



Comment on: *Does Zinc Supplementation Affect Inflammatory Markers in Hemodialysis Patients?*

Jamshid Roozbeh, Maryam Pakfetrat, Alireza Hamidian Jahromi, Sanaz Shabani, Mohammad Mahdi Sagheb, Raha Afshariani, Maryam Sharifian & Oveis Salehi

To cite this article: Jamshid Roozbeh, Maryam Pakfetrat, Alireza Hamidian Jahromi, Sanaz Shabani, Mohammad Mahdi Sagheb, Raha Afshariani, Maryam Sharifian & Oveis Salehi (2011) Comment on: *Does Zinc Supplementation Affect Inflammatory Markers in Hemodialysis Patients?*, Renal Failure, 33:4, 466-467, DOI: [10.3109/0886022X.2011.568144](https://doi.org/10.3109/0886022X.2011.568144)

To link to this article: <https://doi.org/10.3109/0886022X.2011.568144>



Published online: 30 Apr 2011.



Submit your article to this journal [↗](#)



Article views: 1055



View related articles [↗](#)



Citing articles: 1 View citing articles [↗](#)

LETTER TO THE EDITOR

Comment on: *Does Zinc Supplementation Affect Inflammatory Markers in Hemodialysis Patients?*

Dear Sir

Zinc is a trace element essential for the action of many metallo-enzymes, which has an important role in polymeric organization of macromolecules such as DNA and RNA, protein synthesis, cell division, and gonad functions.^{1,2} Moreover, zinc is an essential micronutrient that can function as an anti-inflammatory and antioxidative agent.³ The relationship between antioxidant trace elements measured in the nail and the blood inflammatory markers' concentrations has been studied before.⁴ Therefore, antioxidant intake may be linked to a reduction of the chronic low-grade inflammatory state seen in different metabolic syndromes.⁴ In a recent study, Wang and colleagues⁵ suggested that multivitamin and mineral supplementation, for example, zinc, could have blood pressure lowering effect and could reduce serum C-reactive protein (CRP) in the women studied.

Furthermore, zinc supplementation causing an increase in serum zinc (Zn) concentration in the hemodialysis (HD) patients and the subsequent decrease in serum CRP was studied in a randomized, double-blinded, placebo-controlled clinical trial in our center recently.⁶ Zinc deficiency in the Middle East area and Iran is estimated to be seen in around 30% of healthy persons. It is even more common in chronic medical conditions, for example, renal failure patients on dialysis.^{7,8} The rate of zinc deficiency in patients with HD is about 40–78%.^{9–11}

In a prospective cohort study, the effects of oral zinc sulfate supplementation on serum CRP, erythrocyte sedimentation rate (ESR), and ferritin level in HD patients were studied. From 155 patients with end-stage renal disease on HD in the outpatient HD unit, 41 patients with low Zn level (Zn < 70 µg/mL) and normal serum iron were included in the study. For the purpose of this study, Zn levels were assessed using fasting plasma samples collected in acid-washed tubes. Zn was measured using the atomic absorption method

in the same laboratory for all of the patients. We also checked the plasma levels of CRP, ESR, and ferritin. Patients with signs of iron deficiency anemia, hemoglobin <7 mg/dL, and hypocalcemia (corrected serum calcium level <7) were excluded from the study.¹² The patients received oral zinc supplement [zinc sulfate, (250 mg/day); Alhavi Pharmaceutical, Tehran, Iran] for 6 weeks. Levels of Zn, CRP, ESR, ferritin, and BUN were rechecked after 6 weeks. Parametric data are presented as mean [standard deviation (SD)]. The variables were analyzed using SPSS 15 software.

Mean age of 38 patients who completed the study (three patients with noncompliance) was 53.2 years (SD: 18.5; range: 21–83). Mean duration of dialysis in these patients was 12.1 months (range: 3–51). Mean Zn concentration for the subjects increased from 53.27 µg/mL (SD: 15.27) to 80.38 µg/mL (SD: 20.54) after 42 days of zinc supplementation ($p < 0.05$). Serum CRP decreased significantly during the same period ($p < 0.05$) although we did not detect a significant change in serum ESR, ferritin, and BUN levels (Table 1).

Oxidative stress and chronic inflammation are important factors in the pathophysiology of many chronic diseases, for example, atherosclerosis, neurological and malignant disorders, autoimmune- and HD-dependant end-stage renal diseases.¹³ Zinc as an anti-inflammatory agent can decrease the oxidative stress and inflammatory cytokine generation.¹³ It has been shown that concurrent zinc deficiency changes the expected clinical picture in many diseases and will affect cell-mediated immunity and the generation of inflammatory cytokines in the patients.¹³ Zinc supplement decreasing CRP, lipid peroxidation, and inflammatory cytokines in the elderly subjects have been reported before.³ Zinc supplementation may also decrease inflammation in HD patients.⁶ In this study although zinc supplement did not have significant effect on plasma levels of ESR and ferritin as

Table 1. Variables before and after intervention.

