 grams (OR 1.3; 95% CI 1.0 - 1.7). Risk for preterm delivery was similar in the low GCT and comparison groups (OR 1.02; 96% CI 0.83 - 1.25). The predictive interval for a birth weight less than 10th percentile indicated that in 95% of future studies, the true effect will range from 1.14 to 1.79. In addition, patients in the study group had a lower risk for having a cesarean delivery. The rates of NICU admission, PIH/preeclampsia, respiratory distress, NICU, and Apgar scores less than 7 were not different between the groups.

Conclusion

Patients with a low GCT value are at significantly increased risk of having neonates with a birth weight less than 10th percentile and less than 2,500 grams. These women have a lower chance of cesarean delivery.