MORTALITY PATTERNS IN BREAST VERSUS ARTIFICIALLY FED TERM BABIES IN EARLY INFANCY: A LONGITUDINAL STUDY

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ABSTRACT

In this study 500 fall term breast fed and 500 full term top fed babies were divided into 2 groups of weight >2.5 kg and ≤ 2.5 kg each, and were followed up for the mortality pattern. Eight hundred of these completed the full follow up period of 6 months. Neonatal mortality in term babies in the present study was 40 per thousand and mortality during 1-6 months period was 55 per thousand. Early neonatal mortality in breast fed >2.5 kg was 0.55% against 7.8% in ≤2.5 kg breast fed babies. The corresponding figures in artificially fed was 1.17% and 9.37% respectively. Late neonatal mortality in breastfed >2.5 kg was 0 and in ≤ 2.5 kg was 2.14%. These values in artificially fed were 0 and 3.12%, respectively. Mortality in 1-6 months period in breast fed >2.5 kg was 0.64% and in ≤ 2.5 kg was 15.5%; and in artificially fed 1.66% and 23% respectively. Thus LBW babies whether breast fed or artificially fed had higher mortality and artificially fed had overall higher mortality in comparison to breastfed. It is concluded that attention should be directed towards promotion of breast feeding and on prevention of low birth weight for decreasing mortality in early infancy.

Key words: *Neonatal mortality rate, Breast fed, Low birth weight.*

Due to its high quality of nutrients and provision of immunity, breast milk has been advocated as the exclusive feed for young infants especially in the contaminated environment of developing countries(l). Apart from protection against diarrhea, respiratory and other infections(2,3) it has many practical and psychological advantages over artificial feeding. The present study attempts to document mortality patterns in exclusively breast fed and artificially fed babies.

Material and Methods

One thousand term babies without congenital malformation delivered in the Department of Gynecology and Obstetrics, Patna Medical College and Hospital, Patna were followed up for 6 months. Gestational age of the babies was assessed by the date of the mothers last menstrual period and date of quickening. When these were not known with certainty, Dubowitz criteria for gestational age were used(4). Both groups were matched for socio-economic status.

Five hundred babies were breast fed and 500 were artificially fed for various reasons. All were given demand feeding. Mothers of artificially fed babies were repeatedly given instructions regarding feeding techniques and hygiene. All mothers were given weaning instructions, when babies were over 4 months of age.

The first follow up visit was 2-3 weeks after discharge from hospital and subsequent visits were at monthly intervals.

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Babies not coming for two consecutive visits were contacted by post or a home visit, but a sizeable number were lost to follow up and only 800 could be studied for the entire 6 months. Babies were weighed on a Detecto scale, after adjusting the 7.ero error, and on the basis of birth weight were divided into those weighing more than 2.5 kg, and those weighing less than 2.5 kg (low birth weight).

Breast fed babies who shifted over to artificial feeding were excluded from the study. Mortality was noted at each visit and mortality rate calculated per 1000 live births. Mortality patterns were divided into three groups: *(i)* Early neonatal (deaths within 7 days of life); *(ii)* Late neonatal mortality (deaths from 8th to 28th day of life); and *(iii)* Mortality during 1-6 months.

Results

Table I summarises the reported reasons for resorting to artificial feeding by the mothers.

Out of 500 each, of breast fed and artificially fed babies, 360 breastfed and 340 artificially fed infants were >2.5 kg; the rest were <2.5 kg. At the end of 6 months, 400 breast fed and 400 artificially fed babies remained in the study, of whom 310 and 300 babies, respectively on follow up were not LBW *(Table II*).

Mortality was significantly higher in LBW babies at all periods ($p < 0.001$) and in artificially fed babies ($p < 0.001$) *(Table III).* While sepsis was the commonest cause of death in early neonatal period especially in LBW babies, diarrhea caused most deaths after the age of 7 days *(Table IV).*

TABLE I- *Reasons for Artificial Feeding (n=500)*

	Reasons	n	%	Number
1.	*Maternal illness*	50	10	
	Rheumatic heart disease			5
	Active tuberculosis			10
	Puerperial sepsis			15
	Jaundice			5
	Psychosis			2
	Nephritis			2
	Chronic poor nutrition			7
	Severe debility			2
	Severe Neurosis			2
2.	*Lactation failure*		175	35
	Primary			45
	After caesarian section			105
	After postpartum hemorrhage			15
	After eclampsia			10
3.	Maternal death/separation	10	2	
4.	*Psychosocial*	30	6	
	Single mothers	18		
	Working mothers	12		
5.	Poor lactation (by self assessment)	160	32	
6.	Non-specific reason	75	15	

Discussion

In the present study, "lactation failure" was the commonest reason for resorting to artificial feeding and in most cases, could be prevented by early initiation of breast

feeding, adequate motivation and support during pregnancy and after delivery, and adequate postpartum care(5). The second most common cause was poor lacatation assessed by the mother herself, mainly because of initial prescription of prelacteal feeds and milk powder, mother's inadequate knowledge about when to begin breast feeding and inclination towards advertised baby foods(5).

Sepsis was the major cause of mortality in early neonatal age group especially in LBW babies and in artificially fed babies. Ashraf *et al.(6)* have also observed that breast feeding offers protection against neonatal sepsis in a poor community.

Diarrhea was the main cause of mortality in 1-6 month period, particularly in the LBW artificially fed babies(7-10). Breast feeding appears to offer protection against deaths from diarrhea in the first few months of life.

The present study points out that in the prevalent Indian conditions, mortality rates

TABLE II–*Distribution of Neonates According to Birth Weight and Type of Feeding*

Age (mo) ± 1 wk	Birth weight			
	>2.5 kg		<2.5 kg	
	BF	AF	BF	AF
0	360	340	140	160
1	340	322	120	135
2	334	325	115	125
3	330	320	109	118
4	325	315	105	115
5	315	308	95	105
6	310	300	90	100

BF = Breast fed; AF = Artificially fed

TABLE III–*Pattern of Mortality in Relation to Birth Weight and Feeding*

Birth weight	Mortality					
	Early neonatal		Late neonatal		Post neonatal	
	BF n(%)	AF n(%)	BF n(%)	AF n(%)	BF n(%)	AF n(%)
>2.5	2 (0.55)	4 (1.17)	0	0	2 (0.64)	5 (1.66)
<2.5	11 (7.8)	15 (9.37)	3 (2.14)	5 (3.12)	14 (15.5)	23 (23.0)

BF = Breast fed; AF = Artificially fed

TABLE IV–*Causes of Death*

Period causes	Breast fed		Artificially fed	
	>2.5 kg	<2.5 kg	>2.5 kg	<2.5 kg
Early neonatal				
Asphyxia	1	3		3
Birth trauma			1	
Sepsis	1	6	3	8
Meningitis			1	
Aspiration		2(1.4)		3
Late Neonatal				
Sepsis		2		3
Diarrhea		1		2
Post Neonatal				
Respiratory illness	2	5	2	5
Diarrhea		7	3	12
Meningitis		2		6

even for term babies are dependent on birth weight and on type of feed. To reduce infant mortality rates, the prevalence of low birth weight should be reduced and breast feeding should be promoted.

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