Occasional Review

When and why are babies weaned?

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Summary and conclusions

A prospective study was designed to investigate the weaning practices of 50 primiparous mothers whose babies were born between September 1976 and March 1978. The question whether the age of weaning influenced growth from birth to 6 months was also considered. The mothers and babies were seen in hospital and then at a follow-up clinic at 1, 2, 3, and 6 months. Details were taken of feeding practices, and measurements made of the babies' weight, length, and subscapular and triceps skinfold thicknesses. Seventeen infants who were breast-fed received their first solid food at a mean age of 13.8 weeks, compared with 8.3 weeks for the 33 bottle-fed infants. Most (38) mothers weaned because they thought their babies were hungry (crying after a feed or demanding more frequent feeds, or both). The age of weaning did not influence weight gain, growth in length, or change in skinfold thicknesses.

The results suggest that the "4-month rule" for weaning is unrealistic. The decision to wean should be based more on the mother's interpretation of her baby's needs than on age alone.

Introduction

Over the past 50 years infants have been started on solid foods at an increasingly early age. The 1974 report *Present-Day Practice in Infant Feeding* drew attention to the fact that 80-95% of British infants were already weaned (started on non-milk foods) by 3 months of age.¹ In the early 1970s concern was expressed that this practice contributed to the development of hyperosmolar states² and excessive weight gain.³ As a result widespread efforts were made to discourage mothers from introducing solids too early, and these were endorsed in the DHSS report,¹ which recommended that "the early introduction of cereals or other solid foods to the diet of babies before about 4 months of age should be strongly discouraged."

We have noticed that many mothers have continued to wean before 4 months. We therefore decided to make a detailed prospective study of current weaning practices, particularly asking when and why mothers are choosing to wean. We also determined whether the age of weaning influences growth from birth to 6 months of age.

Subjects and methods

Fifty-six term, white infants of appropriate weight for gestation were studied prospectively. Fifty infants completed the study; four infants were excluded because of inadequate follow-up and two because of feeding problems that needed medical intervention. The infants were born to primiparous mothers (to minimise the extent to which experience might influence feeding patterns) in Leicester Maternity Hospital between September 1976 and March 1977 and nursed on two of its wards. The distribution of the mothers according to social class was: I and II—17; III—23; IV and V—10. To facilitate arrangements for follow-up only mothers living in the City of Leicester were studied. When in hospital they were seen by one of us (PW), and to avoid introducing bias by drawing the mothers' attention to the subject of weaning the project was explained as a study of the early growth of healthy infants. During the initial interview the mothers were casually asked whether they had any fixed idea about when they would start their infants on solids. Weaning was not mentioned again until the mothers volunteered this information at follow-up.

In hospital the infants' birth weights were recorded and their length measured with a neonatometer,⁴ and subscapular and triceps skinfold thicknesses were measured with Harpenden skinfold calipers. The mothers were asked to bring the babies to a follow-up clinic in the hospital at 1, 2, 3, and 6 months of age. If they could not attend they

Individual ages of weaning in the three infant groups.

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were visited at home (PW). At each clinic visit details were taken of how the babies were being fed, including an estimate of the amount of milk being taken at each feed for bottle-fed infants. No questions were asked about the introduction of solids until the mother volunteered this information when describing the baby's diet. The age and reasons for weaning and the type of solids given were recorded. At the 6-months visit the babies' weight, length, and skinfold thicknesses were measured, and from these data growth rates from birth to 6 months were calculated. Only infants measured at 6 months (± 2 weeks) were included in the growth analysis.

Results

Feeding groups—The infants were grouped according to their feeding at weaning: 17 were breast-fed; 24 were bottle-fed; and nine were a mixed group who were initially breast-fed, but were changed to bottle-feeding before 6 weeks.

Intended age of weaning—When the mothers were approached in hospital 35 (70%) had no fixed idea about the age of weaning and 15 (30%) actually specified ages, which ranged from 3 to 6 months.

Actual age of weaning—The figure shows the age of weaning in each infant. The breast-fed babies received their first solid food at a mean age of 13.8 weeks compared with 7.8 weeks in the bottle-fed babies and 9.6 weeks in the mixed group. In 43 babies (86%) the first solid food was a cereal. The second type of solid was introduced at mean ages of 16.6, 11.8, and 11.2 weeks respectively.

Why do mothers wean? Most mothers started to wean their babies because they thought that they were hungry: the infant cried after a feed or demanded a feed earlier than usual, or both (table I). Fewer, but still most, of the mothers who breast-fed gave hunger as the main reason. Apparently the babies were indeed hungry, since they became more content when solids were started. Interestingly, only a little solid food was needed to relieve hunger, usually about one to two teaspoonfuls.