| | Before intervention, mean (SD) | After intervention, mean (SD) | <i>p</i> -Value |
|---------------------------------------|--------------------------------|-------------------------------|-----------------|
| Plasma zinc level (µg/mL) | 53.27 (15.27) | 80.38 (20.54) | $p < 0.05$ |
| Serum ferritin level (mg/dL) | 377.2 (181.9) | 339.1 (128.6) | $p > 0.05$ |
| Plasma BUN level (mg/dL) | 52.3 (29.1) | 55.9 (31.4) | $p > 0.05$ |
| Erythrocyte sedimentation rate (mm/h) | 73.6 (11.4) | 70.2 (13.5) | $p > 0.05$ |
| C-reactive protein level (mg/L) | 16.8 (2.2) | 12.6 (3.7) | $p < 0.05$ |

inflammatory factors in HD patients, it caused a significant decrease in CRP. Accordingly, administration of zinc supplement in HD patients may decrease chronic inflammation in some but not in all the aspects.

Jamshid Roozbeh
Department of Internal Medicine
Shiraz University of Medical Sciences
Urology Nephrology Research Center
Shiraz, Iran
E-mail: roozbehj@hotmail.com

Maryam Sharifian
Department of Neurology
Shiraz University of Medical Sciences,
Shiraz, Iran
E-mail: maryam_sharifian@yahoo.com

Mohammad Mahdi Sagheb
Department of Internal Medicine
Shiraz University of Medical Sciences
Urology Nephrology Research Center,
Shiraz, Iran
E-mail: saghebf@yahoo.com

Sanaz Shabani
Department of Internal Medicine
Shiraz University of Medical Sciences
Urology Nephrology Research Center,
Shiraz, Iran
E-mail: shabanis@sums.ac.ir

Alireza Hamidian Jahromi
Renal Transplant Unit, St George's Hospital,
London, UK
E-mail: alirezahamidian@yahoo.com

Raha Afshariani
Department of Public Health, School of Health and
Nutrition, Shiraz University of Medical Sciences,
Shiraz, Iran
E-mail: afsharianir@sums.ac.ir

Maryam Pakfetrat
Department of Internal Medicine
Shiraz University of Medical Sciences

Urology Nephrology Research Center,
Shiraz, Iran
E-mail: pakfetratm@sums.ac.ir

Oveis Salehi
Department of Internal Medicine
Hormozgan University of Medical Sciences,
Bandar Abbas, Iran
E-mail: oveissalehi@yahoo.com

REFERENCES

- [1] Erten Y, Kayutey M. Zinc deficiency prevalence and causes in hemodialyzed patients and effect on cellular immune response. *Transplant Proc.* 1998;30:850–885.
- [2] Smith OB, Akinbamizo OO. Micronutrients and reproduction in farm animals. *Anim Reprod Sci.* 2000;60–61: 549–560.
- [3] Bao B, Prasad AS, Beck FW, et al. Zinc decreases C-reactive protein, lipid peroxidation, and inflammatory cytokines in elderly subjects: A potential implication of zinc as an atheroprotective agent. *Am J Clin Nutr.* 2010;91(6):1634–1641.
- [4] Puchau B, Zulet MA, Hermisdorff HH, Navarro-Blasco I, Martinez JA. Nail antioxidant trace elements are inversely associated with inflammatory markers in healthy young adults. *Biol Trace Elem Res.* 2010;133(3):304–312.
- [5] Wang C, Li Y, Zhu K, Dong YM, Sun CH. Effects of supplementation with multivitamin and mineral on blood pressure and C-reactive protein in obese Chinese women with increased cardiovascular disease risk. *Asia Pac J Clin Nutr.* 2009;18(1):121–130.
- [6] Rashidi AA, Salehi M, Piroozmand A, Sagheb MM. Effects of zinc supplementation on serum zinc and C-reactive protein concentrations in hemodialysis patients. *J Ren Nutr.* 2009;19(6):475–478.
- [7] Parsad AS. Recognition of zinc deficiency syndrome. *Nutrition.* 2001;17:69–76.
- [8] Jalali GR, Roozbeh J, Mohammadzadeh A, et al. Impact of oral zinc therapy on the level of sex hormones in male patients on hemodialysis. *Ren Fail.* 2010;32(4):417–419.
- [9] Vanholder R, Cornelis R. The role of trace elements in uremic toxicity. *Nephrol Dial Transplant.* 2002;17(Suppl. 2):2–8.
- [10] Lee SH, Huang JW. Trace metals abnormalities in hemodialyzed patients, relationship with medications. *Artic Organs.* 2000;24(11):841–844.
- [11] Roozbeh J, Hedayati P, Sagheb MM, et al. Effect of zinc supplementation on triglyceride, cholesterol, LDL, and HDL levels in zinc-deficient hemodialysis patients. *Ren Fail.* 2009;31(9):798–801.
- [12] Bathon J, Graves J, Jens P, Hamrick R, Mayes M. The erythrocyte sedimentation rate in end-stage renal failure. *Am J Kidney Dis.* 1987;10(1):34–40.
- [13] Prasad AS. Impact of the discovery of human zinc deficiency on health. *J Am Coll Nutr.* 2009;28(3):257–256.