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# STUDY ON THE RELATIONSHIP BETWEEN SOME TRACE MINERAL ELEMENTS AND ANTIOXIDANT ENZYMES AMONG UNDER-FIVE CHILDREN WITH PROTEIN-ENERGY MALNUTRITION

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**Background:** The devastating effects of protein energy malnutrition (PEM) among children below age 5-years have been linked with increased free radical toxicity. The ability of antioxidant enzymes to scavenge these free radicals depends on some trace mineral elements.

**Method:** This study therefore investigated the relationship between some trace elements and endogenous antioxidant enzymes in 98 under-five children with protein-energy malnutrition (PEM) and 98 age and sex-matched apparently healthy children (control). Venous blood (2ml) was collected from all subjects for biochemical analysis using standard methods.

**Results:** Results obtained show that mean serum total protein ( $55.76 \pm 3.95$ ) and albumin ( $26.43 \pm 2.78$ ) levels and superoxide dismutase (SOD) ( $1.87 \pm 0.32$ ) and glutathione peroxidase (GPx) ( $42.38 \pm 5.03$ ) activities in malnourished children were significantly lower ( $p < 0.05$ ) than in the control. Mean serum zinc (Zn) concentrations ( $8.37 \pm 4.25$ ) in malnourished children were significantly higher ( $p < 0.05$ ) than in the control ( $5.14 \pm 2.39$ ), but mean serum copper (Cu) concentrations in malnourished ( $2.40 \pm 1.12$ ) children were lower than in the control ( $2.82 \pm 1.18$ ). There were correlations between these serum levels of trace elements (Zn and Cu) and antioxidant enzymes (SOD and GPx) in children with PEM and control. Marasmus (SOD-Zn: 0.03, SOD-Cu: 0.16, GPx-Zn: -0.14, GPx-Cu: 0.05), kwashiorkor (SOD-Zn: -0.39, SOD-Cu: -0.39, GPx-Zn: -0.54, GPx-Cu: -0.31), marasmic-kwashiorkor (SOD-Zn: -0.31, SOD-Cu: -0.51, GPx-Zn: -0.41, GPx-Cu: -0.48) and control (SOD-Zn: 0.12, SOD-Cu: 0.07, GPx-Zn: -0.07, GPx-Cu: -0.08).

**Conclusion:** This study reveals that children with PEM are predisposed to high oxidative stress due to increase in free radical production and decrease in antioxidant defense system. Therefore, routine laboratory investigation of antioxidants should be conducted for effective management of PEM.

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