

# Your membership matters.

Continue to help lead the fight against kidney disease. Renew today.

[www.asn-online.org/membership](http://www.asn-online.org/membership)



# CJASN

Clinical Journal of the  
American Society of Nephrology

[HOME](#) | [CURRENT ISSUE](#) | [ADVERTISE](#) | [SUBSCRIBE](#) | [ARCHIVES](#) | [FEEDBACK](#) | [ALERTS](#) | [HELP](#)

User Name

Password

[LOG-IN](#)

Search

[Go](#)

Advanced Search

## Cholecalciferol, Calcitriol, and Vascular Function in CKD: A Randomized, Double-Blind Trial

Jessica Kendrick<sup>\*,†</sup>, Emily Andrews<sup>\*</sup>, Zhiying You<sup>\*</sup>, Kerrie Moreau<sup>‡</sup>,  
Kristen L. Nowak<sup>\*</sup>, Heather Farmer-Bailey<sup>\*</sup>, Douglas R. Seals<sup>§</sup>,  
Michel Chonchol<sup>\*</sup>

[+](#) Author Affiliations

### Correspondence:

Dr. Jessica Kendrick, Division of Renal Diseases and Hypertension, University of Colorado Denver, Denver Health Medical Center, 660 Bannock Street, Mail Code 4000, Denver, CO 80204. Email: [Jessica.Kendrick@ucdenver.edu](mailto:Jessica.Kendrick@ucdenver.edu)

### Abstract

**Background and objectives** High circulating vitamin D levels are associated with lower cardiovascular mortality in CKD, possibly by modifying endothelial function. We examined the effect of calcitriol versus cholecalciferol supplementation on vascular endothelial function in patients with CKD.

**Design, setting, participants, & measurements** We performed a prospective, double-blind, randomized trial of 128 adult patients with eGFR=15–44 ml/min per 1.73 m<sup>2</sup> and serum 25-hydroxyvitamin D level <30 ng/ml at the University of Colorado. Participants were randomly assigned to oral cholecalciferol (2000 IU daily) or calcitriol (0.5 µg) daily for 6 months. The primary end point was change in brachial artery flow-mediated dilation. Secondary end points included changes in circulating markers of mineral metabolism and circulating and cellular markers of inflammation.

**Results** One hundred and fifteen patients completed the study. The mean (SD) age and eGFR of participants were 58±12 years old and 33.0±10.2 ml/min per 1.73 m<sup>2</sup>, respectively. There were no significant differences between groups at baseline. After 6 months, neither calcitriol nor cholecalciferol treatment resulted in a significant improvement in flow-mediated dilation (mean±SD percentage flow-mediated dilation; calcitriol: baseline 4.8±3.1%, end of study 5.1±3.6%; cholecalciferol: baseline 5.2±5.2%, end of study 4.7±3.6%); 25-hydroxyvitamin D levels increased significantly in the cholecalciferol group compared with the calcitriol group (cholecalciferol: 11.0±9.5 ng/ml; calcitriol: −0.8±4.8 ng/ml; *P*<0.001). Parathyroid hormone levels decreased significantly in the calcitriol group compared with the cholecalciferol group (median [interquartile range]; calcitriol: −22.1 [−48.7–3.5] pg/ml; cholecalciferol: −0.3 [−22.6–16.9] pg/ml; *P*=0.004).

**Conclusions** Six months of therapy with calcitriol or cholecalciferol did not improve vascular endothelial function or improve inflammation in patients with CKD.

chronic kidney disease Vitamin D vascular disease clinical trial  
Adult Brachial Artery Calcifediol Calcitriol Cholecalciferol  
Dilatation Double-Blind Method glomerular filtration rate Humans  
Inflammation Minerals parathyroid hormone Prospective Studies  
Renal Insufficiency, Chronic Vitamins 25-hydroxyvitamin D

Received February 23, 2017.

Accepted June 7, 2017.

