RESEARCH PAPER

Factor Affecting Duration of Exclusive Breast Feeding in Preterm Infants With Gestational Age ≤ 34 Weeks

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Objectives: To study the factors influencing the duration of exclusive breastfeeding (EBF) in preterm (≤34 weeks) infants. **Methods**: This study was done in 113 preterm infants with gestational age ≤34 weeks who were attending the well-baby clinic at the corrected age (CA) of 6 month. The birth details were noted from hospital records and feeding details were collected through a personal interview. **Results**: The mean (SD) duration of EBF was 3.61 (2.3) months, and 35.3% babies had received EBF till CA of 6 month. Operative delivery [aOR (95% CI): 3.8 (1.0, 13.4) *P*=0.037], delay in initiating tube feeding, [aOR; 1.5 (1.0, 2.1); *P*=0.017], and delay in establishment of oral feeds [aOR1 (1.0, 1.08) *P*=0.016] were associated with a shorter duration of EBF. **Conclusion**: The prevalence of EBF till 6 months CA in preterm ≤34 weeks was 35.3%. Earlier initiation and establishment of full oral feeds may help in improving the duration of EBF.

Keywords: *Cesarean section, Risk factors*, *Tube feeding.*

The benefits of exclusive breastfeeding (EBF) for the first 6 months of life are well known . Overall 54.9% of infants in India get EBF [1]. Preterm infants constitute 12% of all live births in India [2] but there is a paucity of data on the duration of EBF, specifically in preterms. This study was done to estimate the prevalence of EBF till six months corrected age (CA) in preterm babies born at ≤34 week gestational age, and to identify the factors influencing it.

METHODS

This cross sectional study was done between August, 2019 and March, 2020 in infants born preterm (≤34 weeks gestational age) in a university teaching hospital. The study was approved by the Institutional Research Ethics Committee of our university. Written informed consent was obtained from the parents of the subjects. The infants were enrolled consecutively for a sample size of convenience at 6 months (+2 weeks) CA from the high risk follow up clinic (routine visit scheduled at 6 months CA as per protocol). Those with congenital malformations, chronic systemic illnesses and with mothers who were employed outside the home or separated from the infant for any reason were excluded. The sociodemographic, birth and neonatal intensive care unit (NICU) stay details were noted from the discharge summary. After delivery, the mothers had received lactation support throughout hospital stay till discharge, and had been counselled to continue EBF after discharge. The details regarding type of feeding and the decision makers on the initiation of complementary feeds (CF) were collected through interview by a single researcher using a structured questionnaire. Modified Kuppusamy classification was used to grade the socio-economic status (SES). The preterm infants were cate-gorised according to the World Health Organization (WHO) definitions as extreme preterm: GA 24 wks+0 days to 27wks+6days; Very preterm: GA 28+0 days – 31+6; Moderate preterm: GA 32+0 days – 33+6 days.

EBF was defined as receiving only mother's breast milk, no other liquids or solids or even water, except oral rehydration solution or drops/syrup of vitamins, minerals or medicines [3]. Corrected age (CA) was defined as chronological age from birth reduced by the number of weeks born before 40 weeks of gestation [3]. Small for gestation age (SGA) was defined as birthweight <10th percentile for gestational age as per Intergrowth 21 chart [3]. Complementary feeding was defined as food, usually semisolid, that is offered in addition to milk to young infants [4].

Statistical analysis: The data were analyzed with IBM SPSS, Version 23.0. For statistical analysis of factors influencing the duration of EBF, duration was categorized as <4 month and ≥4 months CA since 4 months CA corresponds approximately to 6 months chronological age or older for preterm infants born with GA ≤34 weeks. Pearson chi-square test was used to compare the statistical significance of differences in categorical data.

Probability value <0.05 was considered significant. The variables were first analyzed in univariate models; subsequently the variables with a $P<0.5$ were analyzed in a multiple stepwise backward model. For multivariate analysis, logistic regression was done using backward Wald method to get Odds ratio.

RESULTS

Out of 156 eligible infants who presented during the study period, 43 were excluded (32 infants as the mother was employed outside the home, 6 infants due to chronic systematic illness and 5 due to parents' refusal) and 113 infants were enrolled. Of these, 61(54%) were males, 67 (59%) were singleton and 46 (41%) were twins (23 pairs).There were 9 (8%) extreme preterms, 50 (44%) were very preterms and 54 (48%) were moderate preterms. At discharge after delivery, 34 (30%) babies had been on EBF. The mean (SD) duration of EBF was 3.61 (2.3) months. Only 40 (35.3%) had received EBF till 6 months CA and 52 (46%) had received EBF for < 4 month CA. According to modified Kuppusamy classification of SES, 76% of the babies belonged to the upper middle class and 24% to the lower middle class. Among the babies in upper middle class, 57% received EBF for ≥4mon CA while among the babies in lower middle class, 43% received EBF for ≥4mon CA. The difference was not statistically significant.

The risk factors associated with shorter duration of EBF are depicted in **Table I**. The decision to initiate CF was taken by parents, grandparents and healthcare profession in 19.5%, 19.5% and 61% households, respectively. In 44 babies (38.9%), the advice to start CF before 6 months CA was given by a healthcare professional.

