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Exclusive breastfeeding until six months of age and its influence on anthropometric indices: A prospective observational study

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ABSTRACT

Background: The WHO recommends exclusive breastfeeding (EBF) for the first 6 months of life, for all infants; and prescribes WHO Multicentre Growth Reference Study charts for growth monitoring. However, real-time differences in growth patterns between EBF and non-EBF infants and its influencing factors have not been well documented and analyzed in India. **Aims and Objectives:** We conducted a prospective study to assess the prevalence of EBF and the extent of influence of modifiable and nonmodifiable variables on anthropometric indices among infants from birth to 6 months of age. **Materials and Methods:** Healthy term infants born in a tertiary care hospital in South India were recruited at birth. Sociodemographic data were collected, and diary cards were given to mothers to record daily feeding patterns. Weight, length, and head circumference (HC) were measured using standardized calibrated equipment at birth, 6, 10, 14, and 26 weeks during their routine immunization visits. Data were analyzed and compared for each anthropometric parameter and gain, for each time point and interval, respectively, using SPSS IBM Statistics 22. Generalized estimating equation (GEE) was calculated to assess the independent influence of potential sociodemographic predictors on anthropometric gains. **Results:** The prevalence of EBF among 450 infants (M: F = 1.3:1) who completed the study was 47% at 6 months. The mean duration of EBF was 22.13 weeks (95% CI 18.18–22.57). The GEE analysis showed that the weights, lengths, and HCs of female babies were significantly 392 g, 1.10 cm, and 0.74 cm lesser respectively, compared to male babies across the time period (each $P < 0.001$). Firstborns had significantly lower growth indices than second born infants (each $P \leq 0.02$). Furthermore, among infants not given EBF, their weight was significantly 119 g ($P = 0.02$) less compared to those given EBF. **Conclusions:** Among the significantly influential predictors/parameters, EBF-a modifiable factor, independently influences infant anthropometric parameters positively.

Key words: Exclusive breastfeeding; Anthropometric indices; Generalized Estimating Equation; Prospective study; India

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INTRODUCTION

Breastfeeding is a complete source of nutrition and the gold standard, for the first 6 months of life. The World Health Organization (WHO) recommends exclusive breastfeeding (EBF) till 6 months of age and starting complementary feeds after 6 months of age, while breastfeeding is continued till 2 years or beyond.[1] WHO data for the years 2015–2020 showed that 44% of infants were given EBF till 6 months of age.[2] The National Family Health Survey (NHFS)-4 (2015–2016) and NFHS-5 (2019–2021) reported EBF rates in India as 54.9% and

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63.7%, respectively, with wide regional disparities across varied strata.[3]

Studies have shown that, while "formula-fed" (FF) infants tend to gain weight more rapidly than predominantly or exclusively breastfed (BF) infants, infants exclusively BF till 6 months of age maintained mean weight above the 50th percentile of the WHO-National Center for Health Statistics references (WHO/NCHS) reference growth charts, along with comparatively better gain in length and head circumference (HC).[4-6] Further, results of a systematic review of Randomized Controlled Trials by Kramer and Kakuma in 2012 on "weight for age" and "length for age" outcomes on EBF 6 versus 3–4 months favoured better outcomes for "EBF for 6 months" in developing countries, unlike "EBF for 3–4 months" in developed countries; albeit with no significant difference in HC.[7]

The previously used WHO/NCHS growth charts were based on mostly non-EBF children in the 1960s only from the U.S. In contrast, the currently recommended WHO Multicentre Growth Reference Study charts have been derived from EBF children from six countries between 1997 and 2003 (Brazil, India, Ghana, Norway, Oman, and the United States).[8] The former has become redundant, and the latter is prescriptive.[8] Nevertheless, the actual/real-time differences in growth patterns between EBF and non-EBF infants against the backdrop of its influencing factors have not been well studied, especially in economically transitioning low and middle-income countries like India.

