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Original Article

An Interventional Study to Enumerate the Causes of Lactation Failure, its Prevention and Management

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Abstract

Background: Three quarters of the world's population living in developing countries migrated from rural to an urban area. Since the health professionals are concentrated in the urban areas, the existing health services cater to only 20% of the rural population. Hence, there is an increased risk of bottle feeding in both urban and rural areas. There is a sharp decline in the practice of breastfeeding and an increase in the number of infants being artificially fed. In India, there is a decrease in the incidence of exclusive breastfeeding.

Aim: The aim of the study was to study an intensive educational program for mothers in the antenatal period, immediate postpartum period and during follow-up for 4–5 months in a tertiary care institute, and to achieve an exclusive breastfeeding rate of 80% among the mothers and study the impact of the intervention program.

Methodology: A prospective randomized study was done allocating the mothers into two groups – study and control group.

Conclusion: Exclusive breastfeeding has shown a definite decline globally. The practice of breastfeeding is down but definitely not out. Hence, it becomes our duty as health-care providers to teach mothers about the importance of breastfeeding. In the present study, even though a majority of mothers had adequate knowledge about breastfeeding, many of them did not practice what they knew. Hence, we should try to analyze the factors which hinder their breastfeeding practice.

Key words: Breastfeeding, Bottle feeding, Health professionals, Knowledge, Lactation failure

INTRODUCTION

The breast milk is unique and scientifically adapted for the growth and development of each mammalian species. The ultimate objective remains the same – safeguarding growth and development until the offspring is able to acquire its own food and survive without mother.

Western countries where the incidence of breastfeeding is low, having realized the importance of breast milk are now actively campaigning for exclusive breastfeeding for the first 6 months.[1,2] However, in our country, despite breastfeeding being a traditional practice, it has lost its importance, and more and more people are changing to bottle feeds.

"Bottle" is the biggest killer of babies in developing countries. Bottle-fed babies have 2–7 times increased risk of mortality compared to breastfed babies.

Need for the Study

Three quarters of the world's population live in developing countries. Because of the migration from rural to an urban area, 80% of our population live in urban areas, and 20% of our people are rural residents. Since the health professionals are concentrated in the urban areas, the existing health services cater to only 20% of the rural population. Hence, there is an increased risk of bottle feeding in both urban and rural areas. There is a sharp decline in the practice of breastfeeding and an increase in the number of infants being artificially fed. In India, there is a decrease in the incidence of exclusive breastfeeding. The practice of giving pre-lacteal feeds is almost universal in rural, urban slums, and urban rich.

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Some factors contributing to the increasing incidence of artificial feeding in India are:

1) Changing lifestyles and increased number of working mothers
2) Availability of easy alternatives to breast milk
3) Aggressive publicity and deceptively appealing advertisement regarding formula feed in mass media.

Working women, those belonging to the lower socioeconomic class are forced to return to work early following childbirth forcing them to use formula feeds for their infants.

Why does the mother not breastfeed her baby? What makes her to take bottle feeds after successful initiation of breastfeeds? Hence, our study was planned to answer the above questions.

Aim of the Study

The aim of the study was to study an intensive educational program for mothers in the antenatal period, immediate postpartum period and during follow-up for 4–5 months in a tertiary care institute, and to achieve an exclusive breastfeeding rate of 80% among the mothers and study the impact of the intervention program.

MATERIALS AND METHODS

Place of Study

The antenatal outpatient department, postnatal and post-operative wards in the department of obstetrics and gynecology, at a tertiary care institute.

Follow-up of cases to be done in the well-baby clinic and pediatrics outpatient department; house visits were made to nearby areas using the vehicle and staff available in the postpartum program.

Duration of Study

This study was 1 year from June 2018 to May 2019.

Study Design

A prospective randomized study was done allocating the mothers into two groups – study and control groups.

1. Study group: Mothers attending the antenatal outpatient department on Mondays and Tuesdays were enrolled under study group. These mothers were given extensive advice about the importance of breastfeeding, its advantages, the technique of breastfeeding by showing posters, placards.
2. Control group: Mothers coming on Thursdays and Fridays to the above outpatient department were enrolled in the control group. These mothers formed the nonintervention group and were merely registered in the control group.

Three different precoded, prestructured, and pro forms were prepared, one to be used in the antenatal period, one in the postnatal period, and one for follow-up visits.

