ORIGINAL ARTICLE

Evaluation of Breast-Feeding Promotion Policy in Cipto Mangunkusumo Hospital Jakarta

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ABSTRACT The purpose of this prospective cohort study was to evaluate the breast-feeding promotion program in Dr. Cipto Mangunkusumo general hospital which we started in 1991. The study was done from July 1992 until March 1993. During that time we could follow 249 mother-infant pairs every month for 4 months. Results: 1. Babies who received only breast milk during hospital stay did not lose more weight if compared to the babies who got some formula. 2. Not a single baby lost weight more than 10% during hospital stay; 3. Prelacteal feeding delayed the adequacy of breast-milk; 4. Though prelacteal feeding once or twice by spoon did not interfere with full breast-feeding at the age of 4 months, yet mothers whose babies were given prelacteal feeding started to give supplementary food earlier; 5. Family income places a role in the decision to give early food supplement. **[Paediatr Indones 1995; 35:84-93]**

Introduction

Breast-feeding is an unequaled way of providing ideal food for the healthy growth and development of infants, and has a unique biological and emotional influence on the health of both mother and child. The anti-infective properties of breast milk protect infants against disease, and there is an important relation of breast-feeding and birth spacing.

Lactation is the physiologic completion of the reproductive cycle. For the mother breast-feeding is not a reflex; rather, it is a learned process. Successful lactation depends on proper information based on sound physiologic principles.[1]

Some hospital rituals have been credited with the interference of a good milk supply. For this reason in the year 1989 WHO and UNICEF prepared a joint statement to increase awareness of the important role the health services in protecting, promoting, and supporting breast-feeding. This is described in what is now known as *The Ten Steps* to successful breast-feeding.[2]

Since Mme Suharto on the 3rd of August 1991 announced *The Baby Friendly Hospital Competition*, many hospitals have started to promote breast-feeding by performing The Ten Steps.

When we started with The Ten Steps at Cipto Mangunkusumo Hospital, we had some difficulties in performing the sixth step *(Give newborn infants no food or drink other than breast-milk, unless medically indicated)* At the time of our study, because the health personnel were afraid of loosing much the baby's weight, many babies were still given prelacteal feeding of baby formula if after more than 24 hours the baby became fretful and the mother's milk had not "come" yet.

The aim of the study was to find out:

1. The characteristics of mothers who chose Cipto Mangunkusumo Hospital to deliver the baby
2. Whether babies not given any prelacteal feeding would lose much weight during the first few days when lactation was not established yet
3. Whether prelacteal feeding influenced the coming of the milk
4. What percentage of babies were still on full breast-feeding at the age of 4 months
5. When and what kind of supplementary food was given to the babies
6. What factors influenced mothers to start early supplementary food for the babies.

Methods

The study was performed from July 1992 until March 1993. Mother-infant pairs were taken from The Rooming-in Ward of Cipto Mangunkusumo Hospital.

Criteria for inclusion

To be included into the study, the mother had to be healthy, was not employed, did not have smoking habit, agreed not to take hormonal contraceptives during the first 4 months, and agreed to give consent. The baby should be normally delivered, full-term, singleton, Apgar score at 5 minute was more than 7, had a good sucking reflex, was cared in a rooming-in nursery, and had no congenital malformation.

Mothers who had inverted nipples, or any behavioral disorders, as well as babies who had separate nursing for more than 3 hours were excluded from the study.

Hospital procedures

- As soon as possible after birth the baby was given to the mother for skin-to-skin contact and stimulation of the breast. Mother was given information on the benefits of breast-feeding and the physiology of lactation.
- Within 2 hours mother and baby were moved to the rooming-in ward and the mother was helped to position her baby and given instructions to breast-feed *on demand.*
- Mothers were examined every day to see whether the breast milk has come in or not.

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- If after 24 hours or more breast milk has not come yet and baby is fretful, some baby formula was given to the baby by spoon. Time and method of giving baby formula was carefully recorded.
- The baby's weight was recorded every day.

Sampling method

Babies who during hospitalization were only breastfed were grouped as Group A while those babies who had at least once milk formula by spoon were grouped as Group B. Samples were taken by stratified random sampling.

Collection of data was done in the first three months. Follow-up were done at the age of 1, 2, 3, and 4 months (± 3 days) at our Lactation Clinic or at home if the mother and baby failed to show up for follow-up.

Follow-up

Mothers were asked to return to the clinic for follow-up every month at baby's age of 1, 2, 3, and 4 months. Every time the mothers came to the clinic for follow-up they were given information on the advantages of exclusive breast-feeding for at least 4 months.

