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Original Article

Neonatology Section

Assessment of Knowledge and Practices of Mothers about Infant Feeding: A Hospital Based Study

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ABSTRACT

Introduction: Exclusive Breast Feeding (EBF) is one of the most efficacious and cost effective intervention for reduction of child morbidity and mortality. Institutional delivery with maternal counselling and training is accepted as an effective modality to implement EBF. However, EBF rates have remained unacceptable despite high proportion of institutional deliveries in India.

Aim: To estimate EBF rate amongst institutional deliveries, and the factors affecting breastfeeding practices among these mothers.

Materials and Methods: This was a cross-sectional hospital based study. Institutionally, delivered infants attending Paediatrics Out-Patient Department (OPD) and immunisation clinic, who had received complete vaccination till 14 weeks, were included. All mother-baby pairs satisfying inclusion criteria were recruited after written informed consent. Institutional ethics committee approved the study. Infant and Young Child Feeding (IYCF) guidelines and Integrated Management of Neonate and Child Illness (IMNCI) Feeding Assessment Questionnaire based proforma was used to access breastfeeding knowledge and practices amongst recruited subjects. Chi-square test was used to assess the relationship between background characteristics of subjects and feeding practices. Further these associations were tested using multiple logistic regression models with each associated factor.

Results: A total of 500 mother and baby dyad were recruited. Only 64 (12.8%) mothers initiated breastfeeding within 1 hour of birth; 12.6% babies never received breastfeeding. A 17.6% discarded colostrum considering it bad or indigestible for their babies. Prelacteal feeding in first six months of birth was practiced by 47.6% mothers. Scheduled and on-demand breastfeeding was higher amongst mothers living in nuclear families as compared to those in joint families (90.4% vs. 80.7%; p=0.003).

Conclusion: Inspite of institutional delivery and multiple contacts with health personnel, EBF rate is still low. Many faulty practices, like withholding colostrum and prelacteal feeding are still prevailing in the society. Effective and repeated counselling is required in each contact with care givers for successful EBF.

Keywords: Counselling, Exclusive breast feeding, Sociodemographic factors

INTRODUCTION

India accounts for 24% of global under-five child deaths [1]. Suboptimal neonatal care, malnutrition faulty feeding and immunisation practice along with high burden of communicable diseases are important causes of this poor state of infant and child health [2]. EBF is one of the most effective and preventive health measures for child morbidity and mortality [3], and has been estimated to prevent 13-16% of all childhood deaths in India. Another 6% deaths can be prevented by adequate complementary feeding between the age of 6 and 24 months [4]. EBF is associated with higher intelligence [5] and significantly lower relative risk of mortality due to pneumonia and diarrheal illnesses [6]. As compared to partially or non-breast fed babies. In institutional deliveries, during postnatal stay mothers are counselled by health professionals about breastfeeding, problems associated during feeding and their management [7].

Most of mothers who delivered in institution with Baby Friendly Hospital Initiative (BFHI) settings have adequate knowledge about feeding and weaning but their practices are different from their knowledge [8]. Significant increase in rates of initiation of breastfeeding in first hour and EBF rates was seen after breastfeeding counselling [9]. Good knowledge of breastfeeding practices and its advantages is seen in women attending ANC/vaccination clinics [10,11]. Thus, institutional delivery is thought to be the solution for better maternal knowledge and child rearing practices including breastfeeding. However, latest National Family Health Survey Data (NFHS-4) reports low rates of early breastfeeding initiation (<30%), EBF (49.4%) and adequate complementary feeding rates (4.3%-9.4%) despite high proportion of (84.4%) institutional deliveries in Delhi [12].

The national survey data states that there is early introduction of liquids and solid or semi-solid foods before the recommended age of six months hindering with the practice of EBF and about 30% of children start receiving Complementary Food (CF) at the age of 4-5 months. Delayed CF is also common practice [13].

It is needed to study the knowledge and factors affecting the practices of these mothers who were antenatally booked had institutional delivery and visited health facility for vaccination and are presumed to be well counselled and motivated to follow correct feeding practices so that appropriate steps can be taken to intervene. Therefore, this study was designed to assess knowledge, attitude and practices of mothers regarding infant feeding practices (breast feeding and initiation of complementary feeding) who were booked, had institutional delivery and at least had three immunisation visits.

