Original Article

Exclusive Breastfeeding among Preterm Low Birth Weight Infants at One Month Follow-up after Hospital Discharge

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Abstract

Background: *Establishment and maintenance of breastfeeding in preterm low birth weight (PT LBW) neonates after discharge from hospital is challenging and may be affected by multiple factors. We designed this study to find out the association of these factors with breastfeeding in our population.* ***Objectives:*** *To observe the rate of exclusive breasrfeeding (EBF) among the PT LBW neonates at one month follow up and to identify the factors that are related with the maintenance of EBF.* ***Materials and Methods:*** *This observational study was conducted during the period from July 2009 to October 2011 in Enam Medical College Hospital (EMCH). Preterm infants ≤ 34 wks gestation, stayed in the NICU for >3 days and discharged home were eligible. Mothers were interviewed at one month follow-up after discharge. Infants who were given only breast milk up to 4 weeks were termed as "Exclusively breastfed (EBF)" and who were given formula milk in addition were labeled as "Nonexclusively breastfed (NEBF)". Baseline information regarding maternal demography, delivery of the baby, feeding during discharge was taken from database of neonatal ward.* ***Results:*** *Among 89 infants, 37 (42%) were female and 52 (58%) were male, including 5 twins. Gestational age ranged from 29 to 34 weeks (mean 32±2), and birth weight ranged from 1100 to 2200 grams (mean 1763±20 g). At one month follow up visit 19% (17/89) were found to be NEBF and 81% were EBF. Factors significantly associated with EBF were shorter duration of hospital stay (p=0.001), method of feeding at discharge (p=0.001), mode of delivery (p=0.004), below average socio-economic status (p=0.03), maternal education (p=0.02), number of antenatal visits (p=0.02) and larger birth weight (p=0.038).* ***Conclusion:*** *A variety of factors may affect EBF in PT LBW babies. Extensive counseling of the mothers during antenatal visits, counseling of the family members regarding the advantages of exclusive breastfeeding is necessary. Support should be provided for the mothers both in the hospital and also outside the hospital for a long period.*

Key words: *Exclusive breastfeeding, Preterm low birth weight (PT LBW)*

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Introduction

The establishment and maintenance of breastfeeding is one of the health goals of Bangladesh.[1] There are many advantages of breastfeeding, and generally it is regarded as the best way to feed a baby.[2,3] Breastfeeding benefits preterm infants from nutritional, gastrointestinal, immunological, developmental, and psychological perspectives.[4-6]

Though breastfeeding at birth is the norm in Bangladesh, some factors influence breastfeeding rates.[7,8] The admission of a baby to an intensive care

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unit is a factor which interferes with the breastfeeding of a baby. The milieu of the neonatal intensive care unit (NICU) has a large influence on breastfeeding rates and a number of hurdles must be overcome before a sick infant is discharged home breastfeed.[1,9] Breastfeeding PT LBW infants present unique challenges that include initiating, establishing and maintaining adequate milk supply.[6] Mothers delivering prematurely are more likely to experience delivery complications; they face significant stress regarding their infant's health and thus initiation of breast feeding is troublesome.[9] Once breastfeeding is established in NICU and the baby is discharged home, it is very essential to ensure the continuation of breast milk feeding .

Sociodemographic and attitudinal determinants of breastfeeding initiation and duration among mothers of healthy term infants have been investigated in numerous studies.[10-12] Fewer studies have focused on the challenges faced by mothers of LBW infants. To improve lactation programs and increased duration of breast milk feeding in PT LBW infants, it is important to study the experience of breast milk feeding in mothers. Therefore, the objectives of this study were to observe the rate of exclusive breastfeeding (EBF) among the PT LBW neonates at one month follow-up and to identify the factors that hindered or supported the maintenance of EBF.

