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Breast feeding and obesity in childhood: cross sectional study

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The evidence that breast feeding protects against obesity is inconclusive: some studies show a protective effect[1] and others find no effect.[2 3] Confounding factors may account for these inconsistencies. We used data from the offspring of the 1958 British birth cohort to assess whether breast feeding influences body mass index and obesity in childhood.

Methods and results

We used data from a randomly selected sample (n = 2584) of the members of the 1958 British birth cohort who had children by 1991.[4] Information was collected on their offspring. Of 3077 children aged 4-18 years, we included 2631 children (1293 girls and 1338 boys from 1768 families; average age 8 years) for whom data on duration of breast feeding, body mass index, and confounding factors were available.

Body mass index (weight (kg)/(height (m)^2)) was standardised relative to the 1990 British growth reference,[5] and obesity was defined as a standard deviation score >1.64 (95th centile). Duration of breast feeding had been reported by the mother in 1991 (see table for categories).

Potential confounding factors, reported in 1991, were birth weight; mother's smoking during pregnancy (<1 cigarette/day, 1-9/day, or ≥ 10/day); and social class, based on the 1991 occupation of the male head of household, classified as professional or managerial, skilled non-manual, skilled manual, or semiskilled or non-skilled. Parent's body mass index was derived from height and weight and standardised within the study by sex. The body mass index of the parent (only one parent was the cohort member) was available for each child.

The multilevel models that we used to estimate the relation between body mass index and duration of breast feeding (linear model) and between obesity and duration of breast feeding (logistic model) took into account the correlation between siblings. We used the iterative generalised least squares procedure (MLwiN statistical package) to calculate outcomes for ages 4-8 and 9-18 separately. We calculated odds ratios before and after adjusting for sex, parent's body mass index, maternal smoking during pregnancy, birth weight, and social class.

In our sample, 62.9% of children (1655) had been breast fed for ≥ 1 week. The mean score for body mass index in all children was higher than the growth reference sample by 0.18. A total of 207 children (7.9%) were obese. Mean body mass index and obesity were consistently lower in those breast fed for 2-3 months, though not significantly (table). We found no evidence that breast feeding influenced body mass index or obesity and no dose dependent trend in either age group; adjustment for confounding factors did not alter these findings. That there was no difference in the

Relation of duration of breast feeding to mean body mass index (BMI) and odds ratio for obesity* in children aged 4-18 years in 1991

Duration of breastfeeding	No	Mean SD score for BMI (95% CI)	Odds ratio (95% CI)	
			Adjusted for sex	Adjusted for confounders†
Children aged 4-8:	1541			
<1 week	505	0.21 (0.11 to 0.31)	1.00	1.00
1 week to 1 month	215	0.27 (0.10 to 0.44)	1.19 (0.68 to 2.09)	1.04 (0.57 to 1.90)
2-3 months	220	0.12 (–0.02 to 0.26)	0.64 (0.33 to 1.25)	0.68 (0.34 to 1.35)
4-6 months	210	0.22 (0.07 to 0.37)	0.91 (0.49 to 1.68)	0.94 (0.50 to 1.78)
7-9 months	197	0.24 (0.09 to 0.39)	1.05 (0.58 to 1.92)	1.14 (0.61 to 2.16)
>9 months	194	0.19 (0.06 to 0.32)	0.54 (0.26 to 1.15)	0.61 (0.28 to 1.32)
Children aged 9-18:	1090			
<1 week	471	0.18 (0.08 to 0.28)	1.00	1.00
1 week to 1 month	187	0.05 (–0.09 to 0.19)	1.16 (0.62 to 2.18)	1.25 (0.65 to 2.39)
2-3 months	171	0.04 (–0.12 to 0.20)	0.70 (0.33 to 1.49)	0.69 (0.32 to 1.52)
4-6 months	133	0.24 (0.06 to 0.42)	1.27 (0.63 to 2.55)	1.31 (0.62 to 2.74)
7-9 months	61	0.16 (–0.12 to 0.42)	1.68 (0.70 to 4.05)	2.02 (0.80 to 5.10)
>9 months	67	0.20 (–0.04 to 0.44)	0.73 (0.24 to 2.19)	0.73 (0.23 to 2.27)

*Standard deviation score for body mass index >1.64.
†Adjusted for sex, parent's BMI, maternal smoking during pregnancy, birth weight, and social class.

relation between the age groups suggests that recall bias was not an important factor.

