RESEARCH PAPER

Correlates of Breastfeeding in Villages and Tea-Gardens in Assam, India

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Objective: To observe and compare breastfeeding practices in villages and tea-gardens. **Methods**: Analytical cross-sectional study among mothers of infants in a health and demographic surveillance site in Dibrugarh, Assam. **Results**: 1435 mothers (855 from tea-gardens, 580 from villages); and 1437 infants (857 from tea-gardens, 580 from villages), were included in study. Mean maternal age was 25.1 (4.4) years in tea-gardens and 25.8 (4.9) years in villages. Timely initiation of breastfeeding was higher in villages (82.6%) than tea-gardens (76.4%). Feeding colostrum was higher in villages (71.2%) than tea-gardens (60.8%). **Discussion**: Factors affecting breastfeeding were different in villages and tea-gardens. Timely initiation of breastfeeding was associated with nuclear family in villages and joint family in tea-gardens. Hence, interventions promoting breastfeeding practices should be tailored instead of one-size-fits-all approach.

Keywords: *Assam, Health and Demographic Surveillance System (Dibrugarh-HDSS).*

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Globally, only about 40% of infants below 6 months are exclusively breastfed [1], and there is a low awareness of optimal breastfeeding-practices [2]. There is evidence suggesting endorsement of early initiation of breast feeding as a cost-effective intervention, which would reduce 1.45 million deaths translating to 22% neonatal deaths in developing countries [3]. Infant mortality rate (IMR) in Assam was found to be 48/1000 live births with a huge rural-urban disparity (20 in urban vs 58 in rural) [4].

In India, the breastfeeding practices are influenced by the traditions, customs, rituals and taboos [5]. Tea-garden community, socio-culturally different from the native village population, is a distinct community in Assam constituting 18% of total population. Studies on practice and determinants of breastfeeding, which is expected to be different in different communities would be of immense importance to acknowledge and address the barriers that may exist. This study was undertaken to observe and compare the breastfeeding practices among mothers of infants in villages and tea-gardens of Dibrugarh district of Assam.

METHODS

This was a cross-sectional study based on the data collected during a baseline survey for establishment of a Health and Demographic Surveillance System in Dibrugarh district (Dibrugarh-HDSS) of Assam by Indian Council of Medical Research, Regional Medical Research Centre, North-Eastern region (ICMR-RMRC NE). Dibrugarh-HDSS covers 60 villages and 20 tea-gardens with a total of 1,06,769 individuals (22,536 households). For this communication, all mothers living in the study area with children under one year of age were included; 1437 infants born to 1435 mothers during March, 2019-February, 2020 were recorded in Dibrugarh-HDSS. Mothers of infants providing informed consent were included.

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Data were collected using a structured, interviewer-administered, app-based questionnaire in a unique geo-tagging- enabled mobile application in tablets provided to the trained surveyors. The questionnaire was first translated to Assamese language and then retranslated to English, to maintain consistency of questions.

The breastfeeding practice variables (time of initiation, colostrum and pre-lacteal feeding) and history of delivery were obtained from the mothers. All the documents pertaining to the history of childbirth were examined. The family information was obtained from the head of the family or the key informant.

Statistical analysis: Data collected through mobile tablets were stored in ICMR-RMRC server, which was then

extracted in Excel-format and further exported to SPSS (ver. 26.0, IBM) for analysis. For descriptive statistics, frequencies and cross-tabulations were generated. Bivariate regression analysis was done to find the risk-factors associated with the dependent-variables and Odds Ratio(OR) with 95% confidence-intervals were obtained. Significance was considered when $P \leq 0.05$.

RESULTS

We report 1435 mothers (580 in villages and 855 in tea-gardens) with 1437 infants (580 in villages and 857 in tea-gardens) in the study area. The mean maternal age was found to be 25.4 (4.7) years [25.1 (4.4) years in tea-gardens vs. 25.8 (4.9) years in villages]. **Table I** represents the socio-demographic characteristics of the mothers.

Most of the deliveries were institutional and attended by doctors in both the groups. There were more non-institutional deliveries in tea-gardens as compared to the villages (3.9% vs 0.9%). Almost similar proportion of women in both communities had adequate antenatal checkups. There were significantly higher number of assisted births or Caesarean sections in women from the villages than tea-gardens (21.9% vs 10%). The incidence of low birth weight was also found to be higher among tea-garden than village community (34.3% vs 24.5%). **Table II** demonstrates that a significantly higher proportion of infants had delayed initiation of breastfeeding and did not receive colostrum in tea-gardens (23.6%) than villages (17.4%).

