

Contributions of Dietary Fat to Carbohydrate Ratio and Vitamin D Intake and Status on Metabolic Health in Adults with *in utero* Exposure to Type 1 Diabetes

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Introduction

Diabetes during gestation increases future risk for metabolic and cardiovascular dysfunction in the offspring. Carbohydrate restriction in adults and increased vitamin D intake in children have been shown to improve metabolic outcomes. We investigated the effects of the dietary fat:CHO ratio and vitamin D intake and status on metabolic health in a unique, at-risk adult cohort: offspring of women with type 1 diabetes.

Hypotheses

1) A higher dietary fat:CHO ratio will be associated with both lower Metabolic Syndrome Severity Z-Score and insulin resistance as measured by HOMA-IR, and 2) Higher vitamin D intake and status will be associated with a lower prevalence of diabetes and prediabetes.

Methods

Study participants were drawn from 439 offspring of women with Type 1 diabetes. Dietary intake was assessed via three unannounced 24-hour dietary recall interviews and the Block 2014 food frequency questionnaire. Glucose, insulin, triglyceride, HDL-cholesterol, 25-OH vitamin D, and HbA1c levels were measured. Multiple logistic regression was used to estimate associations between dietary intake and metabolic outcomes.

Results

To date, data from 70 of the 91 participants currently enrolled are available. The 24-hour dietary recall median fat:CHO ratio was 0.37 (25th, 75th percentile: 0.30, 0.43). The median vitamin D intake was 4.8 mcg (2.6, 11.0). Based on American Diabetes Association criteria for OGTT, FPG, and HbA1c levels, 44 participants were classified as healthy, 15 in the pre-diabetic range, and 11 in the diabetic range. The curvilinear association of dietary vitamin D intake with prediabetes ($X^2=0.72$, $df=2$, $p=0.697$) and diabetes ($X^2=3.27$, $df=2$, $p=0.195$) was not significant.

Conclusions

Vitamin D intake did not have a significant impact on prediabetes or diabetes status. However, vitamin D status is only partially influenced by diet, and blood 25-OH vitamin D results are pending. Laboratory results for insulin resistance and the Metabolic Syndrome Severity Z-Score are also pending. Should links between these dietary parameters and metabolism be observed in this population, it could suggest the need for improved education or targeted interventions to reduce the risk for developing diabetes and related complications.

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