On multivariate logistic regression analysis, the independent factors significantly associated with a EBF duration for less than four months were cesarean section delivery [aOR (95%CI) : 3.8 (1-13.4) P= 0.037], delay in initiating tube feeding, [aOR (95% CI) 1.5 (1.0-2.1); P=0.017], and delay in achievement of full oral feeds [OR (95% CI) 1.0 (1.0-1.08), P=0.016].

DISCUSSION

In our study on preterms born ≤34 weeks, 30% were on EBF at discharge, with the rates among the extreme preterm, very preterm and moderate preterm being 12.5%, 14% and 44.8%, respectively. This rate is lower than that reported from Sweden (55%, 41% and 64%) [5] yet similar to that reported from Brazil (15.3%-29.2%) among all preterms [6]. The higher rates in Sweden could be due to the availability of social support and higher education status, since their overall rate of EBF till 6 month is 78% [7] while in India it is only 54.9%.

Table I Risk Factors Associated With Exclusive Breastfeeding for <4 Months (corrected age) in Preterms (<34 week)

Factors	*EBF <4 mo, (n=52*	*EBF ≥4 mo, (n=61)*	*Unadjusted OR (95% CI)*
Males	24 (39.4)	37 (60.6)	1.7 (0.8-3.8)
Gestational age <28 wk	6 (66.6)	3(33.4)	3.4 (0.7-15.1)
Gestation age 28 to <32 wk	26 (52)	24 (48)	1.8 (0.8-4.0)
First born	44 (53)	39 (47)	1.9 (1.0-3.7)
Birth order >1[a]	8 (26.7)	22 (73.3)	(Reference)
Cesarean section	42 (51.8)	39 (48.2)	2.3 (0.9-5.6)
Small for gestational age	8 (53.4)	7 (46.6)	1.4 (0.4-4.1)
Maternal education			
≤ Standard 8	1 (33.3)	2 (66.7)	1.3 (0.1-16.1)
9-12 standard	14 (40)	21 (60)	1.9 (0.1-22.4)
Graduate or higher	37 (49.3)	38 (50.7)	(Reference)
Previous abortions[a]	15 (65.3)	8 (34.7)	3.0 (1.1-8.1)
Duration of NICU stay[a]	26.21(22.6)	17.26(16.8)	1.0 (1.00-1.04)
Tube feed initiated (d)[a,b,c]	1.8 (1.5)	1.19 (1.13)	1.4 (1.0-1.9)
Direct breastfeed initiated (*d*)[b,c]	24.53 (27.9)	21.47 (19.5)	1.0 (09-1.0)
Full oral feeds achieved (*d*)[a,b,c]	18.32 (16.2)	9.16 (11.9)	1.0 (1.01-1.08)
Maternal age (y)[a,b]	31.0 (5.1)	28.62 (4.7)	1.1 (1.0-1.1)
Kangaroo mother care (*d*)[b,c,d]	15.11(12.4)	13.29(18.4)	1.0 (0.9-1.0)

Values in no. (%) or [b]mean (SD). NICU – neonatal intensive care unit. [c]postnatal age,[d]number of days; [a]P<0.05.

WHAT THIS STUDY ADDS?

- Prevalence of exclusive breastfeeding till 6 month corrected age in infants born preterm ≤34 weeks was 35.3%.
- Late initiation of tube feeds and late achievement of full oral feeds were the modifiable risk factors identified.

The prevalence of EBF till 6 month CA in this study was similar to the prevalence reported previously in other studies on preterms [8,9], but lower than the reported prevalence in term babies in NFHS-4 [1]. Previous studies have reported that the duration of EBF in term infants is reduced by maternal factors like insufficient milk production and anxiety as well as medical conditions in the baby including difficulties in establishing suck and swallow [10]. In preterms all these factors are more prevalent.

We found that the EBF rates improved in the very preterm and remained unchanged in the extreme and moderate preterm after discharge, possibly due to the neurological maturation of the infant and maternal psychosocial factors. Other studies have reported the prevalence of EBF till 6 months to be 9.9% in very preterm [11] and 48.5% in the late preterms [12].

In 44 (38.9%) babies, the advice to start complementary feeds before 6 months CA was given by healthcare professional. Though this could have been due to valid concerns of weight, currently there are no clear guidelines on the ideal duration of EBF for preterm babies. The guideline given for term infants is being extrapolated with no clarity on whether the 6 months should be the CA or chronological age for a preterm.

The study had certain limitations. The rate of EBF at discharge was suboptimal (30%). The reason for the HCP advising early initiation of CF was not explored. Also, the mothers were interviewed only when the infants were 6 months CA. Hence some recall bias is expected. However, all mothers seemed to recollect the time of initiation of complementary feeding without any difficulty. The study was private-sector hospital-based with the subjects belonging primarily to the middle class and the mothers had a minimum educational status of grade 8. The factors operating in the other socioeconomic classes may be different.

There is a need to provide clear guidelines on whether the recommended duration of EBF in preterm infants should be based on the CA or the chronological age or on factors other than age such as growth rate or developmental readiness.

Ethics clearance: Research and Ethics Committee, SRIHER (DU); No. NI/19/JUL/70/60, dated Dec 27, 2019.
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