Association of Vitamin D Deficiency with Functional Disability and Chronic Diseases Among Veterans Entering a Nursing Home

Anna Tamai MD; Gotaro Kojima MD; Kamal Masaki MD; James Epure MD; Craig China MD; G. Webster Ross MD; Helen Petrovitch MD; and Marianne Tanabe MD

Abstract

Background: Nursing home residents are at high risk of vitamin D deficiency. There has been only one previous study about vitamin D status on admission to the nursing home, and limited data are available about associations with functional disability and chronic diseases.

Methods: Data were collected by retrospective chart review of electronic medical records and Minimum Data Set (MDS) for all veterans admitted to a VA nursing home in Honolulu, Hawai'i, between January 2011 and June 2012. All veterans had a comprehensive geriatric assessment and measurement of serum 25-hydroxyvitamin D level within 7 days of admission. Females, hospice patients, vitamin D supplement users, and those transferred from other nursing homes were excluded, leaving a final analytic sample of 104 patients. Vitamin D deficiency was defined as serum 25-hydroxyvitamin D level <20 ng/mL. Baseline data collected included age, ethnicity, BMI, functional disability (mobility, bathing, dressing, toileting, continence, and feeding) and prevalent chronic diseases to study cross-sectional associations of vitamin D deficiency using logistic regression.

Results: Prevalence of vitamin D deficiency on admission to the nursing home was 49.0% (51/104) among male veterans not taking supplements. The mean age was 70.6 years (range 35-95), with ethnicity as follows: 51 (49.0%) White, 34 (32.7%) Asian, and 6 (5.8%) Black. In multiple logistic regression models adjusted for age, ethnicity and BMI, vitamin D deficiency was significantly associated with number of ADL disabilities (OR = 1.36 for each increase in ADL disability, 95%CI = 1.03-1.78, $P = .03$)

and prevalent diabetes (OR = 2.99, 95%CI = 1.12-7.99, $P = .03$). When all six ADL disabilities were entered separately into the multivariate logistic regression model instead of total number of ADL disabilities, only the disability in feeding (OR = 4.74, 95%CI = 0.97-23.23, $P = .05$) and prevalent diabetes (OR = 2.92, 95%CI = 1.03-8.24, $P = .04$) remained significant. There were no significant associations between vitamin D deficiency and prevalent hypertension, hypercholesterolemia, coronary artery disease, stroke, cancer, depression or dementia.

Conclusions: Almost half the male patients entering a nursing home in Hawai'i had vitamin D deficiency. A high number of ADL disabilities, disability in feeding, and prevalent diabetes were independently associated with vitamin D deficiency. Future studies should focus on targeting these patients for screening and intervention with supplementation to possibly prevent adverse health outcomes of vitamin D deficiency.

Conflict of Interest

The authors report no conflict of interest.

Authors' Affiliations:

- Veterans Affairs Pacific Islands Health Care System, Honolulu, HI (J.E., C.C. G.W.R., H.P. M.T.)
- The John A. Hartford Foundation Center of Excellence in Geriatrics, Department of Geriatric Medicine, John A. Burns School of Medicine, University of Hawai'i, Honolulu, HI (A.T., G.K., K.M. J.E., C.C., M.T.)
- Pacific Health Research and Education Institute, Honolulu, HI (W.R., H.P.)

Correspondence to:

Anna Tamai MD; Email: anna_amandopondo@yahoo.co.jp