feeding of -0.39 for a fully controlled study (that is, a slight disadvantage).

We analysed the results from the only other study to have used sibling comparisons¹³ separately and with the corresponding results from this study. The estimated standardised difference in means was 0.025 ($SE = 0.041$, $P = 0.540$) for breastfeeding status and 0.040 (0.036 , $P = 0.271$) for duration of breast feeding. Thus, the evidence from the only two sibling pair studies to date, when taken together, offer no support for an advantage of breast feeding.

Discussion

Most of the observed association between breast feeding and cognitive development is the result of confounding by maternal intelligence. Level of cognitive stimulation at home, mother's educational attainment and age at the birth of the child, child's birth order, and family financial hardship all have independent effects. In fully adjusted analyses, the advantage of breast feeding was small and not significant.

Only a small proportion of the many studies that have shown a positive effect of breast feeding on children's cognitive ability control for maternal intelligence. By omitting this from the fully adjusted models, while leaving in maternal education and the other confounders, we have shown that maternal education is an imperfect surrogate. Our study was about five times the size of the largest previous study.¹⁴ Heterogeneity between studies can be accounted for by the number of additional controls. The results lend little support to the hypothesis that breast feeding promotes intelligence in full term infants. The results from the sibling comparisons in our study and the two studies combined provide no support for a beneficial effect of breast feeding.

Wider application of results

This study and the others included in the meta-analysis are all based on samples from developed countries. Generalisation of the findings beyond these and similar societies would be unwise. We have also excluded premature and low birthweight infants for whom the effect may be different.

Evidence showing the many benefits of breast feeding for the child and mother led the World Health Organization and UNICEF to formulate the Innocent Declaration, which includes exclusive breast feeding for 4-6 months as a global goal. Even if it does not enhance intelligence, breast feeding remains "an unequalled way of providing ideal food for the healthy growth and development of infants."¹⁵

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What is known already on this topic

Breast feeding has many benefits for both child and mother

Breastfed children tend to score higher on intelligence tests

There are important differences between mothers who breast feed and those who do not

What this study adds

The apparent effect of breast feeding on intelligence in offspring is accounted for by characteristics of the mother and the home environment

The mother's own intelligence plays the largest part in this explanation

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Endpiece

Cure the disease, kill the patient

As if you would call a physician, that is thought good for the cure of the disease you complain of but is unacquainted with your body, and therefore may put you in the way for a present cure but overthrow your health in some other kind; and so cure the disease and kill the patient.

Francis Bacon (1561-1626)

Submitted by Ruth Green, senior house officer in anaesthetics, Royal Albert Edward Infirmary, Wigan

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