Aims and objectives

In this prospective observational study, we have aimed to assess the incidence of EBF, to compare the anthropometric parameters including weight, length, and HC of EBF infants till 6 months of age with non-EBF infants, and examine the influence of modifiable and non-modifiable variables on infant growth rates in our setting.

MATERIALS AND METHODS

This was a prospective observational study conducted in the Well Baby Immunization clinic of a tertiary hospital, in South India. Term neonates with a birth weight above 2.5 kg were included in the study. Preterm, small for gestational age neonates with any comorbidities such as congenital heart disease, syndromic babies, dysmorphic features, or prolonged NICU stay for any illness, were excluded. Mothers with contraindications for breastfeeding, parents not planning to avail of immunisation at our institution, and those not willing to participate in the study were also excluded. Written informed consent was obtained from all the participating mothers.

Institutional Review Board (IRB) and Ethics Committee approval was obtained before study commencement. STROBE reporting guidelines were adhered to in this manuscript.[9]

Anthropometric measurements

Anthropometric parameters were documented for all included infants at 5 time points- birth, 6, 10, 14, and 26 weeks during their vaccination visit to the clinic, and confirmed by two experienced nursing staff. These staff were trained at the beginning of the study, and retrained every 2 weeks by the Principal Investigator to enable them to follow the standard protocols. Anthropometric measurements for the infants were taken by following standardized procedures.[10,11] We used preferred equipment for standardized anthropometric measurements similar to other studies.[12,13] All anthropometric scales were tested for proper calibration before study initiation, and then every week thereafter by the institution's Mechanical Engineering department.

Weight

The electronic digital weighing scale was used to measure the weights of the infants. On turning the scale on, the appearance of "0" was verified prior to each measurement to ensure that the scale was ready for use. Infants were weighed nude and placed on the centre of the flat scale tray. Weights were taken to the nearest 0.01 kg. Infants were then repositioned, and the weight measurement was repeated and compared to the first measured weight. If the infant was crying, the caregiver held, aligned the baby, and waited till the infant remained stable enough to obtain the constant reading. Final weight was recorded if both weight measurements showed agreement to the nearest 0.01 kg.

Length

Length was measured using a standardized Infantometer. Infants were measured nude on a calibrated length board without socks or shoes. The assistant measurer held the infant's head, enabling the infant to look upward and the crown of the head touching the headpiece, which is the Frankfort Plane. The measurer aligned the infant's trunk and legs, extending both the legs, and bringing the footboard firmly against the feet, holding it in neutral position, but not pressing the feet. Measurement was taken to the nearest 0.1 cm. The infant was repositioned, and measurement was repeated. The staff exchanged their positions for the second measurement to reduce inter-observer variance. Final length was recorded if both length measurements showed agreement to the nearest 0.5 cm.

Head circumference

HC was measured using a flexible, nonstretchable tape. The tape was positioned just above the eyebrows, above the ears,

and over the prominent part of the occiput. Then, the tape was pulled snugly to compress the hair. Measurement was taken to the nearest 0.1 cm. The tape was repositioned, and the second staff repeated measurement to reduce the inter-observer variance. Final HC was recorded if both HC measurements showed agreement to the nearest 0.2 cm.

All the mothers were given structured diary cards to record the feeding details of the infant till 6 months of age. The feeding pattern until the visit (EBF vs. non-EBF), and the respective anthropometric measurements during the visit were recorded in the structured diary cards. Demographic data were collected during their first immunisation visit. All data were recorded in confidential registers, which were entered into a computerized database with password-protected files.

Definitions of breastfeeding patterns

The WHO has classified breastfeeding as exclusive, predominant, or complementary.[14]

a. EBF: The use of breast milk only (including expressed milk or milk from a wet nurse), also including the use of medicine drops, syrups or oral rehydration solution (ORS).
b. Predominant breastfeeding: Breast milk used as a predominant source of nourishment, also including water and water-based drinks, ORS, fruit juice, ritual fluids, and medicines.
c. Complementary feeding: Breast milk use along with any food or liquid, including non-human milk and formula.

