

ABSTRACT

Red cell superoxide dismutase activity (CuSODA) is thought to be influenced by dietary intakes of copper. To test this hypothesis CuSODA was measured in the newly formed cells of fifteen severely malnourished children, given either a basal diet or the basal diet and copper supplements, during recovery from PEM. Cells were density fractionated using a discontinuous density gradient of Percoll. Published methods were inadequate hence a new method was developed. A density gradient of Percoll containing thirteen different layers, with a density range of 1.076 g/ml to 1.108 g/ml, was used to fractionate red cells from the severely malnourished children. CuSODA and hemoglobin levels were measured in each fraction of cells.

No differences were found in the CuSODA of children given a copper supplement, in addition to their regular feeds, and children not given a copper supplement. There was a rapid proliferation of new cells approximately two weeks after admission, in both groups. At discharge this reverted to a normal distribution skewed to the right, similar to the pattern at admission.

It is concluded that (1) severely malnourished Jamaican children are not generally copper deficient, (2) diets given during rehabilitation are sufficient to prevent clinical copper deficiency, and (3) the response to dietary intakes of copper by red cell superoxide dismutase is variable and may involve a reconstitution of an apo-enzyme.