

Early infant feeding and weight gain

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SUMMARY. Three hundred and one babies were surveyed for one year in an infant welfare clinic in North London. There was no significant difference at six months and one year of age in the mean weights of babies breast-fed for more than one month and those not breast-fed at all.

At six months, the mean weight of those babies given solid food before three months of age was significantly higher than the mean weight of those babies given solids only after three months of age. This difference had disappeared by one year of age.

Introduction

IT has been suggested that obesity in children may be influenced by early feeding habits. The early introduction of solid food into the infant's diet and the use of artificial as opposed to breast milk are two factors which may predispose to infantile obesity (Taitz, 1971; Shukla *et al.*, 1972).

I investigated the feeding patterns and weight gains in infants routinely attending a health authority clinic, to establish whether breast feeding as practised in the community is associated with less infantile obesity.

Method

Three hundred and one babies under one year of age were examined by me on their routine visits to Highbury Grange Infant Welfare Clinic in North London during the year from September 1974 to September 1975. Babies with major congenital defects and those with birthweights below 2 kg were excluded. All infants were seen on at least two occasions, four or more months apart.

The following details were recorded: date of birth, sex, birthweight, duration of breast feeding, and time of introduction of solid feeds (including rusks in the bottle). The babies were weighed nude at each visit and examined by me. There was some variation in the ages at which weights of the babies were obtained. To allow

comparisons of the mean weights of groups of infants at the ages of six weeks, six months, and one year, weights measured within one week of six weeks of age or within one month of six and 12 months of age were corrected along weight-growth curves (Tanner *et al.*, 1966).

Results

One hundred and forty-seven male and 154 female infants were studied.

Breast feeding

One hundred and twenty-nine mothers (43 per cent) initiated breast feeding, but only 84 (28 per cent) continued to breast feed for one month; 27 (nine per cent) continued for over five months.

Weight gain

There was no significant difference in the mean weights of those infants who were breast-fed for more than one month compared with those who were not, at birth, six weeks, six months, or one year of age (Table 1).

Solid feeds

Fifty per cent of these babies were given their first solid food by two months of age. The earliest age of introduction of solids was three days.

In the group who were not given solids until three months of age, 37 out of 82 infants (45 per cent) were breast-fed for more than one month. In the group introduced to solid foods between six weeks and three months of age, 31 out of 134 (23 per cent) were breast-fed. In the group given solid food before six weeks of age, five out of 56 (8.9 per cent) of babies were breast-fed. The difference between the numbers of babies breast-fed for more than one month in the groups introduced to solid feeding before six weeks and after three months of age is highly significant ($\chi^2 = 20.59$, $p < 0.001$).

Infants who were started on solids before six weeks of age had a significantly higher mean weight at the age of six months than those in whom solids were not started until three months of age ($p < 0.01$). There was no significant difference when the weights of these groups

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Table 1. Mean weights in kilograms of infants not breast-fed and of those breast-fed for more than one month.

	Number in group	Birth	Six weeks	Six months	One year
Boys not breast-fed	92	3.34 ± 0.54	4.83 ± 0.72	8.36 ± 1.20	10.50 ± 1.36
Girls not breast-fed	80	3.20 ± 0.43	4.60 ± 0.63	7.83 ± 0.83	9.96 ± 1.13
Boys breast-fed > 1 month	36	3.35 ± 0.33	4.75 ± 0.97	8.16 ± 0.95	10.29 ± 1.56
Girls breast-fed > 1 month	48	3.37 ± 0.55	4.62 ± 0.69	7.76 ± 0.92	9.93 ± 1.24

Table 2. Mean weights in kilograms related to time of introduction of solid food.

Age at which solids first given	Number in group	Birth	Six weeks	Six months	One year
Boys over 3 months	34	3.17 ± 0.46	4.66 ± 0.53	8.04 ± 0.93	10.24 ± 1.04
Girls over 3 months	48	3.17 ± 0.46	4.47 ± 0.62	7.49 ± 0.85	9.56 ± 1.08
Boys 6 weeks-3 months	72	3.35 ± 0.48	4.98 ± 0.74	8.40 ± 1.05	10.40 ± 1.20
Girls 6 weeks-3 months	62	3.32 ± 0.47	4.76 ± 0.63	8.00 ± 0.90	10.07 ± 1.19
Boys before 6 weeks	27	3.40 ± 0.48	4.86 ± 0.59	8.63 ± 1.26	10.85 ± 1.61
Girls before 6 weeks	29	3.25 ± 0.43	4.54 ± 0.47	7.79 ± 0.83	10.09 ± 1.14

were compared at the age of one year (Table 2).

Amongst each group of infants subdivided by the time of initiation of solid feeding, there was no significant difference in the mean weights of the artificially-fed babies compared with those of the babies breast-fed for more than one month.

Discussion

This survey confirms the observed trend towards artificial feeding in the British Isles (DHSS, 1974).

In two recent surveys it was shown that excess caloric intake in artificial feeding causes excessive weight gain (Taitz, 1971; Shukla *et al.*, 1972). In both these surveys the incidence of breast feeding for more than one month was low (14 per cent and eight per cent respectively). It thus remains uncertain from these studies whether breast feeding as it is practised in the community protects against obesity.

In this study there was no significant difference between the mean weights of breast-fed and bottle-fed babies.

At six months of age there was a significant difference between the weights of infants who had been given solid food very early in life and the weights of infants who had received their first solids after three months of age. However, this difference was no longer significant when these groups were compared at one year of age.

Solid feeding tended to be introduced later in the breast-fed group, but if the babies who started solid feeding at the same time were compared, breast-fed babies were no lighter than their bottle-fed counter-

parts. It would thus appear that it is more important to advise against early solid feeding than to encourage breast feeding in attempting to avoid infantile obesity. The advantages of breast feeding, however, can be advocated on other grounds.

References

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Communicable diseases

The occurrence of nine cases of diphtheria, one of them fatal, emphasized the continuing need to protect children against this disease. It is important that the public should be aware that diphtheria can still be lethal to a child who has not been immunized against it. Basic immunization with combined diphtheria and tetanus vaccine has, to some extent, replaced the use of diphtheria, tetanus, and pertussis (triple) vaccine, as a result of adverse publicity concerning the pertussis (whooping cough) component. This publicity led to a substantial decline during 1975 in the use not only of whooping cough vaccine but, to a lesser degree, of other vaccines as well.

Reference

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