After preliminary nutrition and health status, presence or absence of major systemic illness, their knowledge, and attitude toward breastfeeding were recorded for each group.

As outlined before, the study group received the intervention. Mothers were then followed up in the postnatal wards, and post-operative wards following delivery and advice continued for the study group.

The counseling and follow-up were done by two social workers specifically trained for this work and by the research fellow.

Exclusion Criteria

Babies admitted in the preterm ward and sick neonatal ward of our hospital were not included in our study.

Data Analysis

Data analysis was performed using the epidemiological information package developed by world health organization. Comparison of data was done by univariate analysis. *P* value was determined using the ANOVA method.

RESULTS

Total number of cases: 500.
Number of cases in the study group: 304.
Number of cases in the control group: 196.

DISCUSSION

In the present study, the percentage of exclusive breastfeeding in the study group was 69% and that of the control group was 21% [Figure 1]. Previous studies have shown the incidence of exclusive breastfeeding in an urban population to be 36.6%. The national family health survey[3] has shown that the incidence of exclusive breastfeeding in Tamil Nadu to be 55.8% and in India to be

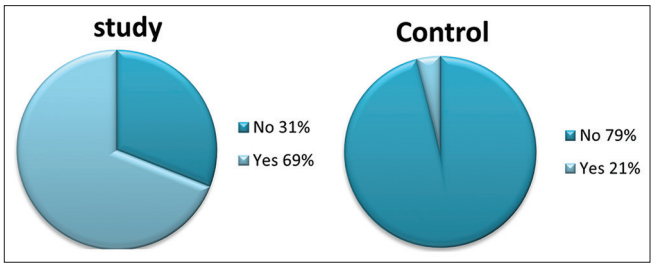

Figure 1: Percentage of exclusive breastfeeding

51%. In our study, the incidence of exclusive breastfeeding in the control group where no intervention is given to the mothers is 21%, this is much less than all Indian figures since the study was done in a predominantly urban area[4,5] where the incidence of breastfeeding is less than rural areas. This shows how simple intervention like advice to mothers about the importance of breastfeeding, the technique of breastfeeding, time of initiation of breastfeeds after delivery has gone a long way in improving the exclusive breastfeeding rate.

The maternal weight [Table 1] has no role in determining the exclusive breastfeeding rate. This has been in many previous studies of preterm and low birth weight (LBW) babies.[6] The socioeconomic status was assessed using the Kuppusamy's scale. Mothers with a total monthly family income of <Rs. 1500, had better exclusive breastfeeding rates when compared to mothers with a total monthly family income of more than Rs. 1500, the results were also statistically significant ($P < 0.05$) [Table 1].

About 48.3% of mothers in our study were primiparous women [Table 1]. However, there was no statistically significant difference ($P > 0.1$) in exclusive breastfeeding practice between the primiparous and multiparous women.

The percentage of booked cases was 98.7% and 94.1% in both study and control group [Table 2]. This percentage is higher when compared to our hospital statistics since our hospital does not consider antenatal checkups done outside the hospital as being booked cases. In Tamil Nadu, about 93% of mothers in rural areas and 97% of mothers in urban areas received antenatal care. In the whole of India, only 62% of the mothers received antenatal care.

The mean age of mothers enrolled in the study group is 23.59 years and in control group is 24 years. About 24% of the mothers were still younger than 20 years at the time of pregnancy. There was no statistically significant difference in the rate of exclusive breastfeeding among the different age groups.

Breast examination should be done routinely during the antenatal checkup to look for retracted nipples, inverted nipples since there are potentially correctable conditions if treatment is started early. If not corrected, they may cause a delay in the initiation of breastfeeding. Unfortunately, only about 6.7% of mothers said that their breasts were examined in the antenatal period in the present study. Examination of the breast was not done in 94% of the case, in spite of the study being conducted in a referral hospital [Table 2].

