ORIGINAL RESEARCH

Prevalence of cow milk ingestion and ingestion of formula feeds up to 6 months of age inpatients of a tertiary care center

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ABSTRACT

Background: Human breast milk contains everything that is required for the infant in every aspect. Studies reveal that infants who are exclusively breastfed have a significant effect on prevention of rotavirus diarrhea, which is one of the common infections among infants due to wrong feeding practices, thereby signifies the immunological importance of breast milk.

The point of this study is primarily to assess the prevalence of the use of cow milk and use of formula feed in infants less than 6 months of age which we indirectly infer the pattern of exclusive breastfeeding practices in mothers. Any practice without proper knowledge and reasoning can always be harmful. This study documents the knowledge, attitude towards it, practices of exclusive breastfeeding among mothers which assess the awareness about exclusive breastfeeding, signifies the effectiveness of the follow up advice given during discharge as this advice of great importance in infant rearing. On whole, the study shows the importance of follow-up advice during discharge with that of the practices done by the mothers which play an important role in knowledge and awareness.

OBJECTIVE

1. To find out the prevalence of ingestion of cow milk and formula feeds among upto 6 months of age inpatients.
2. To assess the awareness of exclusive breastfeeding among mothers.

Materials

Study design: Cross-sectional study.
Study duration: 6 months.
Study sample: 350.

Conclusion

The study suggests, there is a need strengthening of ideas and propagation of knowledge which would bring down these practices. It is evident that the place of follow-up advice during discharge has a significant role and with increase in parity has obviously resulted in lesser usage of these feeds, strengthening the awareness and knowledge among primi mothers along with the need for educating of the family members especially elders of the family towards breastfeeding through a multi-disciplinary approach and need for a government programme which would make it possible right from the roots of our medical system.

Key words: Breast feeding, cow milk and formula feeds

INTRODUCTION

Human breast milk contains everything that is required for the infant in every aspect [1, 2, 3, 4, 5, 6, 7]. Studies reveal that infants who are exclusively breastfed have a significant effect on prevention of rotavirus diarrhea, which is one of the common infections among infants due to wrong feeding practices, thereby signifies the immunological

importance of breast milk [8, 9, 10]. Moreover, exclusive breastfeeding has a significant reduction in risk of wasting than that of infants who received supplementary feeds along with breastfeeding [11]. Introduction of complementary feeds too early in the life of infants i.e., early weaning, can lead to undernutrition which directly affects their age-appropriate growth. When exclusively breast feed infants compared with those with supplements in addition to breast milk, it is observed that the supplements provided less than 30% of the caloric requirement [12]. Newer upcoming studies strongly point more towards supporting exclusive breastfeeding.

Hence it directly states that none of the artificial or any other substitutes would be close enough, to be specific good enough to replace mother's breast milk for an infant.

With the knowledge about breast milk, its adaptability, and benefits of doing it, WHO recommends exclusive breastfeeding for 6 months of age and to be continued till 2 years of age along with complementary feeding [13].

Hence the growth and development of a child entirely lie with the person taking care of the infant. In 99% cases, mother being the one looking after the child, mother plays a major role in the growth and development of an infant.

So, we can conclude for a fact that knowledge of the mother plays a major role in the growth and development of an infant.

In current, sub optimal breast-feeding practices, including non-exclusive breastfeeding contribute a significant proportion of under-five mortality [14]. This can be attributed to the knowledge on the subject about infant feeding practices of the mother.

Most mothers add other feeds with an idea of extra nutrition and some due to potentially harmful beliefs. The most preferred ones are the animal milk and at times formula feeds at instances. There are various causes that people use these feeds ranging from insufficient milk to absolute contraindications for breastfeeding. There is a common practice of using vasambu, gripe water for colic pain and others [14]. These practices hinder the practice of exclusive breastfeeding. There are a lot of other factors that influence the practice of early complementary feeding.

RATIONALE

The point of this study is primarily to assess the prevalence of the use of cow milk and use of formula feed in infants less than 6 months of age which we indirectly infer the pattern of exclusive breastfeeding practices in mothers. Any practice without proper knowledge and reasoning can always be harmful. This study documents the knowledge, attitude towards it, practices of exclusive breastfeeding among mothers which assess the awareness about exclusive breastfeeding, signifies the effectiveness of the follow up advice given during discharge as this advice of great importance in infant rearing. On whole, the study shows the importance of follow-up advice during discharge with that of the practices done by the mothers which play an important role in knowledge and awareness.

