

# Abstract

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## The effects of high-dose vitamin E supplementation on biomarkers of kidney injury, inflammation, and oxidative stress in patients with diabetic nephropathy: A randomized, double-blind, placebo-controlled trial.

Khatami PG, Soleimani A, Sharifi N, Aghadavod E, Asemi Z.

Research Center for Biochemistry and Nutrition in Metabolic Diseases, Kashan University of Medical Sciences, Kashan, Iran; Department of Internal Medicine, Kashan University of Medical Sciences, Kashan, Iran.

**BACKGROUND:** Limited data are available that evaluated the effects of high-dose vitamin E supplementation on biomarkers of kidney injury, inflammation, and oxidative stress in patients with **diabetic nephropathy (DN)**.

**OBJECTIVE:** This study was conducted to evaluate the effects of high-dose vitamin E supplementation on biomarkers of kidney injury, inflammation, and oxidative stress in patients with DN.

**METHODS:** This randomized double-blind placebo-controlled clinical trial was carried out among 60 patients with DN. Patients were randomly allocated into two groups to take either 1200 IU/d of vitamin E supplements (n = 30) or placebo (n = 30) for 12 weeks. Fasting blood samples were obtained at the onset of the study and after 12-week intervention to assess biomarkers of kidney injury, inflammation, and oxidative stress.

**RESULTS:** After 12 weeks of intervention, compared with the placebo, vitamin E supplementation resulted in a significant increase in serum vitamin E levels ( $+42.3 \pm 13.4$  vs  $-0.8 \pm 0.8$  nmol/mL,  $P < .001$ ) and a significant decrease in urine protein ( $-6.8 \pm 4.3$  vs  $-1.0 \pm 8.0$  mg/dL,  $P = .001$ ) and protein-to-creatinine ratio ( $-0.2 \pm 0.1$  vs  $0.0 \pm 0.1$ ,  $P < .001$ ). In addition, a significant reduction in serum tumor necrosis factor- $\alpha$  ( $-35.4 \pm 34.9$  vs  $+5.6 \pm 6.2$  ng/L,  $P < .001$ ), matrix metalloproteinase-2 ( $-556.7 \pm 485.9$  vs  $+60.4 \pm 53.7$  ng/mL,  $P < .001$ ), matrix metalloproteinase-9 ( $-1461.5 \pm 1456.0$  vs  $+225.7 \pm 488.2$  ng/L,  $P < .001$ ), malondialdehyde ( $-0.9 \pm 0.5$  vs  $+0.3 \pm 0.4$   $\mu$ mol/L,  $P < .001$ ), advanced glycation end products ( $-1832.2 \pm 1941.6$  vs  $+177.3 \pm 324.1$  arbitrary unit,  $P < .001$ ), and insulin concentrations ( $-0.5 \pm 2.7$  vs  $+0.7 \pm 1.0$   $\mu$ IU/mL,  $P = .03$ ) was seen after the administration of vitamin E supplements compared with the placebo. Supplementation with vitamin E had no significant effects on other biomarkers of kidney injury, fasting plasma glucose, and insulin resistance compared with the placebo.

**CONCLUSION:** Overall, our study demonstrated that oral high-dose vitamin E supplementation for 12 weeks among DN patients had favorable effects on biomarkers of kidney injury, inflammation, and oxidative stress.

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