The number of times the health worker makes contact with the mother in the antenatal period to give advice about breastfeeding is also important in the present study. It has been shown that mothers who had received advice about breastfeeding more than 3 times had a better exclusive breastfeeding rate than those received a lesser number of times of advice [Table 2]. This was also found to be statistically significant ($P < 0.01$).[7] The results were the same for advice given by doctors, nurses, or social workers.[8]

Table 1: Sociodemographic data

Particulars	Study %	Control %
Mothers age (years)		
<20	19.1	23.9
21–25	59.6	41.3
26–30	17.4	30.5
31–35	2.8	4.3
>35	1.1	0
Mean age (years)	23.5	24.0
Mothers weight (kg)		
<35	0	0
36–40	7.9	13
41–45	26.5	17.4
46–50	27.7	23.9
51–55	17.6	21.7
56–60	10.9	8.7
>60	9.6	15.2
Mean weight (kg)	49.7	50.93
Height of mothers (cm)		
<140	7.3	2.2
141–145	10.2	8.7
146–150	28.8	15.2
151–155	26.4	34.8
>155	27.3	39.1
Mean height (cm)	151.0	153.0
Residence		
Urban	56.9	48.8
Rural	43.1	51.2
Educational status of mother (standard)		
Illiterate	14.1	18.9
1–5	28.8	21.6
6–8	24.3	27.0
9–10	19.8	21.6
11–12	9.6	8.2
Graduate	3.4	2.7
Occupation		
Housewife	825	80.0
Unskilled	15.2	508
Semiskilled	0.6	14.3
Skilled	1.7	0
Family status		
Nuclear	54.5	66.7
Joint	45.5	33.3
Socioeconomic status		
<500	0.6	-
500–1000	36.6	35.6
1001–1500	29.8	28.8
>1500	33.1	35.6
		(*P* value-0.04)
Parity		
Primi	48.3	43.5
Gravida2	32.4	34.8
Gravida3	13.6	15.2
Multigravida	5.7	6.5

Table 2: Antenatal data

Particulars	Study %	Control %
Booked	98.7	94.1
Unbooked	1.3	5.9
Place of booking		
GRH	70.6	50.2
PHC	7.4	5.3
Subcenter	11.7	33.2
Private hospital	10.4	14.4
Number of visits		
<3	17.2	3.2
3–5	49	54.4
6–8	32.5	31.9
>8	1.3	0.4
FST given		
Yes	99.2	96.0
No	0.8	4.0
Tetanus toxoid given		
Yes	100	98.9
No	0	1.1
Number of doses of tetanus toxoid		
1	5.5	9.7
2	94.5	90.3
Number of times breastfeeding advice given		
≤3	55	-
4–5	32.2	-
>6	12.8	-
By whom?		
GRH staff	95.5	-
Others	4.5	-
Breast examination done		
Yes	6.7	3.7
No	93.3	96.3
Nature of delivery		
Normal	88.8	86.0
Cesarean	11.2	14.0
Sex of the baby		
Male	52.9	47.2
Female	47.1	52.8
Mean weight of the baby (gm)	2833.5	2733.11
Gestational age		
Preterm	1.4	2
Term	98.0	97
Post-term	0.6	1
Nature of the feeds given to the baby		
Breast milk	87.2	81.9
Others	12.8	18.1
Time after which feeds given to the baby (minutes)		
<30	37.2	10.7
31–60	1.8	22.6
61–120	14.6	11.9
121–180	6.7	7.8
>181	0	39.6
Colostrum		
Given	100	98.9
Not given	0	1.1
Discharge particulars		
Length of the baby (cm)	46.59	46.26
Weight of the baby (gm)	2768	2784

GRH: Government hospital, PHC: Primary health centre, FST: Ferrous sulfate tablets

This shows that the basic requirement for breastfeeding is to motivate the mothers, instill confidence in her ability to breastfeed and clear her doubts about lactation. This

Table 3: Knowledge about breastfeeding

Knowledge about breastfeeding	Yes %	No %
A. Benefits of breastfeeding to the newborn with respect to		
1. Nutritional aspects	80.5	19.5
2. Protective value	79.9	20.1
3. Psychological aspects	79.3	20.7
B. Benefits of breastfeeding to the mother	79.9	20.1
C. Benefits of colostrum	76.8	20.1
D. No prelacteal feeds	77.4	22.6
E. Exclusive breastfeeding for a minimum period of 4 months	78.7	21.3
F. Breast milk can be fed soon after cesarean section	78	22
G. Proper breastfeeding technique	77.4	22.6
H. Demand feeding, rooming in practices	76.8	23.2
I. Mothers diet during pregnancy and lactation	82.3	17.7
J. Artificial feeds are an economic burden to the family	80.5	19.5

Table 4: Time of transfer

Time of transfer of the baby toward (minutes)	Study %	Control %
<30	1.8	3.8
31–60	7.3	12.0
61–120	31.6	24.6
121–180	17.6	18.1
>180	41.7	41.5
<30	1.8	4.4
31–60	8.6	13.1
61–120	32.9	24.0
121–180	15.8	17.5
>180	40.9	41.0

shows how a simple intervention can go a long way in reducing morbidity and mortality due to the use of formula feeds. As previously mentioned, the economic benefits are also enormous. Breast milk was given initially in 87% of babies in the study group in contrast to 82% of babies in the control group [Table 2]. This difference was not statistically significant.

