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Effect of the provision of a macro- and micro-nutrient fortified complementary food supplement on nutritional status of Ghanaian infants

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Abstract

Background

Only 13% of Ghanaian infants 6–23 months have a minimum acceptable diet. The study examined the effect of a macro- and micro-nutrient fortified complementary food supplement (KokoPlus™) on growth and nutritional status of Ghanaian infants.

Methods

In a cluster randomized study, 38 communities were randomly assigned to three arms: KokoPlus™ and nutrition education (KP), Micronutrient powder and nutrition education (MN) and Nutrition education alone (NE) (n=301 infants/group). KP and MN received the same micronutrient dosage. Supplements were to be delivered weekly with instructions to use one sachet daily. Monthly nutrition education sessions included recipe demonstration and emphasized breastfeeding, complementary feeding and WASH practices. Baseline (B), midline (M) and endline (E) data collected at 6, 12 months and 18 months of age respectively. Research protocol included a venous blood draw, dietary assessment, SE status, morbidity, WASH and food security at B, M and E, monthly anthropometry assessments and weekly morbidity assessment and compliance with protocol. Length for age (LAZ), Weight for age (WAZ) and Weight for height (WLZ) Z-scores were computed using the 2006 WHO-MGRS growth reference. Serum hemoglobin, retinol binding protein, ferritin, zinc, C-reactive protein and alpha glycoprotein, IGF-1 and cortisol were assessed. Iron markers were corrected for infection. Analysis was intent to treat and included post hoc compliance modeling with mixed effects linear regressions adjusting for community clustering, age, baseline outcome measure, maternal height or maternal BMI.

Results

Mean LAZ scores at B time point were -0.74 ± 1.02 , -0.74 ± 0.97 and -0.64 ± 1.01 and E time point were -1.219 ± 0.06 , 1.211 ± 0.03 , and -1.266 ± 0.03 in groups KP, MN and NE respectively. At E, serum hemoglobin was significantly higher in the KP (114.02 ± 1.87 g/L) than MN (107.8 ± 2.5 g/L) or NE (108.8 ± 0.99 g/L) correcting for acute infection. Compliance (% of delivered supplement consumed) for KP and MN were 86.2% and

Conclusions

A macronutrient-micronutrient fortified complementary food supplement significantly improved hemoglobin in infants with no acute infection but showed no significant difference in LAZ scores. Modeling using intended delivery rates and observed compliance shows significant improvement in LAZ and serum zinc implying a dose response effect of the intervention. Further work optimizing delivery and uptake of this intervention is required to validate this finding.

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