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ORIGINAL RESEARCH COMMUNICATION

Zinc supplementation decreases incidence of infections in the elderly: effect of zinc on generation of cytokines and oxidative stress[1,2,3]

Ananda S Prasad[1], Frances WJ Beck[1], Bin Bao[1], James T Fitzgerald[1], Diane C Snell[1], Joel D Steinberg[1] and Lavoisier J Cardozo[1]

[1] From the Wayne State University School of Medicine, Detroit, MI (ASP, FWJB, BB, DCS, JDS, and LJC), and the University of Michigan, Ann Arbor, MI (JTF)

Background: Zinc deficiency, cell-mediated immune dysfunction, susceptibility to infections, and increased oxidative stress have been observed in elderly subjects (ie, those >55 y old). Zinc is an effective antiinflammatory and antioxidant agent.

Objectives: The primary objective was to determine the effect of zinc on the incidence of total infections in healthy elderly subjects. The secondary objective was to determine the effect of zinc on cytokines and oxidative stress markers.

Design: A randomized, double-blind, placebo-controlled trial of zinc supplementation was conducted in elderly subjects. Fifty healthy subjects of both sexes aged 55–87 y and inclusive of all ethnic groups were recruited for this study from a senior center. The zinc-supplemented group received zinc gluconate (45 mg elemental Zn/d) orally for 12 mo. Incidence of infections during the supplementation period was documented. The generation of inflammatory cytokines, T helper 1 and T helper 2 cytokines, and oxidative stress markers and the plasma concentrations of zinc were measured at baseline and after supplementation.

Results: Compared with a group of younger adults, at baseline the older subjects had significantly lower plasma zinc, higher ex vivo generation of inflammatory cytokines and interleukin 10, and higher plasma oxidative stress markers and endothelial cell adhesion molecules. The incidence of infections and ex vivo generation of tumor necrosis factor α and plasma oxidative stress markers were significantly lower in the zinc-supplemented than in the placebo group. Plasma zinc and phytohemagglutin-induced interleukin 2 mRNA in isolated mononuclear cells were significantly higher in the zinc-supplemented than in the placebo group.

Conclusions: After zinc supplementation, the incidence of infections was significantly lower, plasma zinc was significantly higher, and generation of tumor necrosis factor α and oxidative stress markers was significantly lower in the zinc-supplemented than in the placebo group.

Key Words: Elderly subjects • infections • interleukin 2 mRNA • zinc • oxidative stress • tumor necrosis factor α • interleukin 1ß

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