In our study, the predominant and complementary breastfeeding infants were grouped together as non-EBF.

Sample size

Based on the NFHS data 2015-16 with prevalence of EBF at 6 months as 48.3% in Tamil Nadu,[15] the sample size was estimated assuming the prevalence being approximately similar to the incidence. A sample size of 400 infants was calculated, with a precision of 5% and a CI of 95%. Expecting a 10% dropout rate, 450 mother-infant dyads were recruited into the study.

Statistical analysis

EPIDATA software was used for data entry. Data analysis was done using SPSS IBM Statistics 22. Descriptive statistics like mean (SD)/median (IQR) were presented for all continuous variables based on the normality assumption. All the categorical variables were presented as percentages and numbers. Statistical significance was measured at $P<0.05$. Statistical analysis was performed using STATA software Version 16.0. Generalized estimating equation (GEE) was used to estimate the relationship of infant growth parameters in a generalized linear model with possible unmeasured correlations between observations from different time points.

RESULTS

We had 450 children included in the study with a male-to-female ratio of 1.34:1 (258/192). Most included infants were born by normal vaginal delivery (65.8%), followed by LSCS (23.3%) and instrumental (10.9%) deliveries. First-, second-, and third-born infants were 60%, 33%, and 7%, respectively. The majority (68%) were born into a joint family, while only 32% were from nuclear families. The mean age of the mothers included in the study was 27.20±3.98 years, with the mean ages among EBF and non-EBF groups being 27.07±3.96 and 27.32±4.00, respectively. While 21.3% of the mothers had primary/higher secondary education, 78.7% were college-educated. Yet, only 12.2 % were working women and the rest were homemakers. Most mothers belonged to the middle-income group of Rs. 10000–50000/month (65%), and only 8% had a monthly income exceeding 50000/month. All infants were given colostrum at birth and 15.3% received pre-lacteal feeds.

The mean duration of EBF among the study population was 22.13 weeks (95% CI 18.18–22.57 weeks), as shown in Figure 1.

Throughout the study period, with increasing chronological age, there was a dynamic cross-over of infants progressively, from the EBF group to the non-EBF group. At birth, 6, 10, 14, and 26 weeks, the percentages of EBF infants were 100% (450/450), 98.4% (443/450), 95.7% (431/450), 87.1% (392/450), and 47% (212/450), respectively.

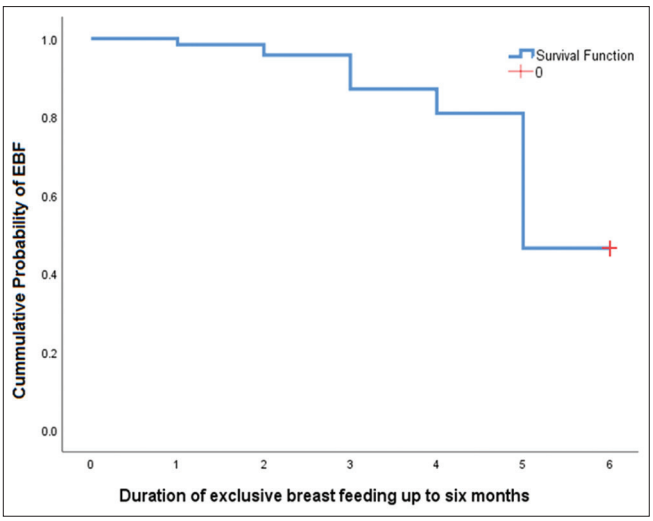

Figure 1: Kaplan-Meier curve for duration of exclusive breastfeeding

Effect of EBF on growth

The mean weight, length, and HC at each visit among the EBF and non-EBF male and female infants are shown in Table 1.

