

BREASTFEEDING AND WEANING PRACTICES IN RELATION TO NUTRITIONAL STATUS OF INFANTS

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ABSTRACT

During the critical period of infancy, breastfeeding and weaning practices play an important role in determining the growth of an infant. The present study investigates the issue by observing 225 infants from Low Socio Economic (LSE) class (n=150) and High Socio Economic (HSE) class (n=75) for weight, height, and feeding practices. Almost all artificially fed (AF) infants in LSE class were malnourished while this was not so in the HSE class. However, the proportion of malnourished children in the LSE class for partially breastfed (BF+AF) group was comparable with exclusively breastfed (BF) group and was significantly lower ($p < 0.01$) than AF group indicating protective effect of partial breastfeeding against risks of contamination associated with weaning foods in such communities. The real bottleneck thus appears to be the lack of knowledge of handling and giving weaning foods in adequate quantities. Educating mothers appears to be the meaningful solution for improving the nutritional status of infants in poor communities.

Key words: Weaning, Breastfeeding, Artificial feeding, Malnutrition, Growth.

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Superiority of the breast milk as best food for infants is well documented(1,2). At the same time, it cannot be denied that exclusive breastfeeding later on in the first year of life cannot meet the demands for optimal growth. The estimate of optimum duration for which breastfeeding is desirable varies from 3 to 6 months(3). The epidemiological studies in India(4,5) show that in poor low socio-economic communities, exclusive breastfeeding well beyond 6 months is customary. Since the lactational performance of poorly nourished mothers from such communities is likely to be poor, longer durations of breastfeeding have direct implications for infant growth. Further, late weaning in such communities is often inadequate in quality and quantity which also affects infant growth. Clearly, breastfeeding and weaning practices are of considerable importance in the context of childhood malnutrition, which is a major problem in developing countries like India.

Reports examining data on growth in relation to exclusive breastfeeding show differing results. For example, Ahn *et al.*(6) observed satisfactory growth without supplementation during major part of the first year of life, while Sidhy *et al.*(7) and Kumari *et al.*(8) reported adequate growth only for 7 and 3 months respectively among Indian communities. Clearly the adequacy of rebreastfeeding needs to be examined in the socio-economic context of the community. Social class related differences are even more prominent with regard to weaning practices. It is known that lower the socio-economic status, later is the age of initiation of weaning food. Further, inappropriate weaning practices in poor communities due to several constraints such as lack of purchasing power, nutritional knowledge, and awareness about hygienic habits, contribute to growth faltering. It

follows, therefore, that growth differentials, especially among infants from low and high socio-economic class, would reveal the critical role played by feeding and weaning practices in these communities. The present study addresses the issue by examining the growth and feeding and weaning practices of infants from high and low socio-economic classes from Pune city.

Material and Methods

Information on 225 infants; 75 infants from a locality of well-to-do families and 150 infants from the nearby slum area was collected (*Table I*). Mothers were interviewed for getting detailed information regarding age, sex and birth order, duration of breastfeeding, initiation of weaning, type and frequency of weaning food and dilution in case of liquid weaning foods. Family information such as size, father's occupation, and number of preschool children was also obtained to distinguish social class related differences.

Weights were recorded using a spring balance. For recording weights of the infants, the difference method, *i.e.*, weight of the mother and infant together minus weight of mother, was used. Height was

measured in centimeters using standard procedures. In order to assess the nutritional status, the two commonly used anthropomorphic indicators, *viz.*, weight for age, and height for age were used.

Infants who were still on breast and were not offered any supplementation were considered as exclusively breastfed ("BF") while those for whom breastfeeding was completely stopped and were fully fed on top food were considered as "AF" and the others represented partial breastfeeding with supplementation, *i.e.*, "BF+AF". Age-sex distribution of infants in the study is given in *Table I*.

Results

Infant feeding and weaning practices differed in two socio-economic classes. Thus proportion of infants weaned before 4 months of age was significantly higher ($p < 0.01$) in HSE (84.1 vs 55.7% in LSE) while proportion weaned beyond 6 months of age was significantly higher ($p < 0.010$) in LSE (27.1 vs 47.3%) received cow's milk as supplementation, but proportion of infants receiving buffaloes' milk was similar in both the classes (37%). It was, however, noted that about 13% of LSE infants were directly switched on to solid foods without liquid or semiliquid transitional food.