Various studies have reported positive impact of counselling during antenatal check-ups and postnatal stay after an institutional delivery on breastfeeding practices [9-11]. During visits for vaccination or follow-up, counselling for correct feeding practices and to resolve problems related to it is provided by the health care personnel. Institutional delivery has markedly increased over a period of time >84% (NFHS-4) but rates of early initiation of breastfeeding (41%) and EBF rates still remains low and unacceptable. According to NFHS-4, 10% of infants receive complementary feeding before six months and only 42% of infants get complementary feeds at 6-8 months. Only 9.6% children follow minimal acceptable diet [14].

MATERIALS AND METHODS

This descriptive cross-sectional study was carried out in the Paediatrics department, of a tertiary care hospital, over period of

1.5 years after taking ethical clearance from the institutional ethical committee (letter no. IEC/VMMC/SJH/thesis/104). The mothers of these children were all booked in the hospital and all the subjects had institutional delivery and had received vaccination at 6,10 and 14 weeks in the hospital were included in this study considering mothers had multiple contacts with healthcare provider and had been counselled multiple times about breastfeeding/feeding practices by that time.

Mother baby pairs were recruited from immunisation clinic/OPD from 14 weeks up to 12 months of age. Babies with low birth weight, with specific feeding problems, Cleft lip/palate, congenital defects, chronic illness were excluded from the study.

Interview was conducted after taking informed consent using a questionnaire to obtain information regarding their age, parity, level of education, and socioeconomic condition. To assess the socioeconomic status, we used Modified Kuppuswamy scale [15]. Feeding assessment questions based on IMNCI feeding assessment chart were used in the questionnaire to assess the knowledge and breastfeeding practices among the subjects. This tool contains the WHO recommended questions to assess the feeding practices of young infant [5].

As per available medical record statistics, average 150-250 potential subjects visit the hospital every month; taking this assumption, α of 0.05 and power of study 80%, a sample size of 500 subjects (mother baby pairs) was calculated. Subjects were interviewed as per predesigned proforma regarding knowledge and practices of breastfeeding. Growth parameters (anthropometry- weight, height, head circumference) were recorded for each baby.

STATISTICAL ANALYSIS

Data was analysed using SPSS for Windows (SPSS Inc., Chicago, IL). The $p<0.05$ was taken as statistically significant. For each significant predictor, Odd's ratio and its 95% confidence interval was calculated. Chi-square test was used to assess the relationship between background characteristics of mothers and children and breastfeeding practices. Further these associations were tested using logistic regression models. For binary outcomes simple logistics regression models as bivariate analysis that is when each independent variable was associated with outcome independently. Also, multiple logistic regression models were used to test the net effect of each variable on the outcomes. For categorical outcomes which have more than two values, multinomial logistics regression models were used.

RESULTS

[Table/Fig-1] depicts the baseline characteristics. Out of 500 babies, majority {213 (42.6%)} were less than 6 months of age; 46.4% were male babies; 31.6% mothers were illiterate; majority of families belonged to lower middle class strata.

In this study EBF rate was 30%. Higher percentage of EBF was seen when parents were decision maker regarding feeding practices. Illiterate mothers and those with lower educational qualification tend to follow EBF in higher percentage. Inspite of institutional deliveries, 12.6% babies never received breast milk and only 64 (12.8%) initiated breastfeeding within 1 hour of birth. 82.4% mothers gave colostrum to their babies and 17.6% did not feed colostrum and discarded it considering it as bad milk or indigestible for babies. A 47.6% gave either prelacteal feed or gave food other than breast milk during first six months of birth. A 35.3% were advised by medical professionals like nursing staff, doctor. An 87(36.6%) were advised by grandmothers of families, 21 (8.8%) were advised by relatives, 16 (6.7%) by neighbours and 30 (12.6%) mothers were self-motivated to give top feeds [Table/Fig-2].