Comment

As in the 1958 birth cohort,[3] results from their offspring provide no support for a protective effect of breast feeding on obesity. In studies reporting a protective effect, it is weak and not always supported by a dose-response relation, which might be expected, at least up to a threshold duration. Any effect of breast feeding may be limited to a critical period or depend on other cofactors. Secular trends do not suggest a protective effect: in both Britain and the United States the incidence of breast feeding has increased since 1990, but so has obesity. Promoting breast feeding is important, but evidence for an important beneficial effect on obesity is still equivocal.

Data were obtained from Centre for Longitudinal Studies, Institute of Education; National Child Development Study Composite File including selected perinatal data and sweeps one to five [computer file]; National Birthday Trust Fund, National Children's Bureau, City University Social Statistics Research Unit [original data producers]; The Data Archive [distributor], Colchester, Essex: SN:3148. 1994.

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Retraction

Hawthorne G, Irgens LM, Lie RT. Outcome of pregnancy in diabetic women in northeast England and in Norway, 1994-7. BMJ 2000;321:730-1.
The *BMJ* is retracting this study at the request of the authors because they have realised that a fundamental mistake was made in collecting the data. The authors give a full account on p 929, but the conclusions cannot be allowed to stand. An editorial by Richard Smith discusses retraction (p 883).

Drug points

Weight loss associated with levetiracetam

S Hadjikoutis, T P Pickersgill, P E M Smith

Levetiracetam is a relatively new anti-epileptic drug licensed for refractory partial epilepsy, although it may have a broad range of action. Levetiracetam's mode of action is unknown.[1] Common adverse effects reported relate to the central nervous system, but recognised gastrointestinal side effects include diarrhoea and anorexia.[2] We report four cases of considerable weight loss associated with using levetiracetam (table).

No change in anti-epileptic treatment was made during the period of treatment of the four patients, and we identified no other cause of weight loss. The patients lost 2.3-7.0 kg a month, and starting levetiracetam coincided with the start of the period of weight loss. One patient stopped the treatment, and her weight increased. The other three patients decided to continue treatment because levetiracetam had improved their control of seizures. Their weight stabilised or increased after reducing the dose of levetiracetam by 250-500 mg.

The mechanism of the weight loss is unclear. None of the patients reported decreased appetite during the period of weight loss; however, one patient developed pica and craved only toast, cereal, scallops, and caviar. All cases were reported to the Committee on Safety of Medicines and the manufacturers.

We have not found any other reported cases of weight loss associated with levetiracetam. We have about 300 patients who have been prescribed levetiracetam on our epilepsy unit database. These four cases therefore represent about 1% of patients on the drug, which, for a serious adverse effect, might reasonably be regarded as common. Anti-epileptic drugs known to cause considerable weight loss include topiramate and zonisamide.[3 4] Levetiracetam is also a potential cause of weight loss.

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Weight loss in patients taking levetiracetam

Patient	Sex	Age (years)	Type of focal epilepsy	Daily dose of levetiracetam (mg)	Duration of treatment (months)	Weight loss (kg)	Other anti-epileptic treatment
1	Male	20	Symptomatic	2000	6	20	Carbamazepine
2	Female	49	Symptomatic	2000	5	35	Sodium valproate
3	Female	30	Symptomatic	3000	6	25	Lamotrigine, clonazepam
4	Female	22	Cryptogenic	3000	12	27	Lamotrigine, topiramate