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PROTEIN, ENERGY, ZINC, IRON AND VITAMIN A NUTRITURE IN CHILDREN (3-5 YEARS) OF LOW SOCIO-ECONOMIC STATUS IN KANDY, SRI LANKA

A THESIS PRESENTED BY

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PROTEIN, ENERGY, ZINC, IRON AND VITAMIN A NUTRITURE IN CHILDREN (3-5 YEARS) OF LOW SOCIO-ECONOMIC STATUS IN KANDY, SRI LANKA

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This study was undertaken to assess the micronutrient adequacy, with special reference to zinc (Zn) in rural children (3-5 y, n=160), whose diets were primarily cereal based. The dietary intakes of children were assessed qualitatively (24 hour recall, n=68; Food frequency questionnaire, n=50) and quantitatively (n=21). Micronutrient levels in blood and hair were assessed and followed by a Zn supplementation study to see whether undernutrition could be corrected.

Anthropometric assessment at baseline (n=137) showed that the z scores of boys for stunting and underweight indices were significantly (p=0.01) lower than that of girls. Compared to the recommended daily intake, the mean energy intake was 89%, whereas protein intake was two fold higher. Micronutrient and calcium intakes were inadequate.

The mean biochemical indices measured (plasma Zn, hair Zn, Ferritin, hemoglobin, and retinal binding protein) were above the cut off levels but the percentage of children below the cutoff levels for the two Zn indices were 25% and 38% respectively. Similarly, 40% of the children were anaemic.

The main sources of Zn and iron (Fe) nutriture were rice (0.54 to 1.46 mg/100 g; 0.54 to 1.46 mg/100 g), wheat flour (0.21 to 0.96 mg/100 g and 0.12 to 6.25 mg/100 g). Green leaves contributed to the rest. Phytic acid (antinutrient) level was high in the diet and may have contributed to micronutrients being less bioavailable.

Zn supplementation did not benefit the children of this study. One of the major constraints was that children dropped out resulting in a small sample size (n=106) for analysis. In general, the nutrient supplementation that was given to both Zn and placebo groups appeared to have corrected the clinical signs and symptoms and reduced specific deficiencies at an individual level. For example, in both Zn and placebo groups, the Zn status of children at below cut off improved after nutrient supplementation. It appears that Zn deficiency is not a major problem in this sample. However, a larger sample should be assessed before making a final conclusion. The existence of multimicronutrient deficiencies is suggestive. Although nutrient supplementation did correct some biochemical indices, it was not reflected in the status of anthropometry. It is prudent to assume multimicronutrient deficiencies and attempt dietary interventions rather than artificial supplementation.

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