Prevalence and Disparities of Vitamin D Supplementation Among Women of Childbearing Age

Deborah Beth Gardner

Background: Recent years have marked a rise in awareness of vitamin D deficiency and its etiologic roles in health and disease. Vitamin D supports autoimmune system development and function, nutritional health, cardiovascular function, bone strength, and other markers of wellness. Deficiency is associated with outcomes such as cardiovascular disease, some cancers, metabolic illness, autism, multiple sclerosis, diabetes, mental health problems, and all-cause mortality. Most children show inadequate levels of vitamin D, as do most pregnant women and women of childbearing age. Maternal vitamin D deficiency is associated with subsequent infant autoimmune disorders and gestational diabetes, among other problems. Women are more likely to be vitamin D deficient than men. Previous assessments of US vitamin D supplementation cite data prior to 2007; since vitamin D gained significant recognition in 2007-2008 and later, a more updated look at who is taking supplements is critical. Past studies also either focused away from women of childbearing age or did not look at associations between vitamin D supplement use and demographic factors such as obesity and socioeconomic status, despite relevant nutritional and obesity disparities in the US.

Methods: We examined the prevalence of vitamin D supplementation (any, amount) among women of childbearing age (16-49 years) in the National Health and Nutrition Examination Survey (NHANES) 2007-2008 dataset, the most recently available NHANES dietary data files. We analyzed demographic (age, race/ethnicity), socioeconomic (education, income, food security, health insurance, years in the US), and health (BMI, waist circumference, physical activity, diabetes, weight loss attempts) subgroups. We also examined the prevalence of

supplementation by broad US geographic region/season (north/summer and south/winter), reasons for intake of vitamin D, and measures of parity and breastfeeding. Linear and logistic regression models were used to examine associations of Vitamin D supplementation (any, amount) and the above variables to assess disparities. All analyses were conducted using Stata versions 11 and 12 (College Station, TX). Sampling weights were applied to adjust standard errors for the complex survey design, with estimates generalizable to children and youth in the US non-institutionalized population.

Results: Out of 1,749 women in the study, 459 (32.9%) had taken supplements containing vitamin D during the past 30 days. Disparities in vitamin D supplement use were observed by race/ethnicity, health insurance status, food insecurity, household income, education, and diabetes status. Lower vitamin D intake was also observed in groups with the highest strata of waist circumference and BMI.

Conclusions: Disparities in vitamin D supplementation parallel some other known disparities in nutrition and food access. Current levels of supplementation may reflect both increasing information of the importance of vitamin D and disparities in access to that information. Public health practitioners, providers, and advocates may benefit from this knowledge. Future studies should repeat this examination with the 2009-2010 NHANES data when they become available. Other future studies should examine supplement use among pregnant and breastfeeding women and compare intake of vitamin D with serum status when those data become available.

Thesis Committee:

Janice Bell, PhD MPH MN (Chair)

Mario Kratz, PhD MSc

Daniel Enquobahrie, MD PhD MPH