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Body

## Plasma Glycated CD59 (pGCD59) Predicts Early Gestational Diabetes (GDM) and Abnormal Neonatal Outcomes: DALI Study Secondary Analysis

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pGCD59 is an emerging biomarker for diabetes and GDM. In 1,000 women undergoing 2-step GDM screening, pGCD59 at weeks 24-28 classified GDM subjects with high sensitivity and specificity and was associated with the risk of large for gestational age (LGA) babies. GDM early in pregnancy is a public health challenge because it increases the risk of adverse outcomes. To assess pGCD59 as a predictor of early GDM and abnormal outcomes, levels of pGCD59 were measured in 807 samples from women undergoing a 1-step OGTT (75gr-2hr; WHO 2013 criteria) at <20 weeks gestation in the DALI study, a European trial of women at high risk of GDM.

Results: Among 807 samples, 481 subjects had normal glucose tolerance throughout the pregnancy (Controls) and 205 met WHO 2013 criteria for GDM at <20 weeks (Cases). Age, race/ethnicity, and BMI were similar among Cases and Controls. pGCD59 accurately predicted the diagnosis of GDM in early pregnancy (AUCROC = 0.9). The risk of LGA (>90<sup>th</sup> percentile) was positively associated with pGCD59 ( $p = 0.04$ ) in Cases but not in Controls. Cases who delivered LGA newborns had higher median levels of pGCD59 than those who delivered non-LGA newborns (pGCD59 (SPU): Case-LGA: 4.4[1.5], Case-non-LGA 3.8[1.2];  $p = 0.03$ ). In contrast, median levels of pGCD59 were similar in Controls who delivered LGA or non-LGA newborns. The risk of congenital malformations or neonatal hypoglycemia was also associated with higher maternal levels of pGCD59: i) mothers who delivered babies with malformations had 60% higher mean pGCD59, ii) the odds ratio of a malformation was 3.4 (95% CI: 1.1, 10.1) in the 4<sup>th</sup> as compared with the 1<sup>st</sup> quartile of pGCD59, and iii) one unit increase in pGCD59 was associated with a 70% higher odds ratio of neonatal hypoglycemia. HbA1c failed to predict GDM or abnormal neonatal outcomes.

Conclusion: Our results indicate that pGCD59 is a simple and accurate biomarker for early detection of GDM and for risk assessment of its potentially serious complications.

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