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RESEARCH ARTICLE

Assessment of infant feeding practices of newborns discharged from neonatal intensive care unit of a tertiary care hospital and study of their growth pattern on subsequent follow up visits

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ABSTRACT

Background: Breastfeeding is one of the key factor of reducing neonatal, infant and child mortality rate. While global efforts have significantly reduced child mortality over recent decades, there are still major challenges, especially in countries like India. While breastfeeding has proven long-term health benefits, the practice remains suboptimal. **Aims:** To assess the pattern of infant feeding practices of newborn following discharge from NICU at Tezpur Medical College and Hospital (TMCH) and to study the association between the pattern of infant feeding practices and growth parameters on subsequent follow ups. **Material and methods**: A hospital based observational study with 232 sample size was conducted in the Department of Paediatrics, Tezpur Medical College and Hospital, Tezpur, Assam, India and was carried out among Neonates discharged successfully from the Neonatal Intensive Care Unit of Tezpur Medical College and Hospital, Tezpur, Assam over a period of one year in the state of Assam. Follow up was regularly done at specified interval and was compared among breastfed and non-breastfed infants. Descriptive statistics was used to describe the results. **Results:** Out of total 232 study participants (lactating mother) 94 (40.5%) were included in the exclusive breastfeeding group (EBF) and 138 (59.5) were in the non-exclusive breastfeeding group (non-EBF). The gender wise distribution of the neonates showed that 121 (52.2%) were male and 111 (47.8%) were female. The place of delivery of the maximum mothers (87.9%) was at healthcare facility and only a few mothers (12.1%) delivered neonates at home. The difference between mean anthropometric measurements of exclusively breast-fed infants and non-exclusively breast-fed infants at the end of six months were statistically significant. **Conclusion**: Breastfeeding is one of the key determinants for not only appropriate growth and development but also for infants survival and efforts should be made to initiate early breastfeeding and also to continue Exclusive breastfeeding.

Keywords: Breast feeding, neonate, infant feeding, growth pattern.

There are various factors which can effectively decrease the neonatal mortality rate to a significant level and early initiation of breastfeeding is one of them and it has benefits which extend beyond survival. The World Health Organization has recommended that all the neonates should be breastfed within 1 hour of birth. The harmful effect of infections which are a predictor of increasing infant death rates can be prevented by the early initiation of breastfeeding or human milk feeding and exclusive breastfeeding being the easiest, cost effective and life saving for the newborn [1]. It is seen that neonates who are admitted to NICU represent a population who are at a higher risk for adverse health outcomes when compared to healthy full term neonates [2]. It has been also seen that the infants who are commonly admitted to NICU especially the preterms are comparatively less breastfed post discharge than their healthy peers of full

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term neonates [3].

The probable cause of this phenomenon include the separation of the mother from the neonate, the stress and anxiety of mother which may result in some kind of depressive disorder and the also the clinical status of the mother and or the newborn play an important part [4].

Neonates who are born preterm are generally transferred to the neonatal intensive care unit immediately after birth and hence they are separated from their mothers which finally result in the late initiation of breast feeding [5]. It was found that the early and inappropriate termination of breastfeeding is an important issue leading to increased health problems as well as cost. Complementary foods if are prematurely introduced can have life threatening consequences for many young infants in many settings where the preventive role of breastfeeding for severe infectious diseases is very important for a child survival [6].

Hence, considering all these facts, the present study was conducted with the objective to study the factors influencing breastfeeding, and the comparison of their growth pattern on the subsequent visits.

Materials and methods

The sample size has been taken using convenient sampling method consecutively from January 15th to July 15th 2023 of the patient who has visited Pediatrics' OPD as well as NICU at TMCH, and the total number of sample were found to be 232. Sample has been followed up for 6 months from the day of discharge. Ethical clearance was obtained from Institutional Human Ethical Committee, Tezpur Medical College and Hospital on12.12.2022.

Inclusion criteria: Mothers who had their babies successfully discharged from NICU, TMCH.

Exclusion criteria: Mother or caregivers not willing to take part in the study. Babies lost to follow up. Infants diagnosed with metabolic disease like galactosemia. Babies with congenital malformation associated with difficulty in feeding like cleft lip/cleft palate, babies with neurological deficits at discharge and conditions were breastfeeding was contraindicated.

