TreatFOOD study in Burkina Faso

Summary of presentation[1] of published research[2]

By Susan Shepherd

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The TreatFOOD study was conducted in Burkina Faso from 2013-2015 by ALIMA and the University of Copenhagen with support from the World Food Programme (WFP), DANIDA, European Civil Protection and Humanitarian Aid Operations (ECHO), Médecins Sans Frontières (MSF) and the Arvid Nilssons Fond. The main objective of the study was to assess the effectiveness of a three-month supplementation with newly developed food supplements for the management of children aged 6-23 months with moderate acute malnutrition (MAM) in Burkina Faso. As of 2017, ten publications have resulted from the study. Highlights of key results were presented, including most recently published findings.

Method

Children with MAM were treated with lipid-based nutrient supplement (LNS) or corn-soy blend (CSB). Investigators assessed the effectiveness of (a) matrix (LNS or CSB); (b) soy quality (soy isolate) (SI) or de-hulled soy (DS); and (c) percentage of total protein from dry skimmed milk (0 per cent, 20 per cent, or 50 per cent), in increasing fat-free tissue accretion. Primary outcome was the effect on accrual of fat-free (lean body) mass; secondary outcomes included linear growth, recovery rate, physical activity, motor milestones, morbidity, food supplement acceptability, haemoglobin concentration, serum acute phase proteins, IGF-1, serum ferritin, essential fatty acid concentrations and thymus size.

Between 9 September 2013 and 29 August 29 2014, a randomised 2 × 2 × 3 factorial trial recruited children aged 6 to 23 months with MAM (defined by mid-upper arm circumference (MUAC) ≥115 mm and < 125 mm and/or weight-for-height z-score (WHZ) ≥-3 and < -2) in Burkina Faso. The intervention comprised 12 weeks of food supplementation providing 500 kcal/day as LNS or CSB, each containing SI or DS, and 0 per cent, 20 per cent or 50 per cent of protein from milk. Fat-free mass (FFM) was assessed by deutrium dilution technique. By dividing FFM by length squared, the primary outcome was expressed independent of length as FFM index (FFMI) accretion over 12 weeks.

Findings

Of the 1,609 children recruited into the study, four died, 61 were lost to follow-up and 119 were transferred out due to supplementation being switched to non-experimental products[3]. No children developed allergic reaction. At inclusion, 95 per cent were breastfed and mean (SD) weight was 6.91 kg (0.93), with 83.5 per cent (5.5) FFM. In the whole cohort, weight increased 0.90 kg (95 per cent confidence interval (CI) 0.88, 0.93; p < 0.01) comprising 93.5 per cent (95 per cent CI 89.5, 97.3) FFM. Compared to children who received CSB, FFMI accretion was increased by 0.083 kg/m2 (95 per cent CI 0.003, 0.163; p = 0.042) in those who received LNS. In contrast, SI did not increase FFMI compared to DS (mean difference 0.038 kg/m2; 95 per cent CI –0.041, 0.118; p = 0.35), irrespective of matrix. There was no effect modification by season, admission criteria, baseline FFMI, stunting, inflammation, or breastfeeding (p > 0.05). LNS compared to CSB resulted in 128g (95 per cent CI 67, 190; p < 0.01) greater weight gain if both contained SI, but there was no difference between LNS and CSB if both contained DS (mean difference 22g; 95 per cent CI –40, 84; p = 0.49) (interaction p = 0.017). Accordingly, SI compared to DS increased weight by 89g (95 per cent CI 27, 150; p = 0.005) when combined with LNS, but not when combined with CSB.

A limitation of this and other food supplementation trials is that it is not possible to collect reliable data on individual adherence. In addition, the study was under-powered in terms of detecting any statistically significant difference in milk content.

Conclusion and reflections

In this study, children with MAM mainly gained FFM when rehabilitated. LNS yielded more fat-free tissue and higher recovery rates than CSB. Moreover, current LNS formulation with DS may be improved by shifting to SI. The role of milk relative to soy merits further research.

The overall findings of the TREATFood study support a wider use of LNS in the treatment of children with MAM. A switch to LNS would lead to greater gain of fat-free tissue and recovery and would benefit millions of children.

Another study by the same group found a high degree of morbidity in this population, with nearly 90 per cent of children manifesting clinical signs of illness and/or elevated biomarkers of inflammation (i.e. C-reactive protein and α-glycoprotein) (Cichon et al, 2016).

An additional two analyses from the same study found that children less than 67cm in length with MAM by MUAC only (i.e. MUAC ≥115 mm and < 125 mm but WHZ ≥-2) had similar ponderal growth rates (Fabiansen, 2016) and did not gain excessive fat during supplementation when compared to children ≥67 cm in length with MAM by MUAC only (paper in submission). Currently, protocols for management of acute malnutrition in many African countries (including Cameroon, Central African Republic, Chad, Guinea, Ivory Coast, Mali, Mauritania, Senegal and Togo) instruct health personnel to measure MUAC only of children aged 6-59 months with length ≥67 cm when assessing eligibility for MAM or severe acute malnutrition (SAM) treatment programmes. In Ethiopia, admission by MUAC alone for SAM treatment is restricted to children with lengths >65 cm. These analyses provide strong evidence that the use of length as a criterion for measuring MUAC of children aged 6-59 months should be discontinued in policy and practice.

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[1] Presentation at the ACF Research for Nutrition Conference, Pavillon de L'Eau, 13th November, 2017.

[2] Fabiansen C, Yaméogo CW, Iuel-Brockdorf A-S, et al. *Effectiveness of food supplements in increasing fat-free tissue accretion in children with moderate acute malnutrition: A randomised 2 × 2 × 3 factorial trial in Burkina Faso*. Tumwine JK, ed. *PLoS Medicine*. 2017;14(9):e1002387.doi:10.1371/journal.pmed.1002387.

[3] 17 children were supplemented with Plumpy'Sup due to unconfirmed suspicion of salmonella contamination of their experimental supplement, while 102 children deteriorating into severe acute malnutrition (SAM) were switched to therapeutic foods.

References

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