

STUDIES ON THE INTESTINAL INTERACTION OF ZINC AND IRON IN MAN  
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A competitive interaction between zinc and iron has been demonstrated in perfused murine intestinal segments (Hamilton DL, et al, *Can J Physiol Pharmacol* 56:384, 1978). We have performed studies in human subjects to characterize the effect of iron on the absorption of zinc. The change in plasma zinc after an oral dose of zinc sulfate was used as the index of zinc absorption. The rate of rise in plasma zinc following a 25 mg dose of zinc (as 110 mg of  $ZnSO_4 \cdot 7H_2O$ ) was not affected by simultaneous ingestion of 25 mg of iron (as 124 mg of  $FeSO_4 \cdot 7H_2O$ ), a Fe/Zn ratio of 1:1. On the other hand, 50 and 75 mg of ferrous iron, Fe/Zn ratios of 2:1 and 3:1, respectively, resulted in progressive inhibition of zinc absorption. As iron from dietary hemoglobin and myoglobin has been shown to comprise a distinct absorptive pool, 75 mg of iron, in a Fe/Zn ratio of 3:1, was administered in the form of heme chloride; no significant inhibition of the increment in plasma zinc was seen. It can thus be concluded that nonheme, but not heme, iron competitively inhibits the intestinal absorption of zinc in man in accordance with its behavior in a murine model. Of 24 vitamin-mineral supplements listed in the *Physician's Desk Reference*, 21 had a Fe/Zn ratio of greater than 3:1, suggesting intrinsic interference with the biological availability of zinc. In infant formula and drugs, concern for relative content of zinc and iron is real.

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