On follow-up, either at the Lactation Clinic or at home, the following information was collected carefully in every study subject:

- Weight and length of the baby
- Whether supplementary food was already given
- If so when and what kind of supplementary food given.

Results

From 280 mother-baby pairs included in the study we could only follow 249 pairs until 4 months. The loss to follow-up was due to change of address or difficulty to find the address.

One hundred twenty five babies were not given anything else but breast milk (Group A) and 124 babies were given once or twice baby formula by spoon (Group B).

Characteristics of the subjects

Mother

a. Maternal education

Table 1 shows that most of the mothers had more than 9 years of formal education, and there was no difference between the distribution of maternal education in both groups.

Table 1. Distribution of mother's education by group

Education (yr)	No	Group A	Group B
< 6	67	31 (46.2%)	36 (53.8%)
6-9	54	29 (53.7%)	25 (46.7%)
> 9	128	65 (50.7%)	63 (49.%)

b. Family income

If we had classified family income according to the Annual World Bank (1991), every subject in this study would have belonged to the low income group. For that reason we classified it according to Musadad.[3]

It appears in Table 2 that more than 98% have a family income of less than Rp. 400,000 (approx. USD 200) a month and we found that there was no difference in the distribution of family income between the two groups.

Table 2. Distribution of family income by group

Family Income Per Month	Total	Group A	Group B
< Rp.100,000	50	25	25
Rp.100,000-	195	97	98
Rp. 400,000-	4	2	2

c. Parity

We only differentiated parity only by first child and more than one child. Table 3 discloses that approximately 50% of mothers had only one child, and the rest had more than one child.

We found no difference in the distribution of number of children between the two groups.

Table 3. Distribution of parity by group

Parity	Total	Group A	Group B
1 child	113	58 (51.4%)	55 (48.6%)
> 1 child	139	67 (49.3%)	69 (50.7%)

d. Age

More than 70% of mothers were less than 30 years of age at the time of the study. There was no difference in the distribution of age between the two groups. See Table 4.

Table 4. Distribution of age by group

Age (years)	No	Group A	Group B
< 30	175	97 (55.4%)	78 (45.6%)
30 or more	74	28 (37.8%)	46 (62.2%)

Baby

a. Sex

Table 5 discloses sex distribution of babies studied in both groups; it is clearly seen that both sexes were equally distributed.

Table 5. Distribution of sex by group

Sex	No	Group A	Group B
Boys	122	62 (49.6%)	60 (48.4%)
Girls	127	63 (50.4%)	64 (51.6%)

b. Birth weight and length

Birth weight and length of all babies were measured using the same scale and measurements throughout the study. There was no difference in the average of birth-weight and birth length between the two groups, as can be seen in Table 6.

Table 6. Average birth weight and length by group

Group	No	Birth weight (g) mean (SD)	Birth length (cm) mean (SD)
A	125	3109.8 (394.6)	48.7 (1.5)
B	124	3079.2 (362.8)	48.9 (1.6)

Findings at discharge

A. Weight on the third day

There were 20 babies, 14 from group A and 6 from group B, who went home before the age of 48 hours. Table 7 describes the average of weight in both groups. It appears that the average of weight in both groups was essentially the same.

Table 7. Average weight at the age of 3 days

Group	No	Weight (gram) mean (SD)
A	111	3000.4 (389.9)
B	118	2970.4 (442.1)

p = 0.587

B. Average time when milk has "come"

By this we meant that if we pressed the mother's areola, the will dripped.

Table 8. The average time for breast milk to "come"

Group	total	Age (hours) mean (SD)
A	123	23.0 (15)
B	120	33.5 (15)

p<0.05

In six mothers the time when milk has 'come' was not recorded. We found that in mothers whose babies did not get prelacteal feed, the milk came in sooner and the difference was statistically significant. See Table 8.

Findings at the age of 4 months

A. Feeding pattern

Table 9 shows that at the age of 4 months 165 (66.2%) babies were having only breast milk. It is also seen that the proportion of mothers who still gave breast-feeding fully was higher in group A than that in group B, but the difference was statistically not significant.

