Original Articles

COST OF INFANT FEEDING IN EXCLUSIVE AND PARTIALLY BREASTFED INFANTS

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Objective: *To compare the costs incurred on infant feeding between the mothers who exclusively breastfed their infants and those who introduced supplements up to 6 months of age.* ***Design:*** *Longitudinal follow up.* ***Setting:*** *Urban slums of south Delhi.* ***Methods:*** *One hundred normal mother infant pairs fulfilling the prelaid criteria were recruited at the time of birth and followed up for determining the feeding practices. The cost of feeding was estimated at prevalent market prices in terms of food supplement and medical treatment of infant and additional nutritional intake of mothers. The differences in costs in exclusively and partially breastfed groups were analyzed at 3, 4, 5 and 6 months of age.* ***Results:*** *Their was a sharp decline of exclusive breastfeeding from birth to six months. The mean cost of infant feeding was Rs. 204/-per month in partially breastfed as compared to Rs. 106/- in exclusively breastfed at 6 months of age. The increased cost was largely attributable to supplementary food and the cost of feeding bottles. (83% of mothers used bottles).* ***Conclusion:*** *The mean cost of infant feeding is substantially higher in partially breastfed children.*

Key words: *Breastfeeding, Urban slum, Supplementary feeding.*

THE practice of exclusive breastfeeding is showing a decline and the present day mothers tend to introduce supplementary milk as early as 2-3 months of age(l-3). Supplementary feeding requires not only the purchase of breast milk substitute but also of the bottle, nipple, and fuel for their boiling and refrigeration for storing. At the macro level, the infant feeding choices made by an individual family can have substantial economic impact (2,4,5). The present study was undertaken to compare the costs incurred on feeding infants up to 6 months of age amongst the mothers who exclusively breastfed the infant and those who introduced some nutritional supplements (providing calories) any time before 6 months of age.

Subjects and Methods

The study was carried out on 100 mother-infant pairs participating in a longitudinal multicentric study on the "Duration of lactational amenorrhea in relation to breastfeeding practices", at New Delhi Center. The study was sponsored by the WHO at the National Institute of Health and Family Welfare, New Delhi. Data for this sub study was collected from only those mother-infant pairs who continued in the study till 6 months and above since the criterion for discontinuation for the main objective was appearance of menstruation. Mothers were

recruited at time of child birth from the maternity centers and homes in south Delhi slum colonies. These subjects did not have any complications during pregnancy, had a normal delivery at full term and weighed 40 kg or more at time of birth. Only those infants qualified who were singleton and weighed not less than 2.5 kg at birth. Mothers and infants fulfilling the above defined criteria entered into the prospective study and naturally selected themselves into exclusively and partially breastfed groups.

Attempts were made to compile the costs for two modes of infant feeding, defined as: *(i) Exclusive breastfeeding (EBF)*-when the infant had received breast milk from the mother and may have received water, drops and syrup forms of vitamins, minerals and medicines; and *(ii) Partial breastfeeding (PBF)-When* a breastfed infant received additional milk or milk based fluids, other caloric fluids, solids and semi-solids. The costs were determined by including: *(i)* Cost of infant feeding bottle and its accessories; *(ii)* Cost towards additional nutritional intake of mother attributed to breastfeeding; and *(iii)* Expenditure incurred on the medical management of the infant during sickness in terms of doctor's fee, medicines, tonics or hospitalization. In order to assess the costs, some questions were asked from the mothers: *(i)* Related to mothers additional nutritional intake: Whether the mother was taking any special dietary supplement because she was breastfeeding, and if so the name, and quantity consumed per day; *(ii)* Related to supplement given to infants: Whether the infant received any food or fluids other than breast milk and if so, the total amount and estimated expenditure per day. The type and cost of infant feeding bottle, nipple and method of boiling and cleaning, was also ascertained; and *(iii)* Related to morbidity of infant: Whether the infant had any episodes of illness their nature, duration of illness and estimated expenditure on consultation, medicines or hospitalization. Mother-infant pairs were visited at two weekly intervals by two field investigators who were trained for data collection. For quality maintenance, 10% of the sample was randomly validated by a trained supervisor in the field. After receiving the data, scrutiny of all schedules was done. Errors were not allowed beyond 5% of limits. Mothers were required to maintain daily record charts on a pre-designed format on number and frequency of breastfeeding, supplements given and their quantity and medicines in case of sickness of the infant. Mothers who did not keep the records for 2 consecutive fortnights or weaned the child off were not included in this study. The costs were calculated uniformly at prevalent market prices by the supervisor and checked with mother's version. Analyses were performed at the infant ages of 3, 4, 5 and 6 months, respectively. The Mann-Whitney U test was calculated to analyze the data to elicit significant difference, if any, in two modes of infant feeding.

