

Olivares, M., F. Pizarro, H. Speisky, B. Lonnerdal, and R. Uauy. 1998. Copper in infant nutrition: safety of World Health Organization provisional guideline value for copper content of drinking water. *J Pediatr. Gastroenterol. Nutr.* 26:251-257.

Abstract:

BACKGROUND: Copper is an essential nutrient for humans. Recently, a limit of 31.48 micromol/l (2 mg/l) was proposed by the World Health Organization as the provisional guideline value for copper content of drinking water. The objective of the study was to determine the tolerance of chronic exposure to drinking water with low or high copper content in infants.

METHODS: Healthy infants (n = 128) were randomly assigned to receive drinking water with less than 1.57 micromol/l (<0.1 mg/l) (n = 48) or 31.48 micromol/l (2 mg/l) of copper (n = 80) from 3 to 12 months of age. At 6, 9, and 12 months of age, serum concentrations of copper, ceruloplasmin, and superoxide dismutase; erythrocyte metallothionein; bilirubin; transaminases; and gamma-glutamyl transferase were measured. **RESULTS:** Small differences in biochemical indexes of copper nutrition were observed between the groups, but there was no evidence of adverse or toxic effects. These findings may be explained by an adaptive response to the higher copper intake, limiting copper absorption, and increasing biliary secretion, as well as by an increase in copper storage. It is also possible that the sensitivity of the biochemical indicators employed to detect differences in copper status is limited.

CONCLUSION: No acute or chronic adverse consequences of consuming water with copper content of 31.48 micromol/l (2 mg/l) were detected in infants during the first year of life. The results support the safety of the World Health Organization's provisional guideline value for copper in drinking water during infancy.