In our study, the mean weight of the EBF infants was significantly higher at 6, 10, and 14 weeks, but not at 26 weeks (overall P=0.015). When the mean weight was compared between male and female infants individually, EBF male infants gained significantly more weight (P=0.014), while there was no such difference noted among female infants (P=0.870). There was a steady increase in length during the assessment period in both the EBF and non-EBF groups, with no significant difference among male (P=0.38) and female (P=0.79) infants. Similarly, the HC also showed a steady increase in both the EBF and non-EBF groups with no significant difference among male (P=0.11) and female (P=0.38) infants.

Next, we compared the gain in the growth parameters at each visit (Table 2).

Except for a significant difference in weight gain during birth to 6 weeks in the EBF group compared to the non-EBF group (P=0.02), the mean weight gain differences at 6–10, 10–14, and 14–26-week durations were not significant. Male infants gained more weight irrespective of the type of feeding they received compared to female infants, at all-time points of assessment, though there was no statistical difference between both EBF and non-EBF male (P=0.53) and female (P=0.26) infants. The length gain was comparable for both EBF and non-EBF male (P=0.06) and female (P=0.75) infants with no significant difference. Similarly, there was no statistically significant difference in gain in HC between male (P=0.11) and female (P=0.38) infants.

Since infants were prospectively followed up at mandatory time points of their routine immunization schedule, the GEE was used to study the effect of the sociodemographic predictors on growth with the change in time (Table 3).

The GEE analysis showed that the weight, length, and HCs of female babies were significantly 392 g, 1.10 cm, and 0.74 cm less compared to male babies across the time periods (each P<0.001). Second-born infants had significantly higher weight (203.19 g; P<0.001), length (0.41 cm; P=0.02) and HC (0.38 cm; P=0.02) than firstborn infants. Furthermore, the weight of non-EBF infants was significantly 119 g (P=0.02) less compared to EBF infants.

DISCUSSION

In our prospective observational study on growth rates of 450 infants, we found that the prevalence of EBF dwindled significantly from 98.4% at 6 weeks to 47% at 6 months, with the mean duration of EBF being 22.13 weeks. The GEE analysis showed that the weights, lengths, and HCs of female infants were significantly lower, respectively, compared to their male counterparts across the time period.

Table 1: Mean weight, length, and head circumference at each infant visit versus type of feeding

Age	EBF			Non-EBF		
	Mean weight (SD)	Male	Female	Mean weight (SD)	Male	Female
Birth	3019.58 (±345.69)	3075.0 (±362.21)	2928.1 (±296.67)	-	-	-
6 weeks	4506.67 (±591.13)	4661.0 (±584.22)	4250.6 (±510.87)	4335.44 (±615.83)	4463.2 (±658.26)	4192.9 (±532.27)
10 weeks	5423.58 (±695.83)	5639.4 (±672.44)	5067.5 (±580.65)	5244.30 (±698.86)	5393.6 (±739.81)	5074.8 (±609.39)
14 weeks	6169.67 (±757.71)	6414.5 (±741.63)	5768.7 (±599.07)	6021.70 (±762.75)	6182.4 (±784.63)	5839.0 (±696.66)
26 weeks	7306.13 (±863.54)	7556.8 (±839.59)	6892.5 (±737.90)	7149.83 (±1056.98)	7397.6 (±835.46)	6871.0 (±1204.68)
Age	**EBF**			**Non-EBF**		
	Mean length (SD)	**Male**	**Female**	**Mean length (SD)**	**Male**	**Female**
Birth	48.47 (±1.82)	48.83 (±1.77)	47.88 (±1.73)	-	-	-
6 weeks	54.37 (±2.07)	54.82 (±2.08)	53.63 (±1.84)	54.12 (±2.29)	54.58 (±2.60)	53.60 (±1.75)
10 weeks	57.94 (±2.49)	58.45 (±2.44)	57.09 (±2.35)	57.64 (±2.38)	58.08 (±2.63)	57.14 (±1.94)
14 weeks	60.67 (±2.37)	61.24 (±2.34)	59.75 (±2.12)	60.52 (±2.36)	61.08 (±2.53)	59.88 (±1.97)
26 weeks	65.06 (±2.51)	65.55 (±2.51)	64.24 (±2.30)	65.13 (±2.55)	65.75 (±2.62)	64.43 (±2.27)
Age	**EBF**			**Non-EBF**		
	Mean head circumference (SD)	**Male**	**Female**	**Mean head circumference (SD)**	**Male**	**Female**
Birth	33.77 (±1.26)	33.8 (±1.26)	33.5 (±1.06)	-	-	-
6 weeks	37.45 (±2.63)	37.6 (±3.21)	37.0 (±1.04)	37.36 (±3.05)	37.3 (±4.16)	37.3 (±0.99)
10 weeks	39.11 (±1.28)	39.5 (±1.19)	38.4 (±1.10)	39.00 (±1.14)	39.3 (±1.15)	38.6 (±0.99)
14 weeks	40.42 (±1.32)	40.8 (±1.20)	39.7 (±1.21)	40.32 (±1.07)	40.6 (±1.10)	40.0 (±0.92)
26 weeks	42.35 (±1.24)	42.7 (±1.10)	41.8 (±1.09)	42.24 (±1.24)	42.6 (±1.25)	41.8 (±1.09)