Colostrum was not discarded by mothers in this study in contrast to previous studies.[9] Almost 100% of the mothers gave colostrum to their babies [Table 2]; this is a very welcoming trend. This could be due to the hospital-based nature of the study.

There is a sharp increase in the introduction of artificial feeds between 2 and 3 months of age. Hence, effective intervention in this period (60–90 days) of postnatal life in the form of lactation counseling will benefit in the long run.

There is a greater incidence of exclusive breastfeeding in male babies than female babies. However, in the present study, no such statistically significant difference was noted [Table 2].

Table 5: Postnatal data - Anthropometry

Particulars	Visit 1		Visit 2		Visit 3		Visit 4		Visit 5	
	S	C	S	C	S	C	S	C	S	C
Age (days)	45	45	75	75	105	105	134	134	165	165
Weight (gm)	4127	3732	4803	4275	5387	4734	5917	5192	6448	5669
Length (cm)	51.46	51	54	53	56	55	58	57	60	58.5
Head circumference (cm)	37.0	36	38	37	39.5	38	40.3	39	41	39.7
					P<0.01		*P*<0.01		*P*<0.01	

S: Study, C: Control

Table 6: Number of breastfeeds per day

Group	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5
Study	13	11	10	8	7
Control	11	10	8	7	6
			P<0.01	*P*<0.01	*P*<0.01

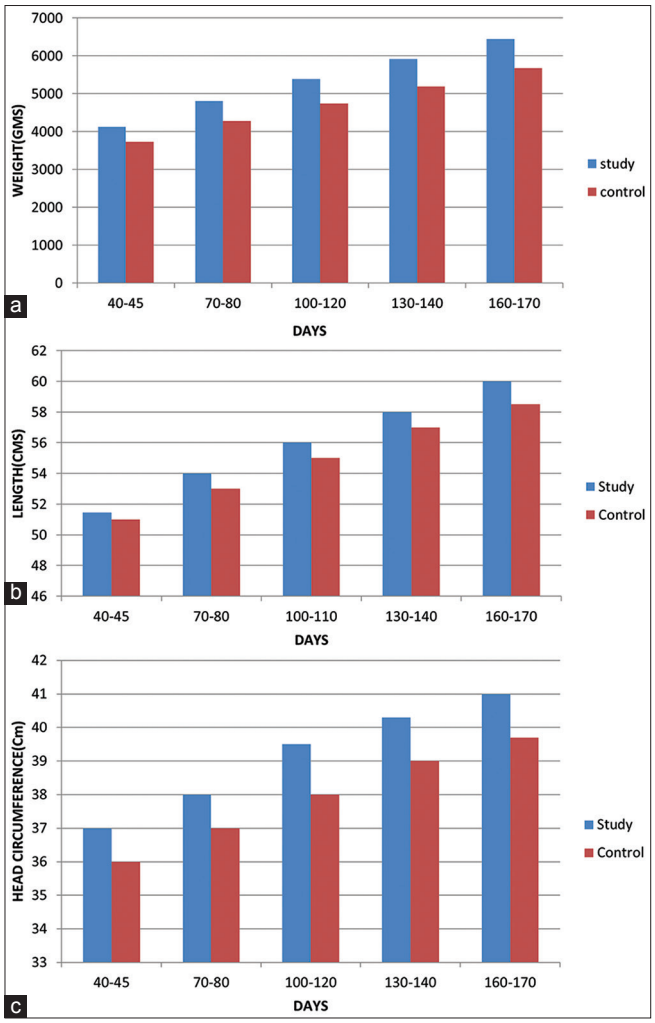

Figure 2: Anthropometry (a) weight of the baby, (b) length of the baby, (c) head circumference of the baby

The gestational maturity of the baby, birth weight, and nature of delivery had no influence on the outcome of exclusive breastfeeding [Table 2].