Parameters		No. of babies (n), (%)
Age of babies	<6 months	213 (42.6%)
	6-9 months	146 (29.2%)
	>9 months	141 (28.2%)
Sex	Male	232 (46.4%)
	Female	268 (53.6%)
Birth order	1st	255 (51%)
	2nd	171 (34.2%)
	3rd	65 (13%)
	4th and above	9 (1.8%)
Education	Illiterate	158 (31.6%)
	Primary	153 (30.6%)
	Secondary	124 (24.8%)
	Higher and above	65 (13%)
Socio-economic status (Modified. Kuppuswamy scale)	Lower class	50 (10%)
	Lower middle class	239 (47.8%)
	Upper middle class	161 (32.2%)
	Upper class	50 (10%)
Type of family	Joint	156 31.2%)
	Nuclear	344 (68.8%)
Decision maker	Father	137 (27.4%)
	Mother	256 (51.2%)
	Grand parents	107 (21.4%)
Mode of delivery	Vaginal	414 (82.8%)
	Caesarean section	86 (17.2%)

[Table/Fig-1]: Baseline characteristics of subjects.

Significantly, mothers living in nuclear families, breast feed their babies more frequently on schedule basis as compared to mothers living in a joint family (90.1% vs 80.8%; p=0.003). Ghutti was the most common prelacteal feed used. As other food, mothers of higher socioeconomic status used formula feed during first 6 months higher percentage and use of top milk was seen more in lower and upper lower economic strata.

In the practice of feeding colostrum, type of family (nuclear vs joint) and decision maker in family regarding infant feeding practices came out to be significant factors. It was seen that, in families with grandmothers as deciding persons, 35.5% of such mothers discarded colostrum considering it as indigestible. Practice of giving top feeds (animal milk) was seen in babies with higher birth order. Decision maker regarding feeding practices for baby and type of family (nuclear vs joint) stands out as a significant factor (p-value <0.001) for EBF and practice of giving colostrum. Majority mothers initiated complementary feeding after six months of age [Table/Fig-3].

Total 238 (47.6%) babies received any other food during 1st 6 months.

DISCUSSION

This study looked at the impact of decision maker/household head on infant feeding practices. Decision maker in family regarding rearing practices was found to be a significant factor (p-value 0.002) and 22.4% babies with grandparents, as decision makers did not receive breast milk. A 12.6% babies, who were started on top feeds since birth, reason given was that mother never had adequate lactation after birth.

EBF is a strongest predictor of infant survival particularly in a developing country [16]. The EBF rate in this study was only

			Total	Decision maker			Socioeconomic status				Mothers education				Type of family	
				Fa	Mo	GP	L	LM	UM	U	I	P	S	HS	Joint	Nuclear
Breast feed	Yes	N (%)	437	122 (89.1)	232 (90.6)	83 (77.6)	43 (86)	203 (84.9)	144 (89.4)	47 (94)	132 (83.5)	135 (88.2)	111 (89.5)	59 (90.8)	126 (80.7)	311 (90.4)
	p			0.002			0.262				0.333				0.003	
Initiation of breast feeding	<1 hr	N (%)	64 (12.8%)	19 (13.9)	32 (12.5)	13 (12.1)	5 (10.0)	24 (10.0)	26 (16.1)	9 (18.0)	16 (10.1)	20 (13.1)	19 (15.3)	9 (13.8)	21 (13.5)	43 (12.5)
	1-24 hr	N (%)	318 (63.6)	93 (67.9)	154 (60.2)	71 (66.4)	29 (58.0)	156 (65.3)	99 (61.5)	34 (68.0)	100 (63.3)	104 (68.0)	78 (62.9)	36 (55.4)	96 (61.5)	222 (64.5)
	>24 hr	N (%)	118 (23.3)	25 (18.2)	70 (27.3)	23 (21.5)	16 (32.0)	59 (24.7)	36 (22.4)	7 (14.0)	42 (26.6)	29 (19.0)	27 (21.8)	20 (30.8)	39 (25)	79 (23)
	p			0.336			0.205				0.389				0.812	
Practice of giving colostrum	No	N (%)	88 (17.6%)	23 (16.8)	27 (10.5)	38 (35.5)	10 (20.0)	47 (19.7)	20 (12.4)	11 (22.0)	36 (22.8)	25 (16.3)	17 (13.7)	10 (15.4)	44 (28.2)	44 (12.8)
	p			<0.001			0.208				0.389				<0.001	
Exclusive breast feeding	Yes	N (%)	150 (30%)	40 (26.6)	90 (60)	20 (13.3)	19 (12.6)	75 (50)	43 (28.6)	13 (8.6)	46 (30.6)	54 (36)	39 (26)	11(7.3)	39 (25)	111 (32.3)
	p			0.007			0.399				0.057				0.100	
Duration of breast feeding	<6 mo	N (%)	330 (66%)	93 (67.9)	162 (63.3)	75 (70.1)	29 (58.0)	156 (65.3)	110 (68.3)	35 (70.0)	108 (68.4)	93 (60.8)	78 (62.9)	51 (78.5)	103 (66)	227 (66)
	p			0.395			0.527				0.064				0.993	

