

UC Irvine

UC Irvine Previously Published Works

Title

SEASONAL VARIATION IN VITAMIN D LEVELS AMONG DIALYSIS PATIENTS

Permalink

<https://escholarship.org/uc/item/1dz6c1bf>

Journal

AMERICAN JOURNAL OF KIDNEY DISEASES, 71(4)

ISSN

0272-6386

Authors

Kleine, Carola-Ellen
Obi, Yoshitsugu
Rhee, Connie
[et al.](#)

Publication Date

2018

Copyright Information

This work is made available under the terms of a Creative Commons Attribution License, available at <https://creativecommons.org/licenses/by/4.0/>

Peer reviewed

167

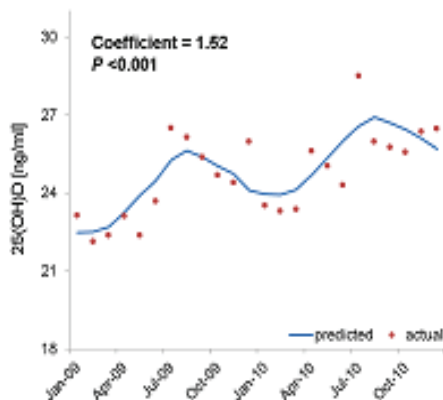
SEASONAL VARIATION IN VITAMIN D LEVELS AMONG DIALYSIS PATIENTS:

Carola-Ellen Kleine¹, Yoshitsugu Obi¹, Connie Rhee¹, Elani Streja¹, Kam Kalantar-Zadeh¹. ¹University of California Irvine, Orange, CA, USA

Vitamin D deficiency is common among patients with chronic kidney disease, and the need for vitamin D supplementation has been gaining recognition. However, it remains unclear to what extent seasonality affects vitamin D status, and the degree to which any seasonal effects may be modified by other patient characteristics. Further, year-over-year changes in vitamin D status among patients with end-stage renal disease have not been characterized.

In a national cohort of dialysis patients from a large dialysis organization, we identified 57,500 serum 25-hydroxy vitamin D (25(OH)D) measurements from 25,025 patients during 2009-2010. We used a cosinor model to evaluate the seasonal variation in 25(OH)D, accounting for the measurement date, age, gender, race/ethnicity, diabetes, BMI, and serum albumin along with the regional mean ultraviolet (UV) index and its annual variation. We also included interaction terms between covariates and the cosine variable.

Figure 1. Fitted cosinor model for predicted 25 (OH) concentrations.



Estimated population mean serum 25(OH)D levels varied seasonally with a peak in August and a nadir in February of each year. The difference between the highest and lowest estimated values was 3.0 ng/mL. We observed an increase in 25(OH)D levels of 1.4 ng/mL per year ($p < 0.001$). Factors associated with lower 25(OH)D levels were female sex, African-American race, diabetes, higher mean UV Index, and higher BMI ($p < 0.001$ for all). Older age and higher serum albumin levels were paradoxically associated with greater 25(OH)D levels. In addition, older age, female sex, African-American race, higher BMI, and lower serum albumin levels were associated with lower amplitude of seasonal 25(OH)D variation (p -interaction < 0.001 except for female [$p = 0.05$]).

In conclusion, we detected seasonal variation of 25(OH)D in dialysis patients. Clinicians and researchers should account for the seasonality and the secular trend in serum 25(OH)D levels when evaluating vitamin D status in this population.