Copyright © 2017 by the American Society of Nephrology

[« Previous](#) | [Next Article »](#)  
[Table of Contents](#)

### This Article

Published online before  
print August 2017, doi:  
10.2215/CJN.01870217  
CJASN September 07,  
2017 vol. 12 no. 9 1438–  
1446

[» Abstract Free](#)

Figures Only

[Full Text](#)

[Full Text \(PDF\)](#)

Supplemental Data

[Article Usage Stats](#)

Article Usage Statistics

### Services

Email this article to a  
colleague

Alert me when this article is  
cited

Alert me if a correction is  
posted

Similar articles in this journal

Similar articles in PubMed

Download to citation manager

[© Get Permissions](#)

[Citing Articles](#)

[Google Scholar](#)

[PubMed](#)

[Related Content](#)

### Current Issue

March 07, 2018, 13 (3)



Alert me to new issues of  
CJASN

[ONLINE SUBMISSION](#)

[AUTHOR RESOURCES](#)

[ABOUT CJASN](#)

[EDITORIAL BOARD](#)

[REPRINTS/PERMISSIONS](#)

[IMPACT FACTOR](#)

[MOST READ](#)

[MOST CITED](#)

**CJASN ePress**

Updated on:  
March 9, 2018  
By Date / By Subject



Advertising Disclaimer

## Related articles

#### Editorials:

Nigel D. Toussaint and Irene Ruderman

#### What Is the Role of Vitamin D Supplementation on Vascular Health in CKD?

CJASN September 07, 2017 12: (9) 1377–1379; published ahead of print August 7, 2017, doi:10.2215/CJN.07170717

»Full Text »Full Text (PDF)

#### We recommend

##### Effects of Vitamin D2 Supplementation on Vitamin D3 Metabolism in Health and CKD

Zona Batacchi et al., Clin J Am Soc Nephrol

25-hydroxyvitamin D levels inversely associate with risk for developing coronary artery calcification.

Ian H de Boer et al., J Am Soc Nephrol

##### A Randomized Trial of Vitamin D Supplementation on Vascular Function in CKD

Vivek Kumar et al., J Am Soc Nephrol

Decreased conversion of 25-hydroxyvitamin D3 to 24,25-dihydroxyvitamin D3 following cholecalciferol therapy in patients with CKD.

Jason R Stubbs et al., Clin J Am Soc Nephrol

#### The Authors Reply

Vivek Kumar et al., J Am Soc Nephrol

Evaluation of responses to vitamin D3 (cholecalciferol) in patients on dialysis: a systematic review and meta-analysis

Chen Xu et al., J Investig Med

##### Vitamin D Supplements Improve Markers of Bone Turnover in CKD

PracticeUpdate

High serum soluble  $\alpha$ -Klotho levels in patients with autosomal dominant polycystic kidney disease

Funda Sari et al., J Investig Med

##### An Association Between Metabolic Syndrome and Chronic Kidney Disease

PracticeUpdate

Comparison of Ticagrelor Versus Prasugrel for Inflammation, Vascular Function, and Circulating Endothelial Progenitor Cells in Diabetic Patients With Non-ST-Segment Elevation Acute Coronary Syndrome Requiring Coronary Stenting: A Prospective, Randomized, Crossover Trial

Han Saem Jeong et al., JACC: Cardiovascular Interventions

Powered by **Trend MD**

#### Articles citing this article

##### Studying the Effect of Vitamin D Supplementation on Vascular Function in CKD: A Work in Progress

J. Am. Soc. Nephrol. March 9, 2018 0: (2018)  
ASN.2017111222v1-ASN.2017111222

##### The Authors Reply

J. Am. Soc. Nephrol. March 9, 2018 0: (2018)  
ASN.2017121242v1-ASN.2017121242

##### Comparative Effects of Cholecalciferol and Calcitriol on Circulating Markers of CKD Mineral Bone Disorder: A Randomized Clinical Trial

CJASN March 7, 2018 0: (2018) CJN.00480118v1-CJN.00480118

Be a part of something innovative, influential and dynamic.  
**Be a part of ASN.**



ASN members enjoy discounts on ASN's educational programs, subscriptions to ASN's publications, and more.

Join or renew today at  
[www.asn-online.org/membership](http://www.asn-online.org/membership)

