

Study shows zinc supplement boosted serum zinc levels and immunity in older adults

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The immune system weakens as the body ages, making older adults more susceptible to infections. Low levels of zinc impair immunity, particularly in older adults. A research team set out to determine if it was feasible to increase serum zinc concentrations in older adults in nursing homes who were zinc-deficient. Their work appears today in *The American Journal of Clinical Nutrition*.

"Our previous work showed that 30 percent of nursing home residents have low serum zinc levels and those with low serum zinc levels had a significantly higher incidence of pneumonia and morbidity from it. Our new finding that serum zinc levels can be improved in older adults with [zinc supplementation](#) and that this is associated with enhancement of T-cell numbers and function strongly suggests that ensuring adequate zinc consumption by older adults could have a significant impact on reducing the incidence of and morbidity from infection, which is a major public health problem in older adults," said the study's lead author, Simin Nikbin Meydani, D.V.M., Ph.D., the director of the Jean Mayer USDA Human Nutrition Research Center on Aging (HNRCA) at Tufts University in Boston, and senior scientist and director of its Nutritional Immunology Laboratory.

The small double-blind, placebo-controlled trial involved adults age 65 or older from three Boston-area nursing homes. The study participants had baseline serum levels of zinc that ranged from moderately to very zinc-deficient. Participants were given [zinc supplements](#) or a placebo for three months. A total of 25 people completed the study, with 13

receiving the placebo (a daily multi-vitamin with only 5 mg of zinc), and 12 receiving a daily multi-vitamin with 30 mg of zinc. A serum-level of 70 micrograms per deciliter was used as the cut-off standard for adequate serum zinc level and measuring improvement from supplementation. The function of the immune response was assessed by determining the immune cell profile and function.

In addition to serum zinc concentrations, the researchers found that zinc supplementation improved the function of T-cells as determined by their ability to proliferate in response to stimuli that mimicked infection. Furthermore, they saw a positive correlation between serum zinc levels and the number and function of T-cells. This effect of zinc was attributed to increasing the number of T-cells rather than enhancing the function of each T-cell. At the end of three months, researchers found that:

- Zinc supplementation increased serum zinc concentrations in nursing home residents with low zinc levels.
- Zinc supplementation increased both the number and effectiveness of T-cells in the treatment group at a much higher rate than the control group
- The increase of serum zinc rose higher in the treatment group, at a rate of 16 percent, compared to those in the control group, which rose at a rate of 0.7 percent.
- For those in the treatment group who were moderately zinc-sufficient at baseline, their serum zinc levels exceeded the cut-off standard.
- Participants in the treatment group whose serum levels were measured as substantially zinc-deficient at baseline did not experience an increase to normal levels during the trial.

"Having a positive response to zinc supplementation may take some time in people who have been highly zinc deficient. We need to better

understand how much supplementation is needed for certain people, and for how long a period, so that more refined recommendations can be made," added first author Junaidah B. Barnett, M.C.H. (N), Ph.D., scientist in the Nutritional Immunology Laboratory at the HNRCA.

"It is worth noting that [zinc deficiency](#) is not just a problem in nursing home residents; it also exists in non-institutionalized older adults," Meydani continued. "On average, zinc supplementation measurably improved serum zinc levels in these older adults, with most participants achieving serum zinc levels considered to be adequate."

Zinc is found in a wide variety of foods, including oysters, pork, red meat, poultry, seafood, and fortified breakfast cereals. Zinc is also found in beans, nuts, whole grains, cucumber peel, and dairy products and is common in multi-vitamins. The Office of Dietary Supplements of the National Institutes of Health notes that zinc deficiency is rare in North America, but that some groups of people are more likely to have trouble getting enough zinc, including those with digestive disorders and vegetarians. Too much zinc (the upper limit for adults is 40 mg/day) can be harmful. Some researchers suspect, however, the [older adults](#) do not absorb or use zinc as efficiently as others. In addition, while serum zinc levels are a commonly used measure to evaluate zinc deficiency, they might not accurately reflect cellular zinc status. Some cells might exhibit low zinc levels, which impacts their function, even when serum [zinc](#) levels are normal.

More information: Barnett JB, Dao MC, Hamer DH, Kandel R, Brandeis G, Wu D, Dallal GE, Jacques PF, Schreiber R, Kong E, Meydani SN. Effect of zinc supplementation on serum zinc concentration and T cell proliferation in nursing home elderly: a randomized, double-blind, placebo-controlled trial. *American Journal of Clinical Nutrition* 2016 Jan 27, Epub ahead of print; [DOI: 10.3945/ajcn.115.115188](#)

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