

Markers of Maternal Socioeconomic Status and Their Impact on Maternal Dietary Intake of B-Vitamins

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Background: The B-vitamins (which include B1, B2, B3, B6, B9, and B12) are critical metabolic co-factors in neurocognitive, immunological, hematological, endocrine, and gene regulation pathways. Insufficiencies of these micronutrients can have profound, deleterious effects on both fetal and maternal health outcomes. These include increased rates of neural tube defects, intrauterine growth restriction, and anemia for the fetus and increased risks of insulin resistance, depression, and cardiovascular dysfunction for the mother. While previous studies have demonstrated the negative influence of low maternal socioeconomic status (SES) on maternal dietary intake, none to our knowledge have focused specifically on the effects of low maternal SES on B-vitamins.

Objective: This study aimed to assess the relationship between maternal socioeconomic status (SES) using the markers of Food Security Score (FSS) and insurance type with reported maternal intake of B-vitamins.

Experimental Design: An IRB-approved study enrolled 448 women who presented to Nebraska Medicine for delivery. The Harvard Food Frequency Questionnaire was utilized to quantify average daily B-vitamin intake during pregnancy. The USDA Household FSS Survey Module was collected to categorize participants into high (n=337), marginal (n=49), or low (n=62) food security groups. Insurance payor group (public vs. private) was obtained from the electronic medical record. Mann-Whitney U and Kruskal-Wallis tests were performed to assess differences in reported maternal dietary intake of B1, B2, B3, B6, B9, and B12 across FSS and insurance payer groups. Median B-vitamin intake between FSS groups was assessed post-hoc. A p-value < 0.05 was considered statistically significant.

Results: In our cohort, there was a statistically significant difference in maternal B-vitamin dietary intake across the FSS groups for B1 (p=0.01), B2 (p=0.01), B3 (p=0.01), B6 (p=0.01), B9 (p=0.02), and B12 (p=0.02). Median B-vitamin intake was consistently lowest in the marginal FSS group compared to both high and low FSS groups. Median B9 (folate) intake was lower in the public insurance payor group as compared to the private insurance payor group (808.53 mcg vs 1007.33 mcg, p=0.02).

Conclusion: We found that pregnant women with marginal FSS had the lowest intake of B vitamins during pregnancy, which may suggest that women in this group do not have access to the same resources as women in high and low FSS groups. Future studies should expand the enrollment of women from marginal, low, and very-low FSS groups as well as measure the concentrations of these micronutrients in maternal and fetal plasma samples.