EBF: Exclusive breastfeeding

Table 2: Mean weight, length, and head circumference gains during each visit interval in EBF and non-EBF infants

Age	Weight gain in grams					
	EBF			Non-EBF		
	Mean weight gain (±SD)	Male	Female	Mean weight (±SD)	Male	Female
0–6 weeks	1492.61 (±464.28)	1590.83 (±446.43)	1329.7 (±449.85)	1389.83 (±494.93)	1482.56 (±526.69)	1286.33 (±435.16)
6–10 weeks	914.76 (±298.83)	979.38 (±293.44)	807.59 (±277.70)	912.71 (±311.22)	935.20 (±313.73)	887.38 (±307.81)
10–14 weeks	750.23 (±285.08)	780.15 (±292.05)	701.25 (±267.90)	783.76 (±320.12)	806.40 (±343.07)	757.79 (±291.00)
14–26 weeks	1136.01 (±468.97)	1143.51 (±452.53)	1123.75 (±497.39)	1127.48 (±911.13)	1203.20 (±498.69)	1041.45 (±218.69)
Age	**Length gain in centimeters**					
	EBF			Non-EBF		
	Mean length (±SD)	Male	Female	Mean length (±SD)	Male	Female
0–6 weeks	5.91 (±1.76)	5.99 (±1.81)	5.78 (±1.69)	5.95 (±1.93)	6.20 (±2.21)	5.67 (±1.51)
6–10 weeks	3.54 (±1.62)	3.63 (±1.61)	3.39 (±1.63)	3.52 (±1.59)	3.50 (±1.72)	3.55 (±1.45)
10–14 weeks	2.75 (±1.50)	2.81 (±1.50)	2.66 (±1.49)	2.91 (±1.46)	3.04 (±1.53)	2.78 (±1.36)
14–26 weeks	4.38 (±1.85)	4.32 (±1.75)	4.48 (±2.01)	4.59 (±1.82)	4.64 (±1.93)	4.54 (±1.69)
Age	**Head circumference gain in grams**					
	EBF			Non-EBF		
	Mean head circumference (±SD)	Male	Female	Mean head circumference (±SD)	Male	Female
0–6 weeks	3.74 (±1.30)	3.81 (±1.30)	3.64 (±1.32)	3.18 (±1.35)	2.91 (±1.83)	3.49 (±1.33)
6–10 weeks	1.67 (±0.53)	1.88 (±0.15)	1.31 (±0.55)	1.66 (±0.88)	1.96 (±0.97)	1.33 (±0.44)
10–14 weeks	1.29 (±0.51)	1.30 (±0.50)	1.29 (±0.54)	1.34 (±0.55)	1.32 (±0.60)	1.37 (±0.51)
14–26 weeks	1.93 (±0.74)	1.94 (±0.60)	1.91 (±0.73)	1.85 (±0.77)	1.95 (±0.80)	1.73 (±0.72)

EBF: Exclusive breastfeeding

Second-born infants had significantly higher growth indices than firstborns. Also, the weight of non-EBF infants was significantly less compared to that of those given EBF.