Iron and folic acid tablets were received by 99% of mothers [Table 2]. Overall, in India, 51% of mothers received iron and folic acid tablets.[5]

Two doses of tetanus toxoid (TT) were given to 94.5% of women in our present study [Table 2]. In Tamil Nadu, mothers received two or more TT injections for 90% of the birth.[9] In India, mothers received two doses of TT in only 54% of births.

Before giving advice to mothers, their existing knowledge about breastfeeding was assessed. Following this, advice was given to them and their doubts cleared. The following percentage of mothers had existing knowledge about breastfeeding [Table 3]. About 81% of the mothers knew about the nutritional value of breast milk. About 79% of the mothers had knowledge about the protection offered to infants and psychological benefits of breastfeeding. About 80% of the mothers knew about the benefits of breastfeeding to them and about the lactational amenorrhea in preventing pregnancy. About 77% of the mothers knew about the importance of colostrum and that it should not be discarded after birth. About 79% of the mothers had the knowledge that only breast milk and not any other feeds including prelacteal feeds should be given to the baby after birth. A similar percentage of women said exclusive breastfeeding should be continued for at least 6 months of age. About 77% of the mothers said that they knew about the technique of breastfeeding and feeding on demand. About 81% of the mothers felt that the artificial feeds given to the babies resulted in a severe economic burden to the family. About 83% of the mothers said that they had to increase their nutritional requirements during lactation.

Another interesting aspect of this study is to note the time taken to shift the mother and baby from the labor ward and operation theater to the postnatal and post-operative wards, respectively [Table 4]. Only 2% of the mothers and babies were shifted to the postnatal ward from labor ward within 30 min of delivery. Babies were not given to mothers to breastfeed in the labor ward within 30 min of delivery as suggested by the "baby-friendly hospital initiative." Sometimes babies were given to the relatives waiting outside, and prelacteal feeds were given by them.

