

PubMed

Format: Abstract

J Am Coll Nutr. 2007 Feb;26(1):1-9.

Effect of dietary phytate on zinc homeostasis in young and elderly Korean women.

Kim J¹, Paik HY, Joung H, Woodhouse LR, Li S, King JC.

Author information

Abstract

BACKGROUND: Previous studies suggest that consumption of predominantly plant-based diets with high phytate content contribute to zinc deficiency by inhibiting zinc absorption. Age of the individual may also affect the ability to maintain zinc homeostasis.

OBJECTIVE: This study was designed to determine the effect of dietary phytate on zinc homeostasis and to evaluate the effect of age on the capacity to maintain the zinc homeostasis with changes in dietary phytate in young and elderly Korean women.

DESIGN AND METHODS: Seven healthy young women (22-24 yr) and 10 healthy elderly women (66-75 yr) were studied consecutively for 3 months in 2 metabolic periods (MP) in two different metabolic units. During MP1 the women consumed a high phytate (HP) diet (P:Zn molar ratio = 23) for 9 days. After a 10 d wash-out period at home eating their usual diets, a lower phytate diet (LP) (P:Zn molar ratio = 10) was fed in MP2 for 9 d. Phytase was added to selected foods in the high phytate diet to reduce the phytate content of the meals in the LP period. The zinc content of both diets was about 6.5 mg/d. Stable isotopes of Zn (⁷⁰Zn) were administered intravenously on d 5 of MP 1 and 2 for measuring endogenous fecal zinc excretion. Plasma samples were also collected on d 5 for measuring plasma zinc concentrations by Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES). 24 hr urine samples were collected for 5 d and complete fecal samples were collected for 9 d after isotope administration. Fractional zinc absorption (FZA) was calculated from mass balance corrected for endogenous fecal zinc (EFZ) excretion and EFZ was determined by using an isotopic dilution technique. Isotopic ratios for FZA and EFZ were measured by Inductively Coupled Plasma-Mass Spectrometry (ICP-MS). Statistical analyses were done using ANOVA.

RESULTS: Both the young and elderly women were in negative zinc balance during the HP period. This was due to a significant decrease in FZA and total absorbed zinc (TAZ) with a HP diet (43 vs 22% in young women, 34 vs 20% in elderly women, $p < 0.001$). EFZ excretion did not differ in the young and elderly women during the LP and HP periods. Dietary phytate did not alter plasma zinc concentrations or and urinary zinc excretion in either group.

CONCLUSIONS: Adjustments in zinc homeostasis with an increase in dietary phytate did not differ between young and elderly women in this study.

PMID: 17353577

[Indexed for MEDLINE]

Publication types, MeSH terms, Substances LinkOut - more resources

PubMed Commons

0 comments

[PubMed Commons home](#)

[How to join PubMed Commons](#)