Abstract Title

Low glycaemic index diet for reduction of oxidative stress in women with gestational diabetes

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Abstract

Introduction: A low glycaemic index (LGI) diet may be beneficial to women with gestational diabetes (GDM) but it is not known whether this diet provides additional benefits on oxidative stress and antioxidant status.

Objective(s): To compare the effects of a LGI diet with that of standard care (SC) and the effects of GDM to normoglycemic pregnancies by examining markers of oxidative stress and antioxidant capacity.

Methods: Participants (n=43) with GDM from the glycemic index (GI) in GDM study (NCT01589757), provided plasma samples at baseline (V1), 4-6 weeks following dietary education intervention (V3), and 4-6 months post-partum (V4). Participants with GDM (n=8) and normoglycemic participants (n=10) provided breast milk (BM) samples. Plasma samples were analyzed for antioxidants by oxygen radical absorption capacity (ORAC), and for oxidative stress by the conjugated dienes to low density lipoprotein ratio (CD/LDL) and oxidized LDL (LDLox). BM was analyzed for antioxidants by ORAC.

Results: The main study participants (mean±SEM; age 34.2±0.7 years, pre-pregnancy BMI 26.4±0.9 kg.m2) were recruited at a mean gestational age of 25 weeks + 3.5 days. Between V1 and V3 the net change in mean plasma ORAC (±SEM) significantly increased in both diet groups (734±368 mM TE; p=0.006). Plasma LDLox increased significantly between V1 and V3 on the SC diet, but decreased slightly in LGI diet. As such, net change in LDLox was significantly different by diet group (LGI= -1.98±1.59; SC= 5.31±1.35; p=0.001). No significant differences were found in plasma CD/LDL or BM ORAC concentrations.

Conclusions: An LGI intervention may reduce plasma oxidative stress in women with GDM. Both SC and LGI diets may increase plasma antioxidants. GDM does not, however, appear to have any effect on BM antioxidants.

Significance to field of dietetics: This study provides further insight into the beneficial mechanisms of registered dietitians administering a LGI diet for GDM patients.