

## Abstract

The objective of this study was to determine the relationship between Gestational Diabetes (GD), and dietary energy density (ED) in a nationally representative sample of pregnant women residing in the US who participated in the 2009-2012 National Health and Nutrition Examination Surveys (NHANES). Dietary ED (kcal/gram) was calculated using multiple methods. Diet quality was assessed using HEI component scores, with FNDDS food codes.

Data regarding gestational diabetes (GD) status was provided by the NHANES. Women were categorized as having a positive diagnosis for GD, having a diagnosis of "borderline GD", or having a no gestational diabetes. All data was analyzed using appropriate survey weights and procedures in SAS 9.3. Our results indicate dietary ED, calculated using food only, is positively associated with gestational diabetes.

Women without gestational diabetes have a significantly lower dietary ED than those with gestational diabetes or those with borderline gestational diabetes (1.78 vs. 1.85 vs. 2.00, respectively; p-trend 0.01) after controlling for age, marital status, race, and socioeconomic status.

Interventions that lower dietary ED by increasing fruit and vegetable intake, and decreasing carbohydrates and other high-density food intake should be explored as strategies to target gestational diabetes.

## Introduction

- Gestational diabetes affects up to 16% of pregnant women, with that number increasing as trends of obesity and unhealthy lifestyles increase
- The risk for diabetes has a strong correlation with obesity, and can be responsible for 80-95% of the increase in diabetes
- The risks are not just short-term, but they are long-term as well and this applies to both the mothers and their children
- Long-term studies showed improvements in glycaemic control, as well as carbohydrate metabolism and insulin sensitivity as a direct result of physical activity and exercise
- Energy density (ED) is a ratio of the amount of energy per weight of food (kcal/g)
- The National Health and Nutrition Examination Survey (NHANES) is a large, cross-sectional survey conducted by the National Center for Health Statistics that is designed to assess the health and nutritional status of non-institutionalized civilians in the US

## Aim

- Evaluate the relationship between dietary energy density and Gestational Diabetes

## Methods

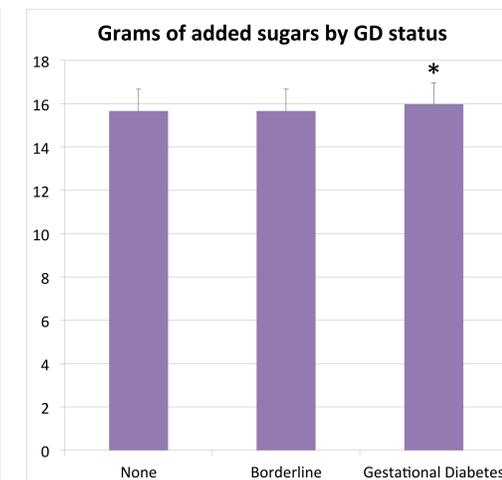
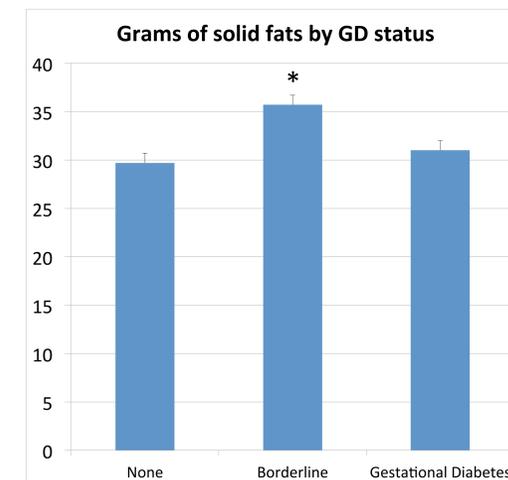
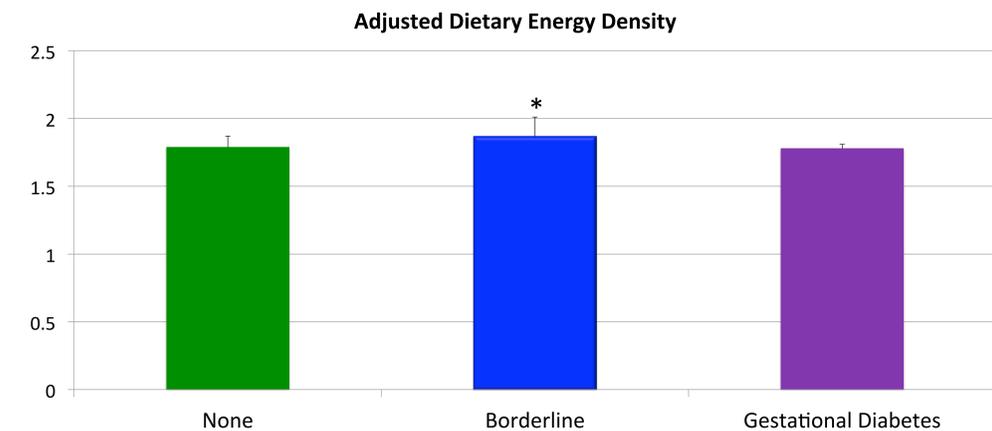
- Study sample of 4,028 women >18 years who participated in the 2009-2012 NHANES who had previously been pregnant, including those who are currently pregnant
- Dietary intake was measured using 24-hour recalls.
- Specific survey procedures were used in the analysis to account for sample weights, unequal selection probability, and clustered design
- Dietary ED was calculated by dividing the energy content (in kcal) by weight of food (in g) consumed. Age- and sex-specific quartiles of ED were created to examine the relationship between dietary ED and makers for abdominal obesity
- The ED of each reported food was calculated and foods were categorized into ED groups. The proportion of total energy intake from each group was also quantified