The differences in the growth of infants from two socio-economic classes are given in *Fig. & Table II*. LSE infants in fact had lower weights and heights, compared to HSE infants, but differences were statistically significant ($p < 0.001$) in case of females. The extent of malnutrition in the two socio-economic classes was, therefore, estimated using two commonly used anthropometric indicators, *viz.*, weight for age and height for age and height for age.

Almost all infants from HSE class were

TABLE I—Age and Sex Distribution of Infants from Two Socio-economic Classes

Age group (mo)	LSE		HSE	
	M	F	M	F
0-6	48	43	17	14
6-12	30	29	23	21
Total	78	72	40	35

LSE: Low socio-economic group; HSE: High socio-economic group; M: Males, F: Females.

TABLE II—Average (\pm SD) Weight and Height of Infants from Two Socio-economic Classes

Age group (mo)	No of children	LSE		No of children	HSE	
		Wt (kg)	Ht (cm)		Wt (kg)	Ht (cm)
Males						
0-2	10	4.03 \pm 0.85	54.7 \pm 4.95	3	4.20 \pm 0.51	57.2 \pm 1.04
2-4	19	5.46 \pm 0.63	60.3 \pm 3.23	6	5.37 \pm 0.70	58.2 \pm 3.30
4-6	19	5.95 \pm 1.03	61.9 \pm 3.99	8	6.63 \pm 0.82	64.0 \pm 3.23
6-8	13	7.04 \pm 1.03	64.1 \pm 3.35	8	7.81 \pm 0.67	69.2 \pm 3.18
8-10	9	7.47 \pm 0.85	67.6 \pm 2.72	7	8.93 \pm 1.64	71.8 \pm 8.17
10-12	5	8.50 \pm 2.12	71.4 \pm 2.82	8	10.37 \pm 0.94	71.9 \pm 5.11
>12	3	9.58 \pm 1.83	74.1 \pm 2.16	—	—	—
Females						
0-2	1	4.53*	55.9*	2	4.25 \pm 0.51	59.1 \pm 1.04
2-4	18	4.59 \pm 0.86	55.9 \pm 3.99	7	5.14 \pm 0.95	59.7 \pm 2.72
4-6	24	5.60 \pm 0.71	60.3 \pm 3.61	5	6.55 \pm 0.51	65.3 \pm 1.52
6-8	10	5.87 \pm 1.36	62.4 \pm 3.84	10	7.93 \pm 0.69	67.6 \pm 3.49
8-10	10	6.50 \pm 1.17	65.9 \pm 4.59	5	9.10 \pm 0.72	71.8 \pm 2.49
10-12	7	8.04 \pm 0.89	69.9 \pm 1.80	6	9.58 \pm 0.73	73.7 \pm 2.7
>12	2	8.25 \pm 1.25	71.7	—	—	—

*Samples size being small, SD has not been calculated.

normal and magnitude of malnutrition was negligible (Table III). On the other hand 40 to 25% infants from LSE class were both underweight and stunted, respectively. It is, therefore, necessary to examine the extent of malnutrition in relation to feeding practices.

Table IV shows that exclusive breastfeeding was not continued beyond 4 months of age among HSE class and 55% of infants received supplementation even before 4 months of age. By the age of 12 months, 71% of infants were fully weaned. Contrary to this, for 24% of infants in LSE

exclusive breastfeeding continued well beyond 6 months of age and only 6% infants were fully weaned at the age of 12 months. Prolonged breastfeeding (either exclusive or partial) seemed to be common in LSE class.

Malnourished (moderate and severe) infants were cross classified by type of feeding in Table V. Since there was hardly any infant in the moderate or severe grade among HSE infants, the figures are given for LSE class only. Although the number of top fed infants was very small in LSE, most of these infants were malnourished.