[Table/Fig-2]: Breast-feeding practices among the mothers.
mo: months. Fa: Father; Mo: Mother; GP: Grandparents; L: Lower class; LM: Lower middle class; UM: Upper middle class; U: Upper class; I: Illiterate; P: Primary; S: Secondary; HS: Higher secondary; Hr: Hours

		N (%)	Decision maker			Socioeconomic status				Mothers education				Family
			Fa	Mo	GP	L	LM	UM	U	I	P	S	HS	Nuclear (n, %)
Daily frequency of breast feeding (n=500)	<4	44 (8.8)	9 (6.5)	13 (5.1)	22 (20.5)	3 (6.0)	24 (10.0)	15 (9.3)	2 (4.0)	19 (12.0)	9 (5.9)	11 (8.9)	5 (7.7)	19 (5.5)
	4-6	49 (9.8)	21 (15.3)	16 (6.2)	12 (11.2)	5 (10.0)	25 (10.4)	15 (9.3)	4 (8.0)	9 (5.7)	18 (11.7)	14 (11.3)	8 (12.3)	32 (9.3)
	>6	407 (81.4)	107 (78.2)	227 (88.6)	73 (68.2)	42 (84.0)	190 (79.5)	131 (81.3)	44 (88.0)	130 (82.2)	126 (82.3)	99 (79.8)	52 (80.0)	293 (85.1)
	p		<0.001			0.815				0.274				<0.001
Type of prelacteal or other food <6 months (n=238)	Gh	36 (15.1)	15 (25.0)	11 (10.9)	10 (13.0)	6 (23.1)	18 (16.8)	11 (14.5)	1 (3.4)	11 (14.7)	13 (19.7)	11 (9.6)	1 (2.4)	25 (7.2)
	HW	28 (11.7)	6 (10.0)	11 (10.9)	11 (14.3)	3 (11.5)	12 (11.2)	10 (13.2)	3 (10.3)	6 (8.0)	8 (12.1)	12 (21.4)	2 (4.9)	15 (4.4)
	TF	79 (33.1)	18 (30.0)	29 (28.7)	32 (41.6)	13 (50.0)	42 (39.3)	18 (23.7)	6 (20.7)	38 (50.7)	17 (25.8)	12 (21.4)	12 (29.3)	45 (13.0)
	FF	69 (28.9)	15 (25.0)	39 (38.6)	15 (19.5)	1 (3.8)	17 (15.9)	34 (44.7)	17 (58.6)	8 (10.7)	18 (27.3)	20 (35.7)	23 (56.1)	42 (12.2)
	MF	26 (10.9)	6 (10.0)	11 (10.9)	9 (11.7)	3 (11.5)	18 (16.8)	3 (3.9)	2 (6.9)	12 (16.0)	10 (15.2)	1 (1.8)	3 (7.3)	12 (3.5)
	p		0.72			<0.001				<0.001				0.417
Initiation of complementary Feed (n=301)	<4 mo	12 (3.9)	3 (4.0)	6 (3.9)	3 (4.2)	1 (4.8)	5 (3.5)	2 (2.0)	4 (10.5)	3 (3.6)	4 (4.0)	2 (2.7)	3 (6.8)	8 (2.3)
	4-6 mo	100 (33.2)	29 (38.7)	56 (36.1)	15 (21.1)	2 (9.5)	50 (34.7)	31 (31.6)	17 (44.7)	26 (31.0)	30 (30.0)	21 (28.8)	23 (52.3)	68 (19.7)
	>6 mo	189 (62.9)	43 (57.3)	93 (60.0)	53 (74.6)	18 (85.7)	89(61.8)	65 (66.3)	17 (44.7)	55 (65.5)	66 (66)	50 (68.5)	18 (27.6)	118 (34.3)
	p		0.175			0.026				0.092				0.634