Materials and Methods

This observational study was conducted during the period from July 2009 to October 2011 in Enam Medical College Hospital (EMCH). EMCH NICU is a 16 bedded tertiary level health care unit. There is a database where the information record forms are entered for every neonate. Short demographic, maternal and neonatal records are kept in the database. The NICU has an existing supporting program to initiate, promote and maintain breast milk intake in infants. All mothers of the admitted newborns are provided lactation counseling. Since the establishment of the NICU, no neonate (except two, due to maternal death) was given formula milk or bottle feeding. Sometimes donors' breast milk is given with the consent of both families. Mothers of inborn babies are resided to general obstetrics wards/cabins where they initiate milk expression and expressed milk is transported to the NICU. Mothers delivered outside EMCH are to send milk to NICU once or twice a day. Gradually breast attachment and breastfeeding is started (according to the neonate'clinical condition). At discharge all neonates are breast milk fed (either direct at breast or by cup and spoon). The parents are asked for follow-up visit at one week, one month after discharge and then as appropriate for the baby.

Mothers were interviewed at one month follow-up regarding the status of breastfeeding. Infants who were given only breast milk up to 4 weeks were termed as "Exclusively breastfed (EBF)" and who were given formula milk in addition were labeled as "Nonexclusive breastfed (NEBF)". Baseline information regarding maternal demography, delivery of the baby, feeding during discharge was taken from database.

Education level of the mother has been divided as primary school (completion of class V), high school (completion of SSC) and college and above (HSC to Masters). Regarding socioeconomic status family income per month has been recorded. Less than 15,000 taka per month has been considered as below average or poor, 15,000 to 30,000 per month has been considered as average and more than 30,000 per month as above average.

All preterm infants (<34 wks gestation) remaining in the NICU for more than 3 days were eligible provided that they were discharged home from EMCH. Neonates who were transferred to another hospital for ongoing care, had repeated hospital admission or had congenital malformation that may interfere with feeding were excluded. All parents gave informed consent.

Data analysis

Data were analyzed with the Statistical Package for the Social Sciences, 11.5 (SPSS Inc. Chicago). Selected demographic, maternal and neonatal variables have been compared in EBF and NEBF groups. For continuous variables (maternal age, monthly income, birth weight, gestational age, duration of hospital stay) 'Student's T test' and for categorical variables (maternal education, number of antenatal visits, place and mode of delivery, method

of feeding) 'Chi Squire (c^2)' tests were done as tests of significance. P values <0.05 were considered significant.

Results

Table I demonstrates the sample description. Among 89 infants, 37 (42%) were females and 52 (58%) were males, including 5 sets of twins. Gestational age ranged from 29 to 34 weeks (mean 32 ± 2), and birth weight ranged from 1100 to 2200 grams (mean 1763 ± 120 g). The mean duration of hospital stay of the infants was 6 days (range 4-17 days).

Table I: Characteristics of the infants (n=89)

Parameters	Number	Percentage
Weight (grams)		
<1000	01	1.2
1000-1499	15	17.5
1500- 2499	68	76.5
≥2500	05	5.6
Gestational age (weeks)		
28-<30	06	7.0
30-32	33	37.0
>32-34	50	56.0
Gender		
Male	52	58.0
Female	37	42.0
Gestation		
Single	80	90.0
Twin	09	10.0
Duration of hospital stay (days)		
<7	48	54.0
7-14	38	43.0
>14	03	3.0

Maternal age ranged from 16 to 36 years (median 25 years) and almost half were primiparous (43/89). Most of the mothers underwent caesarean section (64%). All mothers received at least two antenatal visits (ranging from 2 to 10). Education levels ranged from illiterate to Masters degree (table II). Only 3 mothers had visits supplemented with breastfeeding advice.

Table II: Maternal characteristics (n=89)

Parameters	Number	Percentage
Socioeconomic status		
Below average/poor	55	61.0
Average	29	33.0
Above average	05	5.60
Maternal age (yrs)		
<18	05	5.6
18-25	47	53.0
26-35	34	38.0
>35	03	03.0
Maternal education		
Primary school	34	38.0
High school	27	30.5
College and above	28	31.5
Antenatal check up		
<4 visits	60	67.0
≥ 4 visits	29	33.0
Mode of labour		
Normal	32	36.0
Caesarian section	57	64.0
Place of labour		
Home	12	14.5
Other hospitals	28	34.0
EMCH	49	51.5

During hospitalization, all infants received breast milk starting from trophic feeding to full feed. None was given formula or bottle feeding during hospital stay. At discharge all were either direct breast or breast milk fed. Sixty seven percent was fed directly from breast, 19% got cup and spoon in addition to breastfeeding. Direct breastfeeding could not be established in 11% (12 of 89) babies due to maternal nonavailability or sickness. Of them 10 were fed with cup and spoon and 2 neonates were discharged with nasogastric (NG) tube. At one month post discharge follow-up visit 19% (17/89) were found to be supplemented with formula feeding and the 81% got direct breastfeeding or breast milk with cup and spoon (table III).