Results

Most infants moved rapidly from exclusively breastfed group to partially breastfed group; at 6 mo, only 20 infants were left in the former group. The mean cost of infant's supplements was zero in the exclusively breastfed group. The partially breastfed group incurred a mean cost of Rs at 3 mo, Rs. 408.2 at 4 mo, and Rs. at 6 mo age including the cost of feeding bottle *(Table I).* It was observed that most mothers who belonged to lower and middle class did not use any infant feeding formula or tinned products. The usual practice was to use commonly available cow/buffalo milk or from Delhi Milk Scheme or Mother Dairy. Only in 28% of the supplemented infants, a mix of formula feeds and dairy milk was used. About 17-20% mothers fed the supplementary milk with indigenous katori/tumbler and spoon, while 83% mothers used the bottles

made of unbreakable silicone polyvinyl and some preferred bottles made of stainless steel which are everlasting. The mean cost incurred on the bottles, nipples, cleaning brushes, detergents and boiling added to Rs. 300.00 (± 8.4) in 6 months or Rs. 50.00 per month.

All mothers took additional food till about 8 weeks or more after child birth because they were breastfeeding. Consumption of special dietary supplements usually included cereals, milk, eggs, animal oil, jaggery, sweets and special preparations like panjeri and ladoos. *Table I* shows the mean cost of such additional foods. The expenditure on mother's intake was higher in exclusively breastfed group to start with, but became almost equal at 4 months. By 5 months the increase was higher in partially breastfed mothers who expressed that they increased nutritional intake because of perceived insufficiency of breast milk. However, the mean cost of additional supplementation evened out at 6 months. The mean number of days of infant's morbidity and related cost of treatment differed in the two groups at different ages but the differences were no significant.

It may also be noted that the average rate of increase of costs, per month was about three times higher in partially breast

TABLE I–*Mean Cost of Infant Supplement, Mothers' Additional Nutritional Intake and Medical Treatment of Infant*

Infants' age (months)		Number	Cost in Rupees			Total cost	Mean of total cost per month
			Infant supplement & feeding bottle	Mothers' nutritional intake	Treatment of infant		
3	EBF+	64	Nil	527.8 (+ 275.0)	18.7 (+ 33.5)	546.5 (+ 289.2)*	182.0
	PBF++	36	354.5 (+ 133.4)	477.4 (+ 214.3)	21.3 (+ 29.4)	853.2 (+ 238.8)	284.0
4	EBF	47	Nil	552.3 (+ 277.5)	32.9 (+ 26.6)	585.2 (+ 292.4)*	146.0
	PBF	53	408.2 (+ 134.8)	555.8 (+ 278.8)	36.6 (+ 32.0)	950.6 (+ 293.2)	250.0
5	EBF	28	Nil	549.5 (+ 295.8)	63.9 (+ 34.7)	613.4 (+ 315.0)*	122.0
	PBF	72	493.7 (+ 140.2)	584.3 (+ 286.2)	60.3 (+ 27.3)	1138.9 (+ 284.6)	227.0
6	EBF	20	Nil	548.0 (+ 205.0)	87.7 (+ 42.5)	635.7 (+ 348.2)	106.0
	PBF	80	639.6 (+ 103.5)	532.5 (+ 255.8)	52.2 (+ 23.8)	1224.3 (+ 285.2)	204.0

+ Exclusive breastfeeding; ++ Partial breastfeeding; *Significant at $p < 0.05$; Calculated Standard Deviation (SD) given in parentheses.

feeding group. The total cost of infant feeding remained significantly higher in partially breastfed.

Discussion

This community study has estimated the actual expenditure incurred on feeding in two groups of mothers, who have either exclusively breastfed their infants or added supplementary nutrition uptil the age of 6 months. Amongst the women under study there was a sharp decline of exclusive breastfeeding from birth to six months. Only 20% infants were exclusively breastfed at six months of age. A similar trend was observed from Punjab where only 17% infants below six months were being exclusively breastfed (l). In our study more than half the mothers started supplementary feeding by 4 months of age. Most mothers used feeding-bottles (77%-83%) for supplementary feeding. This finding is different from the figure of 23% reported from Bombay slums(6) where the prevalence of bottle feeding was highest (38.5%) at 6 months of age.

The study highlights and quantifies the substantial economic advantage of exclusive breastfeeding over partial breast-feeding in infants below 6 months of age in a typical setting of developing country. These findings are in agreement with earlier thinking(2,4,5). The increased cost in the partially breast feds were largely attributable to supplementary feeding and the bottles. Thus the partially breastfed mother spent Rs. 98/- per month extra on infant feeding. It is concluded that exclusive breastfeeding offers substantial economic advantage.

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