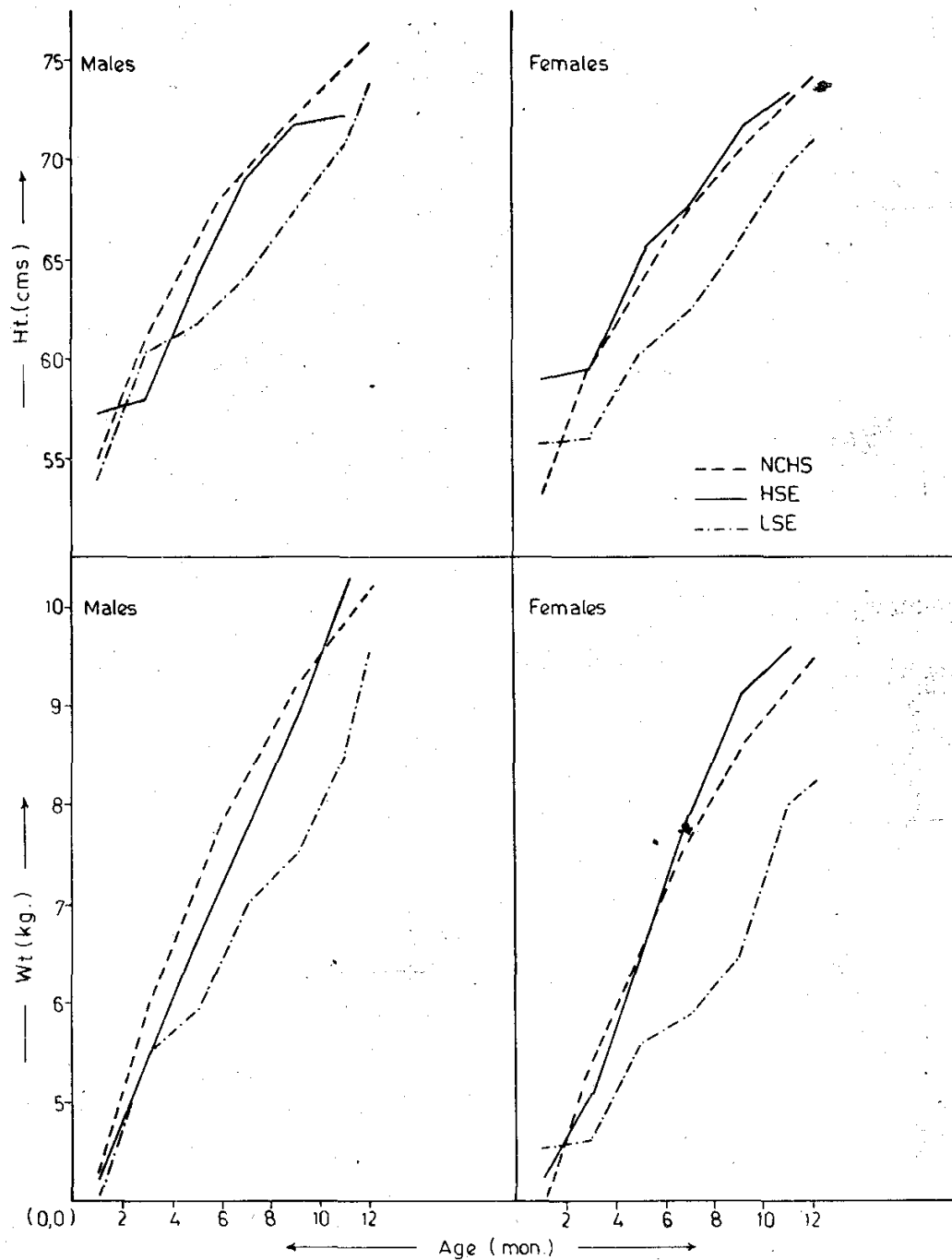


Fig. Average weight and height for male and female infants from LSE and HSE.

On the other hand in HSE, despite the fact that artificial feeding was common (Table IV), none of the top fed infants was malnourished. Clearly, weaning foods given in LSE were not adequate in quality or quantity. It may be worthwhile here to mention that 70% of the mothers in LSE class diluted the top milk with equal amount of water, while in HSE class, the extent of

dilution was not only less but decreased as infant advanced in age.

The important point revealed from Table V is that the proportions of malnourished infants among BF+AF group are smaller (3 to 11%) compared to infants in AF category (25 to 100%) and are similar with proportions in BF group (2 to 8%). The suggestion is that partial breastfeeding

TABLE III—Estimates (%) of Grades of Malnutrition in two Socio-economic Classes

Indicator	Grades of malnutrition	LSE		HSE	
		M (n = 78)	F (n = 72)	M (n = 40)	F (n = 35)
Wt for age	N	79.5	56.9	92.5	97.1
	ML	16.6	30.6	7.5	2.9
	MD	2.6	8.3	—	—
	SEV	1.3	4.2	—	—
Ht for age	N	85.9	75.0	92.5	97.1
	ML	11.5	15.3	2.5	2.9
	MD	1.3	5.5	2.5	—
	SEV	1.3	4.2	2.5	—

N: Normal; ML: Mild malnutrition; MD: Moderate malnutrition;
SVE: Severe malnutrition; M: Males; F: Females.