## Subject Characteristics

	Sample n	Weighted n	%
<b>Age</b>			
18-30	506	9298937	11.1
31-50	1415	31823494	38.0
51-70	1416	30563854	36.5
Over 70	691	12069652	14.4
<b>Race</b>			
NH-White	1765	57092553	68.2
NH-Black	929	10573688	12.6
Mex-Am	593	6652741	7.9
Other	741	9436955	11.3
<b>Income Level</b>			
PIR <130%	1675	24673293	29.5
130<= PIR <= 350%	1353	28578258	34.1
PIR > 350%	1000	30504386	36.4
<b>Smoking Status</b>			
Never Smoker	2451	48205138	57.6
Current Smoker	740	16011970	19.1
Ever Smoker (>100 cigarettes)	837	19538828	23.3
<b>Education</b>			
HS or less	1107	15877386	19.0
High School Grad/GED	898	18562768	22.2
Some College or AA degree	1244	27191910	32.5
College Graduate or above	772	22049977	26.3
<b>Body Weight Status (BMI classification; of non-pregnant women only)</b>			
Underweight (<18.5)	27	699090	1.8
Normal Weight (18-5024.9)	494	12512382	33.1
Overweight (25.0-29.9)	468	10038674	26.5
Obese (>30.0)	686	12755827	33.7
<b>Self-Reported Diet Quality ("How Healthy is Your Diet?")</b>			
Excellent	335	7916494	9.5
Very Good	811	20384545	24.3
Good	1697	34236989	40.9
Fair	956	17082303	20.4
Poor	227	4103265	4.9
<b>Babies LGA (&lt;9lbs)</b>			
No	3054	62870519	81.4
Yes	691	14347257	18.6
<b>Currently Pregnant</b>			
No	1675	36005973	95.1
Yes	81	1849446	4.9
<b>History of Gestational Diabetes?</b>			
Yes	277	5799490	6.9
Borderline	53	769931	0.9
No	3692	77125251	92.2



## Results



- No differences found with intakes of grams of carbohydrates or grams of protein.
- Results also showed that for consumption of cookies/cake as well as consumption of 100% fruit juice, those diagnosed with borderline gestational diabetes had a significantly higher consumption amount than those with or without gestational diabetes, with p-values of .0086 and 0.0342, respectively.

## Conclusions

- Women without gestational diabetes have a significantly lower dietary ED than those with borderline gestational diabetes (1.78 vs. 1.85, p=0.01).
- Interventions that lower dietary ED by increasing fruit and vegetable intake, and decreasing carbohydrates and other high-density food intake should be explored as strategies to target gestational diabetes.