Table III: Method of feeding at discharge and at one month (n=89)

Parameters	Number	Percentage
Breast milk feeding at discharge		
Direct at breast	60	67.0
Direct breast + cup and spoon	17	19.0
With cup and spoon only	10	11.5
With cup and spoon + NG tube	02	02.5
Feeding at one month		
Direct breastfeeding	58	65.0
Breastfeeding + cup and spoon	14	16.0
Formula feeding with bottle only	07	08.0
Breast feeding + formula	10	11.0

Relationship of maternal, infant and socio-demographic factors with status of breastfeeding at one month is shown in table IV. The neonates who had a shorter duration of hospital stay were found to be exclusively breastfed (p=0.000). Method of breastfeeding at discharge had significant correlation with EBF (p=0.001). Other factors found to be significant were mode of delivery (p=0.004), below average socio-economic status (p=0.03), maternal education (p=0.02), number of antenatal visits (p=0.002) and larger birth weight (p=0.038).

Table IV: Maternal and infant variables in breast milk and formula feeding groups (at one month)

Variables	Breast/ breast milk fed	Formula fed	p value
Maternal age (mean)	25.15 ± 3.2	23.78 ± 3.4	0.06
Monthly income (taka, mean)	7050 ± 250	1875 ±320	0.03
Maternal education			0.021
SSC or below	48	13	
Above SSC	24	04	
Antenatal visit			0.002
< 4 times	47	13	
>4 times	25	04	
Place of delivery			0.053
Home	04	08	
Hospitals	68	09	
Mode of delivery			0.004
Normal	26	06	
C section	46	11	
Gestational age (mean wk)	32.36 ±1.5	32.06 ±1.7	0.490
Birth weight (mean gm)	1763 ± 220	1326 ±240	0.038
Hospital stay (mean days)	5.5 ± 1.2	9.5 ±3.2	0.000
Method of feeding at discharge			0.001
Direct breast	57	03	
Others	15	14	

Discussion

This study has been performed to observe the incidence of post discharge EBF among the PT LBW neonates and different factors that may have association with the practice of EBF.

The incidence of exclusive breastfeeding at one month was 81%. The rate is comparable to the studies performed by Gunn TR et al[6], Lefebvre E et al[9], Kathleen MB[4] and others (incidence ranging from 20% to 77%). Lydia et al[13] in their study have found that among mothers of VLBW infants, rates of discontinuation of lactation before discharge or within 3 months post discharge range from 23% to 80%.

Breastfeeding is a norm in our country and the initiation rate is satisfactorily high.[1,7] But only 43% of our infants can complete the six months duration of EBF.[7] In case of NICU admitted PT LBW neonates the rate would be lower. Mothers usually have informational and emotional support during the NICU stay, but at home adequate support from the family members may not be available. The mother herself may suffer from delivery related complications. Extensive counseling including family members and the mother for a clear understanding about the beneficial effects of breast feeding may reduce the threat of introduction of formula milk.

A number of variables recorded during hospital stay were associated with the practice of exclusive breastfeeding after discharge. The variables were duration of hospital stay, method of breastfeeding at discharge, mode of delivery, maternal education, socio-economic status, number of antenatal visits and birth weight.