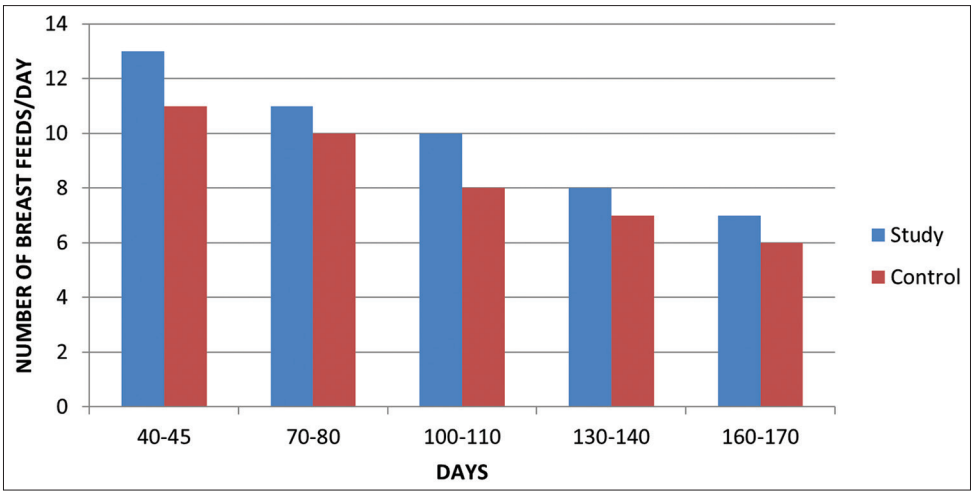

Figure 3: Number of breastfeeds per day

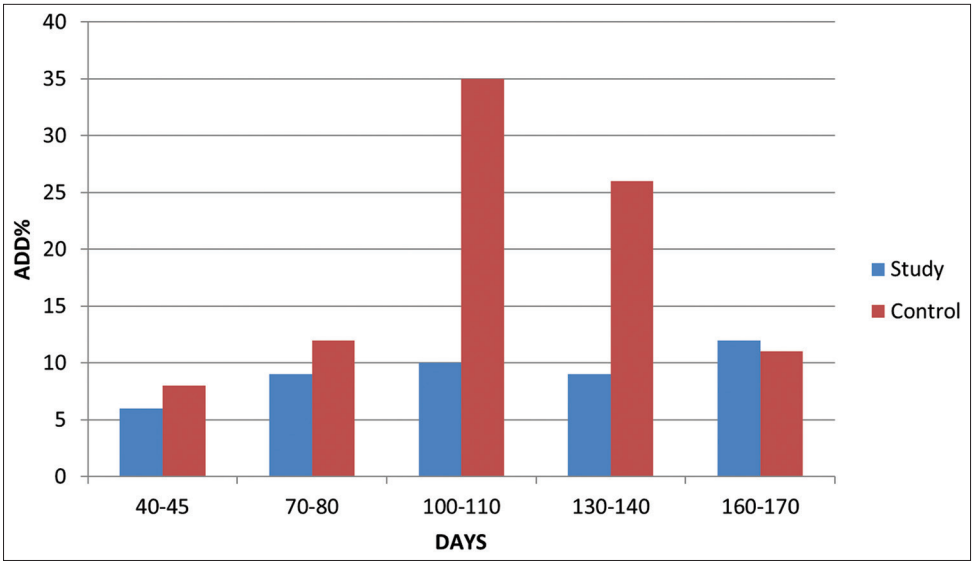

Figure 4: Illness in the child-acute diarrheal disease

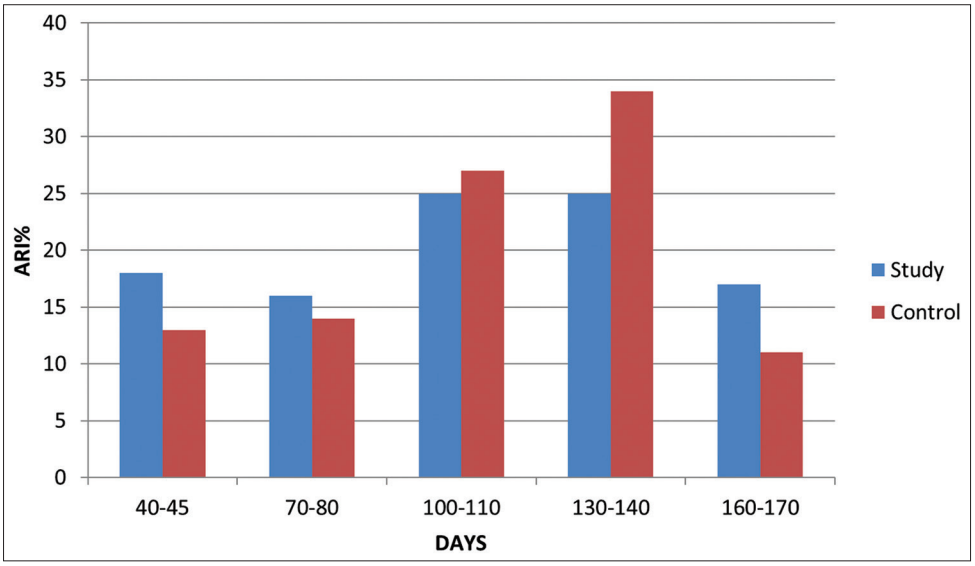

Figure 5: Illness in the child – acute respiratory infection

This resulted in a delay in the initiation of breastfeeding. With regard to cesarean section, only a few of the mothers and babies were transferred to post-operative ward within 30 min of delivery. Majority of them were shifted between 1 and 2 h after delivery. This is comparable to the national family health survey data which say only 22% of babies in Tamil Nadu are put to the breast within 1 h of birth. This indicates the need to educate mothers, her relatives, healthcare workers concerning the importance of immediate commencement of breastfeeding after delivery.

The anthropometric measurements show a statistically significant difference ($P < 0.01$) in the height, weight, and head circumference of the babies in the study and control groups [Table 5]. There was better growth of the babies who were exclusively breastfed than in those babies for whom supplementary feeds were started early [Figure 2a-c]; this also applies to preterm babies and LBW babies.[5] Various studies have clearly shown this difference. The number of breastfeeds given per day in both groups varied from 7 to 12 in the first 4 months of life [Table 6], but in the study group there was a statistically significant ($P < 0.01$) difference in the number of breastfeeds per day during the 3rd–4th visits in contrast to the control group where the introduction of supplementary foods was common during these visits [Figure 3], reinforcement of the advice to these mothers during their postnatal follow-up motivated them to continue exclusive breastfeeding. With decreasing breastfeeds per day in the control group, the mothers thought that their milk production was declining and turned toward bottle feeds to supplement breast milk. This leads to cut down of their prolactin reflex, resulting in lactation failure. It has been shown that nearly 30% of infants are given water or other supplements by 1 month of life.