In our study, the mean duration of EBF was 22.13 weeks, similar to a previous study done on infants of health care personnel by Renitha et al., (5.3 months), but different from another study in urban settlements by Reddy et al., (76.9 days); the latter two studies from the same region/state as our study.[16,17] For reference, the median duration of EBF and predominant breastfeeding is 2.9 months and 5.8 months, respectively, in India (NFHS 4 data).[18] The trajectory of the number of EBF infants in our study initially showed a relative sustenance until 14 weeks (100 to 87.1%), followed by a precipitous decline to 47% at 26 weeks. This is markedly different from the NFHS-4 and NFHS-5 data trajectory from 73.2% to 31.3% (NFHS 4) and 75.6–43% (NFHS-5) and the Reddy et al study, both showing steady declines.[3,17]

Racial, cultural, socioeconomic factors and family structure significantly influence infant feeding practices and in-turn EBF rates.[19] Majority of infants in our study (60%) were firstborn, born by a normal vaginal delivery (65.8%), and born into a joint family (68%). 78.7% of mothers had a college education while only 21.3% were working women. These sociodemographic characteristics are quite different from those of the NFHS and other study sample cohorts. Our study cohort is most likely representative of the evolving socioeconomic transition in an aspirational Indian urban middle class, hence reinforcing the need to plan not only targeted region-specific but also timely social strata-specific approaches for promoting and scaling up EBF for the recommended first 6 months of life.

Monitoring growth during infancy plays an important role in predicting a child's future health. BF infants tend to self-regulate their energy intake and have a lower metabolic rate than FF infants. The slower weight gain among EBF infants has been attributed to greater accumulation of lean mass, rather than fat mass.[20,21] Surprisingly, and contrary to these expectations, more recent western studies including a systematic review have found lower fat-free mass and greater body fat percent among EBF versus FF, with some studies observing lower weight and Body Mass Index (BMI) trajectories among EBF compared with FF infants; differences persisting after controlling for confounding variables.[21] Postulated reasons include lower protein content of breastmilk and higher circulatory Leptin levels in EBF infants.[22,23] Yet other recent studies have found no difference in fat mass or in the overall trajectory of adiposity between FF and BF infants, thereby concluding that there is little

Table 3: Generalized estimating equation analysis for weight, length, and head circumference among the study population

Predictors	Weight			Length			Head circumference		
	Estimate (b)	95% CI	P-value	Estimate (b)	95% CI	P-value	Estimate (b)	95% CI	P-value
Age of mothers	−9.57	(−22.08, 2.92)	0.13	−0.002	(−0.045, 0.042)	0.94	−0.005	(−0.04, 0.034)	0.78
Gender of baby									
Male	1.00			1.00			1.00		
Female	−392.16	(−488.13, −296.18)	**<0.001***	−1.10	(−1.43, −0.78)	**<0.001***	−0.74	(−1.01, −0.47)	**<0.001***
Order of baby									
First	1.00			1.00			1.00		
Second	203.19	(97.25, 309.13)	**<0.001***	0.41	(0.05, 0.77)	**0.02***	0.38	(0.07, 0.69)	**0.02***
Third	201.67	(−15.05, 418.37)	0.07	0.75	(0.006, 1.49)	0.048	0.06	(−0.44, 0.56)	0.81
Mother's education									
College	1.00			1.00			1.00		
Elementary/Higher secondary	18.16	(−94.64, 131.01)	0.75	−0.17	(−0.57, 0.23)	0.41	0.10	(−0.18, 0.39)	0.47
EBF									
Yes	1.00			1.00			1.00		
No	−119.47	(−217.48, −21.47)	**0.02***	−0.13	(−47.48, 0.21)	0.44	0.01	(−0.26, 0.28)	0.93