Duration of hospital stay depends on the disease condition of the neonates. Staying in the NICU is stressful for the baby and the mother. Milk expression for the baby may not completely empty the breast, which causes breast congestion. Both this mental and physical stress is inhibitory to the process of maintenance of lactogenesis and has an impact on post discharge feeding practice. Mellanie MS et al[10]

have observed that longer duration of hospital stay reduces the incidence of breast feeding at post discharge period. Gunn TR[6] and Furman et al[12] showed that perinatal medical condition of the infant played a unique role in feeding practices in preterm infants. On the contrary TT Colaizy[14] found NICU admission has a positive influence on breastfeeding continuation, improving the overall likelihood by 10%. Mothers of preterm NICU-admitted infants were more likely than mothers of nonadmitted infants to continue breastfeeding for 4 weeks.

Discharging the baby at direct breastfeeding had a positive correlation with post discharge EBF. Feeding at the breast indicates neuro-physiological stability of the baby and also the mother's capability of feeding. When the mothers were successful in feeding at the breast, they described feeling of pride and security. However, when their attempts were not productive, mothers expressed feelings of dis-appointment, frustration, rejection, and inade-quacy, which interfered with continuation EBF. Kathleen et al[4] and Flacking R et al[15] observed similar findings. Nasogastric or cup and spoon feeding at discharge showed to have a negative influence on exclusive breastfeeding in the study of Paula G.[16]

Our study revealed that normal delivery was associated with increased incidence of post discharge EBF practice. Caesarean delivery can interfere with breastfeeding, especially in primiparous women not only because of delayed lactogenesis, but also because the mother's recovery is slower. Iammactalota et al[17] and Lydia et al[13] in their study also revealed that normal delivery is associated with longer duration of EBF.

In the current study there was significant positive association between the level of maternal education and EBF which is in concordance with the results of the study done by Paula G.[16] Other authors like Boo NY[18], Paula M S et al[19] and Friedman et al[20] also indicated that a greater prevalence of breastfeeding at hospital discharge and post discharge was found among very low birth weight neonates whose mothers had comparatively higher level of education. In our context, mothers play a little role in making the decision of breast feeding her baby. Senior family members and in-laws guide the mother. But when the mother is educated, she possesses the decision making capability and can breastfed her baby.

Interestingly, our study demonstrated a negative correlation between the socioeconomic status and incidence of EBF. Khanam et al[11] in her study on EBF have shown that average income in the parents of EBF is lower than the parents of NEBF infants. It is also known from the study of Paula M[19], Friedman S[20] and Meerlo H[21] that the incidence of breastfeeding among mothers of LBW infants is negatively correlated with higher economic status or presence of health insurance. In our country mothers of poor or below average condition are bound to remain attached to EBF at least up to 2-3 months of age due to the high cost of formula milk (approximately taka 432/= per 400 gm container).[11] As soon as the parents can afford to buy a formula milk they start giving it to their babies.

It has been shown that number of antenatal visits is positively correlated with incidence of EBF.[12,14] Our study revealed similar result. We emphasize that breastfeeding counseling should be provided with every antenatal visit. Paula M Sisk[19] found that prenatal consultation with a neonatologist, emphasizing the importance of breastfeeding, significantly increased the length of breast milk feeding both in hospital and post discharge in preterm infants compared to a matched case-control group of infants whose mothers did not receive the prenatal consultation. Gun TR[22] observed similar result. Hill PD[23] showed that antenatal visit to a lactation expert is more helpful for the mothers to remain adherent to breastfeeding.

In our study mean birth weight differed in EBF and NEBF groups. In the similar gestational age groups larger babies were exclusively breast fed in greater frequency. Similar findings were revealed in the studies performed by Wooldridge et al[24] and Kimberly et al[25]. Mean gestational age in our study was 32±2 weeks and the difference between the two groups was not significant. The reason may be the low survival rate of very premature extremely low birth weight neonate .

The results of the current study allow us to conclude that a variety of factors may affect EBF in PT LBW

babies. During the antenatal visits the expectant mothers should be motivated and correctly informed about lactation management and the advantages of exclusive breastfeeding until 6 months of age. Along with extensive counseling of the family members by nursing staffs and doctors in the NICU, more strategies should be adopted that will provide support for mothers both in the hospital and also outside the hospital for a long period. Improvement of the modifiable factors like maternal education and method of feeding at discharge can be improved. The Government should take more initiatives to promote breastfeeding and to train field level workers about methods and benefits of breast feeding.

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