

The effect of a preconception and antenatal nutritional supplement on children's BMI and weight gain over the first 2 years of life: findings from the NiPPeR randomised controlled trial



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Abstract

Background Nutritional intervention before and throughout pregnancy might promote healthy infant weight gain; however, clinical evidence is scarce. Therefore, we examined whether preconception and antenatal supplementation would affect the body size and growth of children in the first 2 years of life.

Methods Women were recruited from the community before conception in the UK, Singapore, and New Zealand, and randomly allocated to either the intervention (myo-inositol, probiotics, and additional micronutrients) or control group (standard micronutrient supplement) with stratification by site and ethnicity. Measurements of weight and length were obtained from 576 children at multiple timepoints in the first 2 years of life. Differences in age and sex standardised BMI at age 2 years (WHO standards) and the change in weight from birth were examined. Written informed consent was obtained from the mothers, and ethics approval was granted by local committees. The NiPPeR trial was registered with ClinicalTrials.gov (NCT02509988) on July 16, 2015 (Universal Trial Number U1111-1171-8056).

Findings 1729 women were recruited between Aug 3, 2015, and May 31, 2017. Of the women randomised, 586 had births at 24 weeks or more of gestation between April, 2016, and January, 2019. At age 2 years, adjusting for study site, infant sex, parity, maternal smoking, maternal prepregnancy BMI, and gestational age, fewer children of mothers who received the intervention had a BMI of more than the 95th percentile (22 [9%] of 239 vs 44 [18%] of 245, adjusted risk ratio 0.51, 95% CI 0.31–0.82, $p=0.006$). Longitudinal data revealed that the children of mothers who received the intervention had a 24% reduced risk of experiencing rapid weight gain of more than 0.67 SD in the first year of life (58 [21.9%] of 265 vs 80 [31.1%] of 257, adjusted risk ratio 0.76, 95% CI 0.58–1.00, $p=0.047$). Risk was likewise decreased for sustained weight gain of more than 1.34 SD in the first 2 years (19 [7.7%] of 246 vs 43 [17.1%] of 251, adjusted risk ratio 0.55, 95% CI 0.34–0.88, $p=0.014$).

Interpretation Rapid weight gain in infancy is associated with future adverse metabolic health. The intervention supplement taken before and throughout pregnancy was associated with lower risk of rapid weight gain and high BMI at age 2 years among children. Long-term follow-up is required to assess the longevity of these benefits.

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Contributors

KMG, S-YC, and WSC led the NiPPeR trial conception and design, and supervised data collection and assimilation at each of the study sites. JL-R and JGBD did the statistical analysis. JL-R and WSC wrote the Abstract with input from all other authors. All authors have seen and approved the final version of the Abstract for publication.

Declaration of interests

CRM and JMRN are employees of Société des Produits Nestlé. KMG, S-YC, and WSC are part of an academic consortium that has received grants from Société Des Produits Nestlé. All other authors declare no competing interest.

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