[Table/Fig-3]: Breastfeeding, prelacteal and complementary feeding practices among the mothers and correlation with various factors.
mo: months. Fa: father; Mo: Mother; GP: Grandparents; L: Lower class; LM: Lower middle class; UM: Upper middle class; U: Upper class; I: Illiterate; P: Primary; S: Secondary; HS: Higher secondary; Hr: Hours; Gh: Ghutti; HW: water; TF: Top feed; FF: Formula feed; MF: Mixed feed

30% despite all efforts. The breastfeeding was significantly low where the grandparents were the decision makers (p<0.007). This indicates inadequate or inappropriate counselling. This is not only to counsel the mother but to include all the decision makers of the family during the counselling sessions. Not many studies have studied the impact of decision maker/household head on feeding practices. A recent study reported the influence of household head on infant feeding practices, practice of giving colostrum and EBF was less where decision maker was illiterate or had agriculture as profession [10]. In India, EBF rate was sub-optimal and the progress in this regard is very slow. Even though the institutional deliveries have gone up, the infant feeding practices have not shown much advancement [17]. However, in last one decade, this has shown some improvement due to increase in institutional delivery [13]. Studies have shown that counselling during antenatal stay and in mothers who attended antenatal clinics have better knowledge of correct breastfeeding practices and had increased rate of breastfeeding and lesser prevalence of practice of giving prelacteal feeds [10].

Initiation of breastfeeding within one hour was only 12.8% all being delivered institutionally. It is well documented in the literature that initiation of breastfeeding decreases neonatal mortality as well as morbidity [18,19]. According to WHO, in India only 15.8% of newborns were put to breast within first hour of birth whereas 37.1% were started feeding within 24 hours of birth. This may be due to inadequate support to the mothers in immediate post-partum period due to excessive workload in hospitals. A recent study done in South India reported higher rate of initiation of breastfeeding in first hour but continuation of EBF was low in institutional deliveries [20].

In this study, 17.6% of the baby did not receive colostrum at all, considering it as bad milk or indigestible for babies. Other Indian studies show higher percentage of mothers (39% to 56%) who discarded colostrum considering it dirty and indigestible [21,22]. This lower percentage of not using colostrum can again be attributed inadequate perinatal support to mothers and lack of knowledge. Majority of government hospitals do not have well trained full time breastfeeding counsellors in postnatal wards all the time. This counselling is mostly done by doctors and nurses on duty and on clinical rounds. About 47.6% mothers gave prelacteal feed to their infants. Different Indian studies have reported it to be between 36% and 74% respectively [21,23]. Honey and ghutti (local ayurvedic medicinal preparations) were most common prelacteal feeds given in this study. Results of Jain U et al., are similar to this study [22]. In this study, 78% mothers used bottles citing various reasons like baby is satisfied well, knew no other option for feeding, easy option while travelling, mothers get busy with household work, poor weight gain on breast feeds, on advice of grandmothers and relatives. A study by Parmar VR et al., have shown many reasons for initiation of bottle feeding like insufficient milk (59.7%), working mother (13%), to habituate the baby to bottle (12%), maternal illness and child illness (6.5%) [24]. Aggarwal A et al., in their study concluded that the most common reason cited to start early initiation of complementary feeding was insufficient breast milk (49.4%) [25].

Only 20.2% started complementary feeding in time and 63% after 7 months. According to Rao S et al., higher percentage (77.5%) of mothers initiated complementary feeding at appropriate time [26]. A recent study from South India reported high percentage of knowledge about weaning (82.6%), 20% started premature weaning and 80.9% started on completion of six months [27]. Study by Saxena V and Kumar P, in a rural community found that 25.1% children, below six months of the age were started early complementary feeding due to mothers' perception of "not having enough milk", or to "resume their jobs" [28]. Majority of mothers were ignorant about the correct consistency of complementary food, timings, number and quantity each time. Similar results were shown in a recent study by Srinivasa K et al., the most common reason for faulty feeding practices was lack of awareness [29].

