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Zinc and copper status, and copper/zinc ratio in a series of cystic fibrosis patients

Abstract:

Cystic fibrosis (CF) is a chronic disease that affects all areas of life and may require a supply of essential micronutrients such as zinc (Zn) and copper (Cu). Thus, the main aim of this cross-sectional study was to evaluate serum Zn and Cu levels, serum Cu/Zn ratios and their relationship with nutritional indicators in a group of CF patients. We assessed phenotypical features, clinical and biochemical tests (Zn and Cu levels by atomic absorption spectrophotometry) and dietary Zn intake (prospective dietary surveys of 72 hours, including a weekend day). Seventeen CF patients participated (76% Delta F580 mutation, 59% women). The mean serum Zn (87 $\mu\text{g}/\text{dL}$) and Cu (113 $\mu\text{g}/\text{dL}$) levels and dietary Zn intake (97% of Dietary Reference Intake) were normal. There was a meaningful association between serum Cu and Zn levels. 18% of CF had hypozincemia, and 23% had dietary Zn deficiency. Only one adolescent had hypocupremia, and two children had hypercupremia. No patient with dietary Zn deficiency had hypozincemia, suggesting that probably 41% of the cases were at elevated risk of Zn deficiency. No patient with hypozincemia had abnormal Cu levels. 94% of CF cases with a Cu/Zn ratio >1.00 indicate the state of inflammation and should alert us to consider the risk of Zn deficiency in these patients. Serum Zn by itself may not show a person's Zn status. Nonetheless, the Cu/Zn ratio could be helpful as a biomarker of an inflammatory state due to the underlying disease or zinc deficiency in CF patients.

Biography

Marlene is a pediatrician and a Doctor of Medicine, a researcher at the Faculty of Medicine of the University of Valladolid, Spain. She has a doctorate in "Health Sciences Research" and two master's degrees, one in "Clinical Nutrition" and the other in "Biological Aspects of Nutrition". Nowadays, that doctor works as a peer reviewer for the MDPI, Springer Nature, International Journal of Environmental Research, Wiley, Public Health and Medicine, etc. She is interested in food safety and food biofortification. Her research field is micronutrient deficiencies and the nutritional status of patients with malnutrition and chronic diseases.