

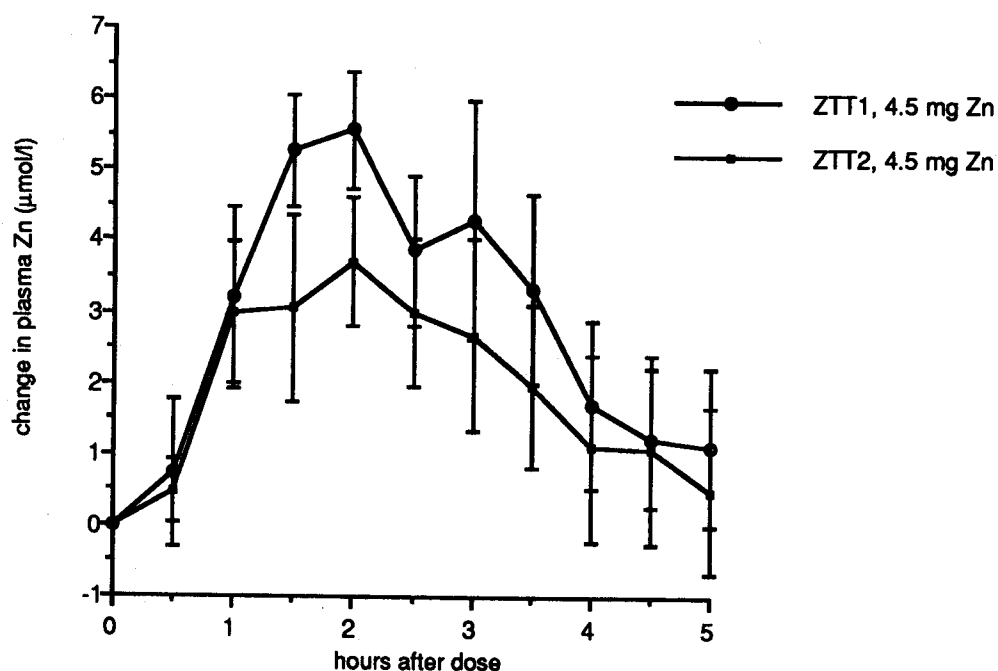
VARIABILITY OF THE PLASMA RESPONSE TO A PHYSIOLOGICAL DOSE OF ZINC IN HEALTHY SUBJECTS

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The acute plasma zinc response to a zinc challenge, known as the zinc tolerance test (ZTT), is used to measure zinc absorption. Although this procedure has practical advantages, one concern has been the large magnitude of the zinc dose (25-50 mg elemental zinc). The aims of this study were to quantitate the response to a small zinc challenge and to determine its reproducibility.

Five female subjects, in the fasted state, were asked to consume 4.5 mg zinc (as 20 mg zinc sulphate). Venous blood samples were obtained at 30 min intervals for 5 hours while the subjects were sedentary. The procedure was repeated in the same volunteers 12-16 days later under the same conditions. Plasma zinc concentration was determined by inductively coupled plasma emission spectroscopy.

Plasma zinc increased significantly above baseline in all subjects on both occasions (see figure below).



The magnitude of the response varied such that the area under the plasma zinc curve was 30% lower after the second ZTT compared with the first (11.0 ± 3.3 vs 15.8 ± 3.8 mmol.h/l, mean \pm SEM). The difference in response could be explained partly (52%) by differences in the fasting plasma zinc levels (12.9 ± 1.0 vs 15.1 ± 1.2 mmol/l, ZTT 1 vs ZTT 2) but was unrelated to technical inconsistencies as the within-run coefficient of variation of plasma zinc measurement was less than 5%. These results suggest that a small dose of zinc, equivalent to 38% of the RDI, can be utilised effectively in ZTT procedures however, experiments must be designed to take into account the large variability in the response.

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