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**Background:** Epidemiological evidence suggests that timing of introduction of formula-feeding or solid foods may be associated with subsequent overweight or obesity, and the association may vary by any breastfeeding at first year for four months or more versus not.

**Methods:** We included 346 infants from South Western Sydney using the Longitudinal Study of Australian Children (LSAC) who at baseline examination were singleton births, neither overweight nor obese (weight for age percentile), and were full term births (gestational age > 39 weeks). The primary outcome was time to the occurrence of first overweight or obesity at ages 2, 4, 6, 8 and 10 of the child. Risk of overweight or obesity was defined as body mass index (BMI) ≥ 25, using the National Centre for Health Statistics curves. The primary exposure variable of interest was age at introduction to formula or solid foods (< 4, and ≥ 4 months). Missing data were estimated using multivariate normal imputation (MVNI) based on 25 imputations. We used Cox proportional hazards regression to assess the temporal association between age at introduction to formula or solids and the timing of occurrence of incident overweight or obesity at ages 2, 4, 6, 8 and 10 of the child and tested whether the association between age at introduction to formula or solids and timing of occurrence of incident overweight or obesity was modified by any breastfeeding at first year (≥ 4 months versus not); with and without adjusting for mother's BMI, age, education during pregnancy, race and social disadvantage (SEIFA).

**Results:** The risk of overweight or obesity was significantly higher among infants introduced to formula or solids at < 4 months compared to those introduced at ≥ 4 months in both unadjusted and adjusted analyses. We found strong interaction between age at formula or solids introduction and breastfeeding for four or more months and subsequent risk of incident overweight or obesity. The risk of overweight or obesity by age at formula or solids introduction decreased with increase in any breastfeeding duration to four or more months.

**Conclusions:** Timing of introduction to formula or solids within four months was a risk factor of incident childhood overweight or obesity for children 10 years later; so increasing the prevalence of exclusive breast-feeding to more than four months would be a worthwhile public health measure. Increasing any breastfeeding duration to at least four months would help to further decrease the risk of childhood overweight or obesity.

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