Whose idea to wean? Fifteen of the mothers (30%) mentioned that the decision to wean was entirely their own. A further 15 (30%) sought and accepted the advice which was given to them by health visitors. Twenty (40%) received advice from other sources (grandmother, friends, books, general practitioner, husband).

TABLE I—Reasons given by mothers for starting to wean their infants, according to infant-feeding groups

Reasons for weaning	No ("n") of infants
Bottle-fed (n = 24)	
Hunger	20 (83)
Other:	4 (17)
Vomiting. Clinic advised solids	1 (4)
Refused 10 pm feed. Solids tried	1 (4)
To try to make infant sleep through the night	1 (4)
Mother thought she would try solids	1 (4)
Breast-fed (n = 17)	
Hunger	10 (59)
Other:	7 (41)
Advice from books to start weaning to avoid difficulties later	2 (12)
Pressure from friends	1 (6)
Weight not increasing as expected	1 (6)
Mother thought baby was not getting enough milk because of poor weight gain	1 (6)
Baby 4 months old	1 (6)
Mother decided to try baby with solids	1 (6)
Mixed (n = 9)	
Hunger	8 (89)
Other:	1 (11)
Baby not keen on bottle. Health clinic recommended solids	1 (11)

TABLE II—Influence of age of weaning on weight gain, growth in length, and increase in combined skinfold thicknesses from birth to 6 months. Values are means $\pm$ SD. Numbers of infants in parentheses*

Yearly growth rates	Age of weaning		Significance of difference
	≤ 10 weeks	> 10 weeks	
Weight (kg)	8.6 $\pm$ 1.4 (26)	8.5 $\pm$ 1.3 (19)	$t = 0.25$; NS
Length (cm)	33.1 $\pm$ 3.0 (26)	31.7 $\pm$ 4.8 (17)	$t = 1.07$; NS
Combined subscapular and triceps skinfold thickness (mm)	9.1 $\pm$ 5.5 (23)	8.3 $\pm$ 3.5 (19)	$t = 0.58$; NS

NS = Not significant.

*Only infants measured at 6 months (± 2 weeks) were included in growth analysis.

Amount of milk taken by bottle-fed infants at weaning—Average quantities of milk taken at each feed were 6–7 oz (170–198 g). Only 10 infants were taking a full 8 oz (227 g) feed immediately before weaning, while 23 were taking less than 3 oz. All the infants were being fed modified milks.

Growth from birth to 6 months—To see whether the age of weaning influenced growth from birth to 6 months the infants were divided into two groups: those weaned by the end of the 10th week and those weaned later. Table II shows that there were no significant differences in rate of weight gain, growth in length, or increase in combined skinfold thicknesses between the two groups.

Discussion

Our results suggest that most women who are having their first baby enter motherhood with a comparatively open mind about when their babies should be weaned. Breast-fed babies were weaned on average at 14 weeks, which closely follows the 1974 DHSS recommendations, but those in the bottle-fed and mixed groups were weaned much earlier at 8 and 10 weeks respectively. In all groups, however, the most common reason for weaning was hunger.

Why were the bottle-fed infants weaned earlier? Possibly mothers who breast-feed initially respond to signs of hunger in their infants by increasing the frequency of feeds before resorting to solids. We did not, however, confirm this by discussions with these mothers. Alternatively, differences in maternal attitudes might have been responsible: mothers who breast-feed may be more aware than those who bottle-feed of the possible problems of weaning too early. Lastly, many doctors and nurses think that infants who are fed modified milks are often less "satisfied" than those fed unmodified milks: if true, this might have resulted in mothers weaning at an earlier age.

The introduction of mixed feeding continues to pose problems not only to mothers but also to doctors, nurses, and other professional workers who are responsible for advising about infant feeding. Unfortunately, their advice is often inconsistent, which serves only to increase the mothers' worries. Some of the inconsistencies undoubtedly result from a need to satisfy a baby's individual requirements while at the same time trying to follow current recommendations. Our findings suggest, however, that the widely used DHSS recommendations¹ are difficult to implement. The following suggestions may help to resolve the problem of when to begin solids. If a baby seems unsatisfied after a feed or demands more frequent feeds and will not take extra milk if offered, it seems sensible to begin solids. Our results show that symptoms of hunger may be satisfied by such small amounts of solids that hyperosmolarity is unlikely to occur, provided that mixed feeds are given in moderation and in response to infants' needs. Furthermore, our study confirms the results of other recently published investigations,^{5,6} which showed that the early introduction of solid foods does not affect the rate of weight gain in infancy. This may reassure the many doctors and nurses who discourage early weaning because they fear that obesity might result.

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