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Efficacy of micronutrient supplement in reducing the prevalence of anaemia and zinc deficiency among school children in Galle

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Micronutrient deficiencies present a major obstacle to socio-economic development and productivity in developing countries. Combining multiple micronutrients in a single delivery system has been suggested as a cost-effective strategy to alleviate this problem. Schoolchildren (n=821) of 12 to16 years of age attending schools in the Galle District were randomized into four groups and supplemented with Group 1)-iron (50 mg/d) in the form of ferrous fumarate; Group 2)-zinc (14 mg/d) as zinc sulfate; Group 3)-combined iron+zinc (50+14 mg/d); Group 4)-placebo capsule made of anhydrous lactose, for five days a week over a period of 24 weeks. Their anthropometry, haemoglobin, serum zinc and ferritin levels were assessed before and after the intervention. 774 children (94.3% of initial enrollment) completed the study. Weight and height of the iron, zinc, combined and placebo groups had increased on average by 0.47 (±0.60), 1.12 (±0.79), 0.78 (±0.78) and 0.26 (±0.45) Kg (MANOVA, $p<0.001$ all groups) and by 0.45 (±0.43), 1.20 (±0.86), 0.78 (±0.63) and 0.41 (±0.34) cm (MANOVA, $p<0.01$ all groups) respectively. After correcting confounding influences of age and the respective baseline values, zinc supplemented group had shown better anthropometric improvement over the period. The iron only group had the highest increase in mean haemoglobin (18.19 g/L) while the combined group had 11.07 g/L and zinc group had a 7.70 g/L during the intervention (MANOVA, $p<0.001$, all groups). There was no difference in serum zinc status between zinc and combined groups (4.29 and 3.95 μmol/L; MANOVA, $p=1.0$). Iron group showed a mean increase of 39.15 μg/L of serum ferritin; whereas the improvement in the combined group was 32.22 μg/L (MANOVA, $p<0.05$). This study showed that micronutrient supplementation had a positive effect on growth during the childhood and effective in reducing the prevalence of anaemia. Iron supplementation was not shown to negatively impact on plasma zinc concentrations, and supplementation with zinc did not increase the prevalence of anemia or iron deficiency anemia.

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