The mean duration of exclusive breastfeeding in the study group is 104 days and that in the control group is 88 days. This difference is statistically significant ($P < 0.01$) [Table 7].

In our present study, nearly 85% of mothers continued to give breast milk in addition to weaning foods even after 4 months of age of the baby [Table 7], this is comparable to the all India figure of 95%. In the present study, only 7% in the study group and 15% in the control group stopped breastfeeds completely before 4 months of age [Table 7]. This shows that with good advice to the mother, the introduction of supplementary foods can be avoided and exclusive breastfeeding practiced.

In the present study, the incidence of acute diarrheal disease and acute respiratory infection is more in the control group [Table 8] where the incidence of exclusive breastfeeding rate is less, similar to other study.[10] The incidence of acute diarrheal disease and acute respiratory infection showed a statistically significant reduction in the 3rd–4th visits in the study group as compared to control group ($P < 0.05$) [Figures 4 and 5], this shows that with continued advice about breastfeeding to the mother, exclusive breastfeeding can be achieved resulting in healthier babies.

Thus, overall, nearly 80% of mothers had knowledge about breastfeeding. The importance of exclusive breastfeeding was reinforced, and their doubts cleared during their antenatal visits.

The nutritional deficiency was found in 4% of the mothers. Anemia (who criteria of hemoglobin <10 gm/dl) and angular stomatitis were the most common deficiencies noted.

The mean weight of the mothers was 50 kg. There was no statistically significant difference in exclusive breastfeeding practice in a different distribution of weights. Similarly, the height of the mother and the age of the father had no influence over the exclusive breastfeeding practice.

About 51.2% of the mothers in rural areas and 48.8% of the mothers in urban were enrolled in our study. There was no difference in the exclusive breastfeeding rate among the two groups. This was against the results available in previous studies. These studies showed that rural mothers had a better exclusive breastfeeding rate than urban mothers.

Literacy and occupation of the mothers in the present study made no difference in exclusive breastfeeding practiced by them.

Table 7: Details about breastfeeding

Particulars	Study	Control
Number of days exclusively breastfed (mean days)	104	88
Number of days after which breastfeeding was stopped (days)	%	%
<30	2.3	3.2
31–60	0.3	0.8
61–90	1.6	1.6
91–120	2.9	2.4
>120	7.4	7.1

Table 8: Illness in the child

Particulars	Visit 1		Visit 2		Visit 3		Visit 4		Visit 5	
	S	C	S	C	S	C	S	C	S	C
ADD%	6	8	9	12	10	35	9	26	12	11
ARI%	18	13	16	14	25	27	25	34	17	11
					P<0.05		*P*<0.05			

S: Study, C: Control, ADD: Acute diarrheal disease, ARI: Acute respiratory infection

Around 54% of the mothers came from nuclear families and 46% of the mothers from joint family. There was no difference in breastfeeding practice between the two groups. Some mothers took galactagogues but there was no statistical difference in the exclusive breastfeeding rate. Relactation was not initiated in this study, unlike another study.[7]

CONCLUSION

Exclusive breastfeeding has shown a definite decline globally since the second half of the last century. The practice of breastfeeding is down but definitely not out. Hence, it becomes our duty as health-care providers to teach mothers about the importance of breastfeeding.

In the present study, even though a majority of mothers had adequate knowledge about breastfeeding, many of them did not practice what they knew. Hence, we should try to analyze the factors which hinder their breastfeeding practice. The factors which contributed to lactation failure in the study are:

1. Lack of motivation on the part of the mother to breastfeed her baby. Lack of support from other members of the family particularly from mother in law aggravated this problem
2. There is a traditional belief that breastfeeds should not be given at times of illness to the babies. Hence, the mothers stopped breastfeeding during acute diarrhoeal disease and acute respiratory infection in their babies
3. Lack of adequate maternal leave forced the mothers to return work early
4. Retracted and inverted nipples which were not looked after in the antenatal period caused difficulty in breastfeeding
5. Family problems lead to emotional turmoil in the mother resulting in decreased prolactin reflex which further diminished milk production.

Hence, the above study, although limited to an urban hospital, more or less reflects the breastfeeding habits in our society. It also shows areas of lacunae and indifference on the part of healthcare workers in educating and guiding mothers about breastfeeding. They are actually in a strategic position to help these mothers since contact is established with them even in the antenatal period.

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