Table 9. Feeding pattern at the age of 4 months

Group	No	BF only	BF + other food
A	125	86 (68.8%)	39 (31.2%)
B	124	79 (63.7%)	45 (36.3%)
Total	249	165 (66.2%)	84 (33.8%)

p>0.05. BF = breast feeding

B. Supplementary food

The kinds of food given to the baby before the age of 4 months were: baby formula, fruits, biscuits, and milk porridge. The main reason for giving food was that the mother thought that the baby was not getting enough breast milk. See Table 10. Here we see that more mothers of group B started to give other food at an earlier age than that of group A. However, we could not analyze this particular aspect as the sample was too small.

C. Infant's physical growth

We compared the weight and length of the babies that were still breast-fed fully with the babies that have any other food at the age of 4 months (Table 11).

Table 10. Kind of other food and time of starting other food in group A and B

Kind of food	Baby formula		Fruits		Biscuits		Milk porridge	
Group	A	B	A	B	A	B	A	B
1 mo	5	9	6	4	0	0	0	1
2 mo	6	11	14	18	0	2	1	4
3 mo	11	13	30	34	2	3	4	5
4 mo	11	13	35	35	2	3	5	9

Table 11. Average weight and average increase of weight at 4 months of BM only versus BM+ other food babies

Group	No	Weight at 4 mo mean (SD)	Increase of weight mean (SD)
BM only	165	6273.3 (612.1)	3192.8 (496.9)
BM+SF	84	6200.5 (557.2)	3078.3 (470.5)

t-tst; p = 0.939
BM=breast milk; SF =supplementary food

Table 12. Average length and average increase in length at 4 months of age of babies on BM only and babies on BM + other food

Group	n	Height (cm) mean (SD)	Increase in height (cm) mean (SD)
BM only	165	61.4 (1.9)	12.4 (2.0)
BM + suppl food	84	61.3 (1.5)	12.2 (1.7)

t-test; p=0.165

Here we see that at 4 months the average weight and the average increase in weight of babies on breast milk only did not differ significantly from babies who were on breast milk plus other food. In both group the growth is normal; we can say that full breast feeding for 4 months did not interfere with the babies growth.

Similarly, there was no significant difference of baby's length at the age of 4 months, and there was no difference of the increase of the body length (see Table 12).

Factors influencing mothers to start giving supplementary food

A. Mother's education

In our study there was no difference on the level of education in deciding to start other food. This is not in accordance with the findings in other studies that showed that mothers with a higher level of education tends to postpone giving supplementary food (Table 13).

Table 13. Level of mother's education

Level of education (yr)	n	BM only	BM + suppl. food
6 or less	76	44 (65,6%)	23 (34,4%)
6-9	54	41 (75,9%)	13 (24,1%)
9 or more	128	80 (62,5%)	48 (37,5%)
Total	249	165	84

x^2-test; p = 0,36

B. Family income

Here we see that out of 50 mothers whose family income was less than Rp. 100 000 per month, only 8 (16%) had started to give supplementary food, while of 199 mothers whose family income

more than Rp. 100 000 per month 76 (38.2%) had started to do so. Mothers with less family income tended to postpone giving supplementary food.

Table 14. Family income of babies on BM only versus babies on BM + supplementary food

Family income (x 1000 Rupiahs)*	n	BM only	BM + suppl. food
≤100	50	42 (84.0%)	8 (16,0%)
100-400	195	120 (61.5%)	75 (38,5%)
≥400	4	3	1
Total	249	165	84

* The rate at the time of the study was approx. 2 000 Rupiahs per US $.

C. Parity

Table 15 shows that the experience of breast feeding an older sibling does not influence mother's decision to start giving supplementary food.

Table 15. Parity of mothers giving only BM versus BM + other food

Parity	number	BM only	BM + other food
First child	113	76 (67,2&)	37 (32,8%)
More than one child	136	89 (65,4%)	47 (34,6%)
Total	249	165	84

x^2-test, p=0.65

D. Maternal age

The age of the mother did not significantly influence the practice of giving breast milk only. Out of 175 mothers less than 30 years of age, 57 (32.5%) and out of 74 mothers more than 30 years of age 27 (36.6%) have given supplementary food before the infant aged 4 months. See Table 16.

Table 16. Distribution of maternal age of BM only and BM+ supplementary food

Age	total	BM only	BM + Suppl food
30 years or less	175	118 (67.4%)	57 (32.6%)
more than 30 years	74	47 (63.5%)	27 (36.5%)
Total	249	165	84

x^2 test; p = 0.50

Discussion

Weight on the third day

Under normal conditions, natural energy and water reserves are sufficient to sustain the newborn for the first few days of life while lactation is being fully established. The loss of weight from 5-10% in the first week is physiological.[1,4]

In our study both group A and B babies lost weight on the third day , but the difference of the loss was not significant statistically. None of the babies has lost weight of more than 10 %.