Study method: All neonates fulfilling the inclusion criteria were included as study subjects. An informed consent was obtained from the mothers or any other caretaker if mother was unable to give consent for any reason. Aim, objective and methodology were clearly explained in their own native language. Parents were also assured that treatment/follow up will not be denied even if they did not give consent. Detailed examination was done for all neonates and infants enrolled in the study. In all cases, the NICU graduates fulfilling the inclusions criteria were subjected for follow up in designated time interval and mothers were also given curated questionnaires for the study. On follow up babies were subjected to clinical examination and weights were taken using digital weighing machine on each follow up. Child length was obtained using an infantometer to the nearest 0.1 cm and body weight in kg to the nearest 10 gm. Head circumference was taken using a measuring tape to nearest of 0.1cm. Follow ups were done at discharge, 8 weeks, 5 months and 6 months. Attempt was made to personally call and ask mothers to come with their babies for follow up to reduce attrition. The clinical evaluation and interview with mothers were done at the Department of Paediatrics, Tezpur Medical College and Hospital, Assam. All the data were collected in a preformed proforma.

Statistical analysis: SPSS version 26 was used for statistical analysis. Mean and standard deviation were calculated for both continuous and categorical variables. Baseline characteristics were compared using 2x2 Chi square test. P value was also calculated. P value < 0.05 was considered statistically significant.

Results

Out of total 232 study participants (lactating mother) 94 (40.5%) were included in the exclusive breastfeeding group (EBF) and 138 (59.5) were in the non-exclusive breastfeeding group (non-EBF). The gender wise distribution of the neonates showed that 121 (52.2%) were male and 111 (47.8%) were female.

The age group wise distribution showed that highest number of mothers 124 (53.5%) less than 25 years and 108 (46.5%) mothers were more than 25 years. Occupation wise distribution showed that most of the mothers 198 (85.3%) were non-working whereas only 34 (14.7%) were working mothers. The place of delivery of the maximum mothers (87.9%) was at healthcare facility and only a few mothers (12.1%) delivered neonates at home. From the mode delivery it was observed that most of the delivery (54.7%) were vaginal delivery (VD) and 45.3% happened by LSCS.

The distribution of breastfeeding status with mother's literacy showed that the highest number of exclusively breast-fed infants (47.9%) were found among secondary pass mother which was followed by (34.0%) primary pass mothers. From the relation of EBF and mother's occupation we have seen that the EBF among working mothers was very poor which only 7.4% was. On the other hand, EBF among

Table 1: Regression analysis of Exclusive breastfeeding with various socio-demographic and clinical characteristics

Variables	Exclusive breastfeeding Unadjusted COR (95% CI)	P value	Adjusted AOR (95% CI)	P value
Mother's age at childbirth (in years)				
<25	Reference		Reference	
≥25	1.092 (0.636 – 1.878)	0.749	1.715 (0.732 – 4.017)	0.214
Mother's Religion				
Hindu	Reference		Reference	
Muslim	0.82 (0.484 – 1.388)	0.460	0.717 (0.348 – 1.476)	0.366
Mother's literacy				
Illiterate	Reference		Reference	
Primary	2.092 (1.025 – 4.266)	0.042	3.073 (1.241 – 7.610)	0.015
Higher Secondary	3.078 (1.542 – 6.143)	0.001	2.899 (1.198 – 7.014)	0.018
Mother's occupation				
Working	Reference		Reference	
Non-working	3.023 (1.257 – 7.270)	0.013	2.470 (0.865 – 7.057)	0.091
Parity				
Primipara	Reference			
Multipara	0.796 (0.470 – 1.349)	0.397	0.587 (0.269- 1.285)	0.183
Type of family				
Joint	Reference		Reference	
Nuclear	0.646 (0.381 – 1.096)	0.105	0.859 (0.425- 1.736)	0.672
Place of delivery				
Home	Reference		Reference	
Govt. facility/Private facility (out-born/inborn)	4.737 (1.586 – 14.145)	0.005	1.394 (0.377 – 5.148)	0.618
Sex of child				
Male	Reference		Reference	
Female	0.868 (0.513 – 1.468)	0.597	0.987 (0.493- 1.977)	0.971
Mode of delivery				
LSCS	Reference		Reference	
VD	4.520 (2.530 – 8.074)	<0.0001	5.547 (2.643 – 11.644)	<0.0001