In this study, we could find that there was a gap between knowledge. Despite 100% institutional delivery and multiple contacts, there were lacunae in knowledge among the mothers regarding advantages of breastfeeding only 60.8% were aware and regarding feeding of colostrum and harmful effects of prelacteal feeds the awareness were 70.4% and 57.2%, respectively. In practice the EBF was only 30% and the about 47.6% were give prelacteal deeds. These results showing a gap in knowledge and practice have been reported from both India and abroad [30-32]. Intriguingly, there was no significant association between literacy and improved feeding practices in this study. On the contrary, mothers with education of high school and above preferred giving formula feeds more as compared to illiterate mothers or lower educational level. Many studies have shown similar finding both in India and other developing countries [33,34]. [Table/Fig-4] shows various studies for assessing infant feeding practices [10,20,29-32].

Limitation(s)

This study only provides a glimpse into the existing lacunae in counselling during antenatal and post-natal health visits, but does not provide a complete picture of individual deficiencies in health care delivery. This was a single centre study, but as we recruited institutional deliveries from any centre that were following-up in our hospital, our results do not necessarily reflect the quality of counselling and postpartum care provided in the study institute. Recall bias may be another factor influencing the result of the study.

CONCLUSION(S)

Perinatal support along with proper counselling remains the key for improving breastfeeding in the infants. As the care providers are commonly not trained for the counselling and being busy in hospitals, posting of breastfeeding counsellors are essential for this purpose. Counselling should also include family members along with mother as their knowledge and practice also affects infant feeding practices. Counselling needs to be made more effective by training the personnel for counselling adequately and more full time counsellors should be always available in postnatal wards and during visits for vaccination to address the problems and myths of mothers regarding infant feeding. Separate compulsory counselling sessions should be provided along with immunisation on follow-up visits to ensure adequate reinforcement and to check the correct infant feeding practices being followed.

In past, various community and hospital-based studies have tried to assess breastfeeding practices but this study is closest to assess the knowledge and practices of mothers who have adequately received sufficient information and counselling during antenatal, postnatal and subsequent visits for vaccination. Other strengths of the study include a large sample size and adequate power. We studied the correlation of breastfeeding practices with factors like family type and decision maker in the family, which have not been studied before in such a large sample size.

Author (Year)	Type of study	n	Initiation of breast feeding within 1 hr.	EBF rate	Colostrum feeding	Prelacteal/ top feeding	Initiation of complementary feeding (CF)	Factors associated with inappropriate practices and remarks
Bhandari S et al., (2019) [10]	National survey (Nepal)	1015	41.8%	Predominant BF-57.2%	83.5%	32.7%	NA	Maternal age, socioeconomic status, place of residence(terai/hill)
Kalaivani A et al., (2019) [20]	Hospital based longitudinal	158	74%	42.4%	96.8%	3.2%	57.6% <6 months	Increased awareness and institutional delivery, milk insufficiency for early initiation of CF
Srinivasa K et al., (2017) [29]	Hospital based cross-sectional	202	22.7%	76.2%	82.1%	23.7%	25 % <6 months	Lack of knowledge
Sriram S et al., (2013) [30]	Hospital based cross-sectional	150	54.6%	28.6%	NA	34.6%	74% started at 6 months	Tea/jaggery MC prelacteal feed. lack of knowledge, insufficient milk, advice from family members
Vijayalakshami P et al., (2015) [32]	Hospital based cross-sectional	122	36.9%	27%	NA	NA	Majority (percentage not specified)	Gap between knowledge and practice
Balaji C et al., (2016) [31]	Hospital based cross-sectional	200	34.5%	72%	75%	10.5%	91.5% after 6 months	Not enough milk main reason Animal milk MC top feed used.

[Table/Fig-4]: Various studies from India assessing infant feeding practices (breast and complementary feeding) [10,20,29-32].

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