The administration of milk based formula is not only unnecessary on nutritional grounds but also increases the risk of introducing infection and of sensitizing the baby to cow's-milk protein.[1]

Adequacy of breast milk

It is well established that the more frequent the suckling the more quickly the milk builds up.[5] Supplementation, especially with formula decreases infants stimulus to the breast and may lengthen the time to the next feeding because of delayed emptying time of stomach of the formula. The emptying time of the stomach of human milk is 1.5 to 2 hours while for baby formula is 3 hours. Even supplementing with water has been thought by some to delay the arrival of milk..[6,7]

Our study proved that by giving prelacteal feeding eventhough only once or twice and by spoon has already delayed the coming of the milk.

Feeding pattern at the age of 4 months

Salarya and Easton[8] reported that feeding on demand since birth will shorten the time for milk to come and lengthen the duration of breast-feeding.

In our study it was proven that at the age of 4 months 165 babies were still being fed with only breast-milk; there was no difference between group A and group B babies.

Our hypothesis that at the age of 4 months more babies from group A are fully breast-fed compared to group B was not valid. This could be because demand feeding were practiced and counseling were given in both groups. Also formula feeding in our study were only given for once or twice, and it was given by spoon, so that it did not change the sucking reflexes.

Supplementary food

Fruits are the most frequent supplementary food given. This is in accordance with the study done by Atmajaya[9] that reported that 61.3% of mothers have given fruits to their babies at the average age of 2.2 months. In our study fruits were given at the average age of 3 months and the frequency was only 33.8%. Fretful baby and concerned mother that her milk was not sufficient were the reasons given why mothers started to give supplementary foods. This is in accordance with the findings of Gussler and Briesemeister.[10]

Supplementary feeding given too early has many disadvantages. It will decrease the babies willingness to suck from the mother's breast with the consequence of significantly decrease milk production.[11] Also, supplementary food with high protein and minerals makes a burden to the immature kidney of the baby.[12,13]

Weight and length at 4 months

Normal increase in weight is about 750 grams a month for the first three months.[14] According to Waterlow and Thomson[15] breastmilk alone can fulfil the energy the baby needs until at least 4 months.

Our study showed that babies who were fully breast-fed and babies who were breast-fed plus received supplementary feeding gained weight adequately. There was no difference between the two groups. This result proved that fully breast-fed babies grow as well, if not better, than babies with supplementary feeding.

Level of education

Hofvander and Barvazian[16] reported that educated mothers tend to postpone giving supplementary food, while on the contrary findings from the Indonesian Household Health Survey as reported by Musadad[3] was that the more educated mothers tend to give supplementary food earlier.

Our study showed that mothers with 9 or more years of education did not differ from mothers with less than 9 years of education in giving supplementary food.

Family income

Family income if classified according to Musadad[3] the Mothers with low family income that is less than Rp. 100,000 a month (according to classification by Musadad[3]) tend to postpone giving supplementary foods. This is in accordance with the findings from the Indonesian Household Health Survey.[3] According to Ekwo[17] the success of breast-feeding does not depend on the family income but more on the motivation and confidence of the mother to breast feed.

Parity

In our study no difference was found between mothers that had ever breast feed and primiparous mothers.

Age of the mother

In developed countries the prevalence and duration of breast feeding increases in mothers over 25 years of age.[16,18,19] Findings from The Demographic Health Survey as analyzed by the Center Bureau of Statistics[20] showed that more mothers over 30 years tend to start supplementary foods earlier than 3 months if compared to mothers less than 30 years of age.

Our present study did not find any difference between mothers 30 years or more and mothers under 30 years for their decision to postpone supplementary foods.

CONCLUSIONS

Several conclusions can be drawn from our present study:

- On the third day the weight loss of babies without prelacteal feeding did not differ from those with prelacteal feeding. None of the babies lost more than 10% of weight.
- The arrival of milk is significantly earlier in mothers whose babies were not given prelacteal feeding.
- Prelacteal feeding given by spoon once or twice during hospitalization seemed not to interfere with fully breast feeding at the age of 4 months, but the introduction of supplementary feeding was sooner in babies who were given prelacteal feeding.
- At the age of 4 months growth of fully breast-fed babies did not differ from growth of babies with supplementary feeding. Fruit was the most frequent kind of supplementary feed given
- Family income had an influence on the introduction of supplementary feeding before the age of 4 months, while education, parity, and age of mother had not.

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