TABLE IV—Distribution (%) of Infants According to Feeding Type for two Socio-economic Classes

Age group (mo)	LSE				HSE			
	N	BF	BF+AF	AF	N	BF	BF+AF	AF
0-4	48	75.0	22.9	2.1	18	33.3	55.6	11.1
4-6	43	76.7	23.3	—	13	—	64.5	35.5
6-10	42	23.8	69.0	7.2	30	—	46.7	53.3
>10	17	5.9	88.2	5.9	14	—	28.6	71.4

TABLE V—Extent (%) of Malnutrition (MD+SEV) in LSE Infants by Type of Feeding

Indicator	Sex	BF		BF+AF		AF	
		n	%	n	%	n	%
Wt for age	M	41	2.4	31	3.2	4	25.0
	F	38	7.9	34	11.8	2	100.0
Ht for age	M	41	4.8	31	2.9	4	25.0
	F	38	5.4	34	9.7	2	100.0

beyond six months of age seems to play beneficial and influential role in reducing risks of malnutrition. In fact benefits of partial breastfeeding beyond 6 months outweigh the risk of contamination associated with offering weaning food in such communities. Finally, it may be noted that in all the feeding groups, proportions of malnourished female infants were considerably higher compared to male infants.

Discussion

Despite the extensive description of unique qualities of human milk, the need for further investigations in view of the increasing realization of its significance, continues especially in the less developed countries. During the critical period of infancy, particularly after first half, feeding and weaning practices play important role in determining the growth of an infant. The main intention of the study was, therefore, to observe the impact of feeding and weaning practices in relation to growth of infants from low and high socio-economic classes.

It was thus observed that artificial feeding was more common in HSE class, while prolonged breastfeeding was a rule in LSE. Despite this, the proportion of malnourished infants was negligible among HSE infants, indicating that the weaning foods offered were adequate, both in quality and quantity. In LSE, infants received top milk diluted with equal amounts of water, which not only reduces nutrient intake, but increases risks of contamination. As such, 40% of the infants from LSE were malnourished.

Benefits of exclusive breastfeeding have been reported earlier by many studies (9-11). Upto four months' of age, *i.e.*, during the period of exclusive breastfeeding, average weights and heights of male infants

from the two socio-economic classes were not significantly different. However, beyond 4 months of age, no infant was exclusively breastfed in HSE and therefore, optimum duration for adequacy of breast milk could not be estimated. Nevertheless, most infants exclusively breastfed beyond four months of age in LSE revealed lower weights and heights indicating that breast milk alone is not adequate beyond four months of age.

Partial breastfeeding upto 12 months among LSE infants was observed to exert beneficial impact in terms of reducing risks of malnutrition. Thus proportion of infants malnourished among BF+AF and BF group were similar (3.2 and 2.4%, respectively in males and 11.8 and 7.9%, respectively in females) and significantly smaller than top fed infants (25 and 100% in males and females, respectively).

The findings thus underscore the fact that partial breastfeeding upto 12 months age outweighs risk associated with contamination of weaning foods in poor communities where most mothers are not educated. While the successful performance of artificial feeding in high socio-economic class leaves no doubt that the real need is to offer proper health education to mothers in poor communities. All the feeding groups indicated gender bias towards female child even during infancy revealing social dimension of the problem, in poor communities. Promoting proper feeding and weaning practices through health education to mothers is, therefore, the crucial need for improving nutritional status of infants in poor communities.

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NOTES AND NEWS

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A group on Childhood Disability has been formed under the aegis of the IAP. This is a multidisciplinary group which will be working for the welfare of disabled children of the country. The aim of this group is to collect information from all over the world regarding their prevalence, management and rehabilitation of these children. Educating the parents will also be one of the aims of this group.

Membership fees:

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|--|------------------------------|
| 1. Ordinary Member | Rs. 100/- per year <i>or</i> |
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Members interested in the total welfare of disabled children are requested to apply for the membership of this group to:

Dr. S.D. Singh,
 Professor and Head,
 Department of Pediatrics,
 11, Film Colony, Indore.