ABSTRACT
Objectives: Adding iron-rich foods or multi-micronutrients powder (MNP) could be options to control iron deficiency anaemia (IDA) in children. Data evaluating the impact of fortification with iron-rich foods such as amaranth grain and MNP containing low doses of highly bioavailable iron to control IDA is limited. We assessed the efficacy of maize porridge enriched with amaranth grain or MNP to reduce IDA in Kenyan pre-school children.

Methods: In a 16-week intervention trial, children (n=279; 12-59 months) were randomly assigned to: unrefined maize porridge (control; 4.1 mg of iron/meal); unrefined maize (30%) and amaranth grain (70%) porridge (amaranth group; 23 mg of iron/meal); or unrefined maize porridge with MNP (MNP group; 6.6 mg iron/meal; 2.5 mg iron as NaFeEDTA). Primary outcomes were anaemia and iron status with treatment effects estimated relative to control.

Results: At baseline, 38% were anaemic and 30% iron deficient. Consumption of MNP reduced prevalence of anaemia [-46% (95% CI= -67,-12)], ID [-70% (95% CI= -89,-16)], IDA [-75% (95% CI= -92,-20)] and soluble transferrin receptor [-10% (95% CI= -16,-4)] concentration while significantly increasing haemoglobin [2.7 g/L (95% CI= 0.4, 5.1)] and plasma ferritin [40% (95% CI=10, 95)] concentration. There was no significant change in haemoglobin or iron status in the amaranth group.

Conclusions: Consumption of maize porridge fortified with low dose highly bio-available iron MNP can reduce the prevalence of IDA in pre-school children. In contrast, fortification with amaranth grain even when shown to have high iron concentration without reduction of phytic acid may not show significant improvement in iron status.