

Steck Advances Assessment Tool used to Study Vitamin D

Arnold School researcher Dr. Susan Steck received a seed grant from the Center for Research in Nutrition and Health Disparities that has yielded important findings related to vitamin D.

The one-year, \$16,000 award allowed her and other researchers to develop a cost-effective method to assess skin pigmentation and study its relationship to vitamin D status.

A faculty member in the Department of Epidemiology and Biostatistics, Steck is with the Arnold School's Cancer Prevention and Control Program. She and her colleagues are committed to finding solutions to ease the burden of cancer among South Carolinians, particularly cancer health disparities.

Key Points

- Research has shown that individuals with darker skin pigmentation do not produce the same levels of vitamin D as lighter skinned individuals.
- Vitamin D deficiency has been associated with bone loss, diabetes, cardiovascular disease, and types of cancer.
- USC researchers developed a valid and cost efficient method to measure skin pigmentation, which is needed to study the relationship of skin color and vitamin D status.
- Data from this study has led to further study of vitamin D status and different types of cancers.

Previous studies have shown that vitamin D deficiency exists among approximately 40 – 50 percent of African American adults, and 5 – 10 percent of white adults in the United States. Vitamin D deficiency also has been associated with bone loss, diabetes, cardiovascular disease, and types of cancer.

“We are interested in skin color because we know that when an individual is exposed to sunlight, the UVB [Ultraviolet B] rays activate production of vitamin D in the body,” she explained. “It has been shown that individuals who have darker skin pigmentation do not produce as much vitamin D for a given exposure of UVB rays as lighter skinned individuals.”

One of the study aims was to develop a valid measure of skin pigmentation that is more cost efficient than the spectrophotometer, considered the gold standard measurement tool for pigmentation. However, this measurement tool is expensive and not conducive to large population studies. Previous epidemiologic studies have focused on a variety of determinants of vitamin D status, but the majority of studies have not focused on assessing skin color because there had not been a convenient validated method for measuring it.

Dr. Cheryl Armstead, co-principal investigator of the study, previously used skin color cards, similar to those found in cosmetic areas of department stores, to examine skin pigmentation of African Americans, racism, and stress. The current study expanded her use of the color cards to include skin pigmentation of African Americans and European Americans.

In 2009, 40 healthy females (20 African Americans and 20 European Americans) were recruited to participate in the study. They were instructed to compare their skin color to the colors on the card and select the color on the card most similar to their own. To determine the validity of the color cards, their responses from the color cards were then compared to the readings from a spectrophotometer.

In addition, study participants provided a blood sample, which was used to measure vitamin D status, and provided information including physical activity levels, sun exposure, dietary intake, and use of supplements, to determine how much each item predicted vitamin D status. Measurements of skin color from the color cards were also examined to understand its association with vitamin D status. Data collection is complete, analysis of results are in progress. However, preliminary data indicated that 61

percent of African Americans and 22 percent of European Americans in the study sample were vitamin D deficient (defined as serum 25(OH)D < 20 ng/ml).

The central purpose of the Seed Grant Program of the Center for Research in Nutrition and Health Disparities is to “fund preliminary studies needed to develop an NIH proposal in interdisciplinary research related to nutrition and health disparities.”

Already, the seed grant has supported a successful grant proposal to examine vitamin D status in relation to prostate cancer aggressiveness among African American and European American men diagnosed with prostate cancer in the Southeast. This grant proposal was recommended for funding by the Department of Defense, and the project will begin soon.

Similarly, future grant proposals are planned, which will utilize preliminary data from the seed grant to further study vitamin D status and different types of cancers, including breast and colon cancers.