# Analyzing the Predictive Value of an Early 1-hour Glucose Tolerance Test in High-Risk Pregnancies

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## Background

**Introduction:** In pregnancies at elevated risk for developing gestational diabetes mellitus (GDM) patients undergo early glucose tolerance testing (eGTT) before 20 weeks gestation. If they pass the eGTT, they repeat the series at 24-28 weeks gestation (Figure 1).

**Goal:** This study aimed to assess the predictive value of a 1-hour eGTT as it relates to the repeat 1-hour GTT (rGTT) at 24-28 weeks gestation to determine if proceeding directly to the 3-hour rGTT would be beneficial.

## Methods

**Study Design:** Retrospective chart review

**Participants:** Sixty individuals with BMI >30 who received an eGTT and a rGTT were included (Demographics in Table 1). Covariates included age and ethnicity.

**Statistical Analysis:** Risk ratios, 95% (Score) confidence intervals, and significance (Fisher's Exact Test) were estimated. A logistic regression model was fit with rGTT (dependent variable) and eGTT (independent variable). Odds ratios and 95% confidence intervals were extrapolated from the model. Significance of each independent variable was identified via a likelihood ratio test.

**Figure 1.** Current guidelines for oral glucose tolerance testing in patients at high-risk for gestational diabetes mellitus
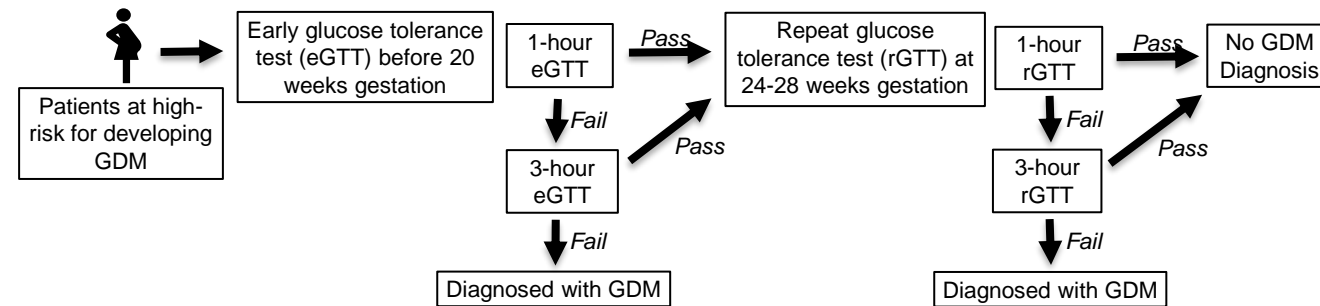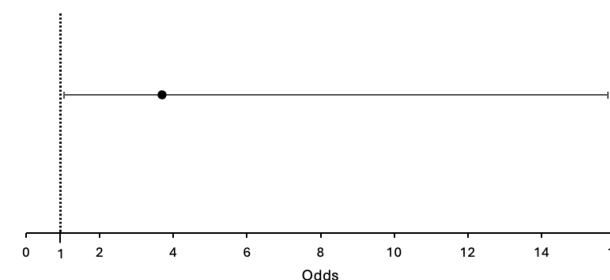


## Results

**Table 1.** Demographics

| Characteristic | Whole Sample (N=60) |
|---|---|
| Ethnicity | N (%) |
| Non-Hispanic | 35% |
| Hispanic | 65% |
| Parity | |
| Primip | 32% |
| Multip | 68% |
| | Mean (+/-SD) |
| Age | 28.3 +/- 6.13 |

**Figure 2.** Odds ratio after adjusting for age and ethnicity for individuals who failed the eGTT to fail the rGTT compared to those who passed the eGTT



**Summary:** Seventy-one percent of those who failed the 1-hour eGTT also failed the 1-hour rGTT. As seen in Figure 2, after adjusting for age and ethnicity, individuals who failed the 1-hour eGTT had 3.70x greater odds (95% CI:1.03x-15.80x) of failing the 1-hour rGTT compared to those who passed ($\chi$2=4.05;p=0.04).

## Conclusions

**Conclusion:** These data suggest that failing a 1-hour eGTT is significantly associated with failing a 1-hour rGTT which indicates a potential benefit in proceeding directly to a 3-hour rGTT at 24-28 weeks.

**Strengths:** This study focused on the most prevalent risk factor for developing GDM.

**Limitations:** Although patients with a BMI >30 exhibit a 2-8x higher risk of developing GDM, restricting the analysis to a single risk factor limits the external validity and generalizability of these findings.

## Implications

**Clinical Implications:** Bypassing the 1-hour rGTT and proceeding directly to the 3-hour rGTT at 24-28 weeks may offer potential benefits such as reducing healthcare costs. It may also reduce the time and resource burden on the patient that can be associated with multiple tests.

**Future Directions:** Further investigation with a larger sample size and broader range of patient risk factors is needed to fully understand the necessity of a 1-hour rGTT as it relates to failure of eGTT. Such research could inform the development of more individualized screening protocols and improve clinical decision-making regarding GDM testing.

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