Table I Socio-demographic Characteristics of the Study Participants

Characteristics	*Village (n=580)*	*Tea garden (n= 855)*
Age of mother (y) [a]		
≤ 20	52 (9.0)	59 (6.9)
21-30	416 (71.7)	689 (80.6)
31- 40	105 (18.1)	102 (11.9)
> 40	7 (1.2)	5 (0.6)
Religion[a]		
Hindu	543 (93.6)	820 (95.9)
Muslim	32 (5.5)	20 (2.3)
Others	5 (0.9)	15 (1.8)
Nuclear family[b]	472 (81.4)	587 (68.7)
Educational status of mother[b]		
Illiterate	56 (9.7)	308 (36.0)
Upto primary	121 (20.9)	212 (24.8)
High school and above	403 (69.4)	335 (39.2)
Maternal occupation[b]		
Working mother	1 (0.2)	151 (17.7)
Homemaker	579 (99.8)	704 (82.3)
Institutional delivery[c]	575 (99.1)	824 (96.1)
Delivery attended by[b]		
Doctor	366 (63.2)	379 (44.2)
General nurse midwife	64 (11.0)	187 (21.8)
Auxilary nurse midwife	108 (18.6)	240 (28.0)
Birth order[c] *(n=1437)*		
First	299 (51.5)	395 (46.1)
Second	222 (38.3)	313 (36.5)
Male sex	306 (52.8)	440 (51.3)
Full term delivery[d]	556 (95.9)	839 (97.9)
Normal delivery[b]	453 (78.1)	771 (90.0)
Low birthweight[b]	142 (24.5)	294 (34.3)

Values in no. (%). [a]P<0.01, [b]P<0.001, [c]P=0.001,[d]P<0.05.

Fig. 1 shows the OR of different variables on timely initiation of breastfeeding and colostrum feeding. Overall, time of initiation of breastfeeding was found to be associated with maternal education, occupation and delivery being conducted by a doctor. In villages, belonging to joint family and delivering a mature newborn were associated with timely initiation (**Web Table I**). Whereas, in tea-gardens, being a homemaker and belonging to a nuclear family were associated with timely initiation of breastfeeding.

DISCUSSION

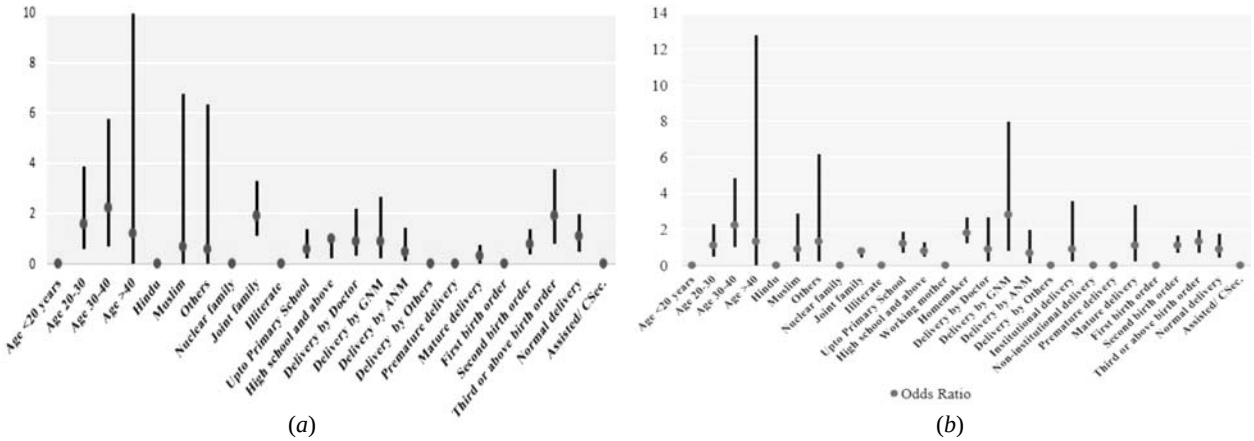
Of the 1435 mothers with 1437 infants surveyed, the proportion of institutional deliveries was low in tea-gardens. The lack of health awareness and education may be considered as factors for low rate of institutional deliveries, which also indicates poor utilization of health services [6,7]. However, this is far better than the state average in both groups [8]. There were a small proportion of births attended by non-medical staff in both groups of women (7.2% in villages vs 6% in tea-gardens). There were significantly higher numbers of cesarian sections in villages as compared to tea-gardens. This might be attributed to poor awareness and utilization of services among the tea-garden community [6].

Timely initiation was significantly poorer in mothers from tea-gardens as compared to their village counterparts (76.5% vs 82.6%). Both these figures are; however, better

Table II Breastfeeding Practices Among the Study Participants

Characteristics	*Village (n=580)*	*Tea garden (n=855)*
Breastfeeding initiated[a]		
Within 1 h	479 (82.6)	655 (76.5)
1-24 h	71 (12.2)	170 (19.8)
>24 h	30 (5.2)	32 (3.7)
Pre-lacteal feed given	3 (0.5)	1 (0.1)
Colostrum given[a]	413 (71.2)	521 (60.8)

Values in no. (%).[a]P<0.001.



(*a*) (*b*)

Fig. 1 Distribution of different factors determining timely initiation of breastfeeding in villages (1*a*) and in tea-gardens (1*b*).

than that made by other studies in Assam [5,9]. Many women did not know that they can breastfeed immediately after childbirth [10]. This might be the reason behind some children having delayed initiation of breastfeeding. Mothers, whose delivery was attended by trained medical staff had more odds of initiating breastfeeding timely. In our study, initiation of breastfeeding was independent of maternal education or occupation, in contrast to findings of Gupta, et al. [10].