Table 2: Relationship between infants' weight and EBF practice

Infants weight		Mean ±SD		Range (Min- Max)	P (unpaired *t* test)
At birth	EBF	2.376±0.891	2.432±0.861	1.300 – 3.920	0.418
	NonEBF	2.470±0.842		1.300- 3.960	
At six months	EBF	5.600±0.988	5.247±0.963	3.500-6.900	< 0.0001
	NonEBF	5.007±0.869		3.000-6.300	

Table 3: Relationship between infants' head circumference and EBF practice

Infants head circumference at 6 months	Mean	Standard Deviation	P-value
EBF	41.072	±1.08	4.3142E-218
NON EBF	41.119	±1.02	3.2876E-151

Table 4: Relationship between infants' length and EBF practice

Infants Length at 6 months	Mean	Standard Deviation	P-value
EBF	63.11	±2.85	1.9399E-186
NON EBF	63.26	±2.81	8.496E-128

non-working mother was very high at 92.6%. The EBF status of infants differs significantly with mother's occupation. The distribution of EBF according to place of delivery shows that most of the exclusively breast-fed children (90/94=95.7%) took birth at hospital and only a few children at 4.3% took birth at home. The EBF according to mode of delivery wise distribution revealed that most of the exclusively breast -fed infant observed among vaginal delivery (VD) mothers which was 75.5% and a few infants at 24.5% were seen among LSCS delivery mothers.

Discussion

In the present study it was found that out of total 232 infants, who were followed post discharge for a period of 6 months from our Neonatal Intensive Care Unit, exclusively breastfed during discharge, and 8 weeks were 27.2% and 51.3% respectively which is comparable to the results of the study done by Viswanathan et al [7] in 2019 where they found the incidence of EBF at discharge and at 8 weeks were 20% and 42% respectively.

At the end of 6 months; period of exclusive breast feeding, the rate of exclusive breastfeeding rate was found to be 40.5 % which is comparable to the study done by Nishimura et al [8]. In 2018 where they found the incidence of exclusive breast feeding to be 48.5%, though a study done by Basu P et al.[9]

As per our study delivery in a health facility showed significant rate of more EBF practiced till 6 months of age as compared to the one delivered at home. This study is comparable with the one done by Asemahagn et al[10] and Senanayake et al [11].

The highest numbers of non-exclusively breast-fed infants were found among illiterate mothers comparable to study done by Sharma et al [12] and Ali S et al [13], it may be due to limited access to breastfeeding education and support.

Our study found that the difference between mean weight of exclusively breast-fed infants and non-exclusively breast-fed infants at the end of six months were statistically significant which is consistent to a study done by Dewey et al [14] who found that breastfed infants Grow more rapidly during the first few months and then slowly. In another study done by Gale et al [15] found that also due to more fat accumulation seen in breastfed infants, the difference between the body composition is also different than the formula fed infants during the first 6 months. The rationale between the increased satiety and the weight gain by breastfed infants was due to the low level of m-leptin which was associated with increased milk intake as described by Fields et al [16] and a higher m-leptin in the nonexclusive breastfed infants might be able to support the theory of lower weight gain as compared to the breastfed infants as described by Larson et al [17].

Limitation: The sample size was only 232, and it was conducted at a single center, so the findings might not represent the entire population. A larger, multi-centric study would have been better to accurately capture the burden of the actual problem and provide more comprehensive and reliable data.

Conclusion

Breastfeeding is one of the key determinants for not only appropriate growth and development of a baby but also for infant's survival. Awareness of feeding practices, educational status of mothers and care givers greatly influence the health status of neonate for subsequent growth. Every effort should be made to initiate early breastfeeding and also to continue exclusive breastfeeding. Proper monitoring of growth and early intervention for any failure will positively impact the anthropometric measurements of babies.

Conflict of interest: None. **Disclaimer:** Nil.

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