Serum Glycome as a Diagnostic and Prognostic Factor in Gestational Diabetes Mellitus

Abstract

Gestational diabetes mellitus (GDM) is a risk factor for both mother and fetus/neonate during and after the pregnancy. Inconsistent protocols and cumbersome screening procedures warrant the search for new and easily accessible biomarkers. We investigated a potential of serum N-glycome to differentiate between healthy pregnant women (n = 49) and women with GDM (n = 53) using a lectin-based microarray and studied the correlation between the obtained data and parameters of glucose and lipid metabolism. Four out of 15 lectins used were able to detect the differences between the control and GDM groups in fucosylation, terminal galactose/N-acetylglucosamine (Gal/GlcNAc), presence of Galα1,4Galβ1,4Glc (Gb3 antigen), and terminal α2,3-sialylation with AUC values above 60%. An increase in the Gb3 antigen and α2,3-sialylation correlated positively with GDM, whereas the amount of fucosylated glycans correlated negatively with the content of terminal Gal/GlcNAc. The content of GlcNAc oligomers correlated with the highest number of blood analytes, indices, and demographic characteristics, but failed to discriminate between the groups. The presence of terminal Gal residues correlated positively with the glucose levels and negatively with the LDL levels in the non-GDM group only. The results suggest fucosylation, terminal galactosylation, and the presence of Gb3 antigen as prediction markers of GDM.