We found encouraging figures for the proportion of infants fed on pre-lacteals. Only 4 (0.3%) infants were given pre-lacteals. These figures are better than other studies done in Dibrugarh [11,12]. About three-quarters of the mothers fed colostrum to their newborns. (60.8% in tea-gardens vs 71.2% in villages). This is, however, lower than that found by other studies done in this area (86-91.8%) [11,12]. This focusses on the need to explore factors responsible for lower rates of giving colostrum like poor knowledge, common beliefs/myths regarding colostrum, etc. among study communities.

Other studies conducted in this research area have had almost similar findings related to colostrum feeding of babies [9,12-14]. Similar to previous authors [14] we found that the breastfeeding practices were better in homemakers than working mothers [14]. However, the specific impact of these factors in our study needs further exploration. This contrasting findings related to practices in joint families may be attributed to various socio-cultural factors like family structure, values, beliefs, etc. to explore which, further research is warranted. We found that the educational status of mother did not influence the initiation of breastfeeding differing from that found that higher educational achievement influences breastfeeding practices [15]. Complex relationships between education, occupation and breastfeeding practices need to be studied.

The major limitation of this study is the varying recall periods of mother, which may lead to bias. We can conclude that the breastfeeding practices are comparatively better in the villages than tea-gardens which implies that breastfeeding promotion activities in tea-gardens need to be intensified. The study commu-nities had different set of factors determining the breast-feeding practices and thus, it is implied that interventions to promote breastfeeding practices should be tailored to the needs of each population. The institutional deliveries in tea-gardens are comparatively lesser than that in villages. Efforts to promote optimal breastfeeding practices should, in addition to increasing institutional deliveries, focus on the identification of factors that influence the practice and how they can be addressed in a participatory manner. The findings of our study will be useful to plan intervention strategies in the communities for improvement of breast-feeding practices.

Ethics clearance: Institutional Ethics Committee (Human) of Regional Medical Research Centre, North Eastern Region; No. RMRC/Dib/IEC(Human)/2017-18/3710 dated March 20, 2018.
Contributors: RR,PKB: conceptualized the study and finalized the study design; PKB,KB, PC,NB: carried out data collection and analysis was done by PKB, KB, JP and MD. All the authors contributed in data interpretation, draft preparation and review of draft. All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.
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Note: Additional material related to this study is available with the online version at *www.indianpediatrics.net*

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WHAT THIS STUDY ADDS?

- The determinants of breastfeeding are different for specific communities in Assam; hence, intervention to improve breastfeeding practices should be tailored to the community rather than a unitary approach.

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Web Table I Results of Binary Logistic Regression Analysis of the Factors Associated with Giving Colostrum to the Infant

Independent variables	*Adjusted Odds Ratio (CI)**		
	Overall	*Village*	*Tea garden*
Maternal age (y)			
20-30	1.1 (0.3-3.6)	2.6 (0.3-21.9)	0.2 (0.02-2.5)
30-40	1.1 (0.3-3.8)	3.0 (0.3-26.2)	0.2 (0.02-2.5)
>40	1.1 (0.2-6.2)	1.8 (0.1-28.6)	0.5 (0.03-10.3)
Religion			
Muslim	2.0 (1.1-3.6)	3.1 (1.5-6.5)	1.2 (0.5-3.0)
Others	0.8 (0.3-2.1)	1.8 (0.3-11.1)	0.6 (0.2-1.9)
Joint family	0.5 (0.4-0.7)	0.99 (0.6-1.6)	0.4 (0.3-0.5)
Maternal education			
Up to primary school	0.9 (0.6-1.2)	0.7 (0.3-1.3)	1.1 (0.8-1.6)
High school and above	0.6 (0.5-0.8)	0.6 (0.4-1.2)	0.8 (0.6-1.1)
Mother - homemaker[a]	1.3 (1.03-1.7)	-	1.8 (1.4-2.4)
Trained birth attendant			
Doctor	0.3 (0.2-0.5)	0.4 (0.2-0.8)	0.1 (0.05-0.3)
GNM	0.6 (0.3-1.1)	0.6 (0.3-1.4)	0.3 (0.1-0.8)
ANM	0.7 (0.4-1.2)	0.7 (0.3-1.5)	0.4 (0.1-1.0)
Institutional birth[a]	3.3 (1.4-7.7)	-	5.3 (1.7-16.7)
Preterm delivery	0.7 (0.4-1.3)	0.4 (0.2-0.9)	1.0 (0.4-2.9)
Birth order			
Second	0.9 (0.7-1.2)	0.9 (0.6-1.4)	0.9 (0.7-1.3)
Third or above	1.2 (0.8-1.7)	1.8 (0.9-3.2)	0.9 (0.6-1.5)
Normal delivery	1.4 (0.9-1.9)	1.5 (0.9-2.5)	0.9 (0.6-1.6)

[a]The numbers of mothers in villages who are employed and also that of women having non-institutional deliveries are negligible and hence the OR could not be obtained for these variables in villages.