Bold value with * denotes that P value is statistically significant, EBF: Exclusive breastfeeding

association of infant feeding mode with adiposity gains during early infancy.[24]

It is in this context that our study has evaluated the potential independent influence of EBF in comparison to non-EBF (including predominant and complementary breastfeeding infants) on anthropometric parameters. This grouping is the most relevant scenario in our setting, since among non-EBF infants, cow's milk is being increasingly, but not fully, replaced by formula milk due to changing socioeconomic status and family structure, as gleaned from practical insights. Moreover, although several studies have compared differential gains in anthropometric indices with breastfeeding patterns,[20,25-27] only a few prospective studies have applied logistic regression models to factor in the impact of potential confounders on growth parameters and patterns.

In the study by Moradi et al., on 250 Iranian infants, longitudinal data of infant growth as a dependent variable and type of nutrition as an independent variable using multivariate t-linear mixed model found that EBF infants were heavier (P<0.001), taller (P=0.0002) and had greater HC (P=0.002) than infants receiving formula.[6] In the study in 205 Malawian infants by Kuchenbecker et al., analysis after adjustment for several covariates (including infant age, mother's anthropometry, education, health professional advice) found EBF infants significantly heavier, taller, and less likely stunted than non-EBF infants, with equally high effect at the different length centiles tested in quantile regression.[28] In a study done by Bell et al., on 276 infants in the US, weight and BMI z scores of FF infants increased due to increase in lean mass, not fat mass compared to BF, with no difference in linear growth between the groups; after adjusting in linear regression for sex, gestational age, ethnicity, maternal BMI, study site, and socioeconomic status.[24]

The primary GEE model with robust standard error estimation is a well-accepted model to evaluate the impact of time dependent (infant age, EBF) as well as time invariant (gender, birth order, mother's age, and education) influencing factors on anthropometric gains.[29] In the study by Lahiri and Chakraborty, of the 42 infants recruited from villages under two sub-centers in a community development block in West Bengal, whose weights were followed up for 6 months at monthly intervals, the GEE showed that infant age, birth weight and diarrheal episodes were statistically significant in directly affecting weight gain in both sexes, but EBF attained statistical significance among male infants only (Male infants-193 g; P<0.001 vs. Female infants-12 g; P=0.841). This study also found higher weights for male infants at all time points, but higher weight gains/velocities only at certain time periods, when compared to female infants.[30] In comparison, though our study population had steady

increments in all three anthropometric measurements across the period, female infants had statistically significant lower weight, length, and HC (each P<0.001) compared to male infants. Firstborns had significantly lower growth indices than second-born infants (P≤0.02), probably attributable to maternal-infant bonding differences. Non-EBF infants' weight was significantly 119 g (P=0.02) less than EBF infants. Reassuringly, our study confirms the results of previous studies on the independent positive impact of EBF on anthropometric indices in the first 6 months of life.

Strengths and limitations of the study

Important strengths of our study include conduct in a tertiary-care hospital setting with well-trained staff and standardized calibrated equipment for all three anthropometric parameters- weight, length and HC; as well as its prospective design. Furthermore, the study sample size, calculated based on EBF prevalence, was about 10 times the minimum requirement for anthropometric analysis, considering 5 time points of assessment for each parameter.[30] Although not generalizable across regions, the GEE analysis results have been derived by factoring in the possible influence of several potential confounders for each of the anthropometric parameters in our setting.

CONCLUSION

Given that sex and birth order are nonmodifiable factors, this study provides important evidence that, among the factors affecting growth in early infancy, EBF-a modifiable factor, independently influences infant anthropometric parameters positively. The findings of this study add to previously published work by the authors, from the same study cohort, on illness incidences being significantly higher in non-EBF children.[31] Taken together, EBF, significantly and independently, promotes infant growth while reducing illness incidences.

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