REVIEW OF LITERATURE

1. Nithin Joseph, Unnikrishnan B and nelliyayanil in their longitudinal study of infant rearing practices in their study area with follow up for a year with194 infants concluded that 33.5% newborn were feed with pre-lacteal feeds.
2. Raghavendra K and Pooja V cross sectional study on harmful child rearing practices in south Indian population concluded that 67.3% gave pre-lacteal feeds.
3. Sadhasivam M, Kanagasabapathy S. Pre-lacteal feeding practice among rural mothers in Tamilnadu-a questionnaire-based study.
4. Taye, A.A., Asegidew, W., Taderegew, M.M. *et al*. Formula feeding practice and associated factors among mothers with infants 0–6 months of age in Addis Ababa, Ethiopia: a community-based cross-sectional study, had wide prevalence of use of these feeds.

AIM

Prevalence of cow milk ingestion and ingestion of formula feeds upto 6 months of age inpatients of a tertiary care center.

OBJECTIVE

1. To find out the prevalence of ingestion of cow milk and formula feeds among upto 6 months of age inpatients.
2. To assess the awareness of exclusive breastfeeding among mothers.

Materials

Study design: Cross-sectional study.
Study duration: 6 months.
Study sample: 350.
Study place: Tertiary Care Center.

Sample size selection

Sample size was calculated based on a previous longitudinal South Indian study by *Nitin Joseph et al*. 33.5% of them have been given pre-lacteal feeds, thus arriving at a sample size 343 rounding to a sample size of 350.

Selection criteria

Inclusion criteria

1. All infants between 0-6months of age admitted inpatient.

Exclusion criteria

1. Mother with absolute and relative contraindications in breastfeeding.

Methodology

The clearance from the Ethical committee was obtained from the Institutional Ethical Committee as it involved humans from the ethical committee of the tertiary care centre. The subjects were recruited based on inclusion and exclusion criteria. Proper consent was obtained the mother. The study is a one-point study and no follow up was carried out.

Anthropometric measurements were taken and plotted on a growth chart. The clinical profile of the patient is obtained and then a series of semi-structured questionnaires were used to assess the knowledge, the attitude and the practices regarding breastfeeding of mothers. Data were tabulated under headings.

Statistical analysis

Statistical analysis is done using SPSS software. It is used to enter data and analyze them. The quantitative variables expressed as mean +/- SD, whereas qualitative data expressed as percentages. Chi-square test is applied to determine the differences between the groups. All statistical analysis is carried at 5% level of significance and P value less than 0.05 is considered statistically significant.

RESULTS AND OBSERVATION

A total of 350 subjects participated in this study including term and preterm babies who were admitted inpatient in the tertiary care center.

146 were female infants and 203 were male infants and one infant was unambiguous sex infant. Out of 350, 228 infants were term babies and 122 were preterm babies.

The most common cause for admission is neonatal jaundice followed by bronchiolitis. The mean birth weight among preterm infant is 2.1± 0.5 kg and that of term infant is 2.8 ± 0.4 kg.

Table 1: Age distribution

Age	>20 years	20-25 years	>25 years
Childbirth in primi (%)	15.1	37.9	47
At the time of marriage (%)	38.2	42.8	19

39.1% (n=137) of the infants had previous admission in NICU. In 52.9% (n=185) infants breastfeeding was not initiated within 1 hour of birth.

Table 2: Place of delivery

Institutional delivery or not	Tertiary care center	Government hospital	Primary health care center	Private hospital	Not an institutional delivery
Percentage	79.4	6.6	11.2	2.6	0.2

Tertiary care center and primary health care center were the places most deliveries are conducted. On whole, 99.8% of the deliveries conducted were institution which coincides with state wise data provided by the NFHS-5. 0.2% (n=1) of the delivery was conducted in a non-institutional setup but clean cord clamping and cutting was practiced. Follow-up advice were given in institutionalized births rather than in a non-institutional setup.

56% (n=198) are prim gravida and 0.5% (n=2) are grand multi. Parity is considered, as increase in parity would change the knowledge and attitude towards infant feeding practices

Table 3: Education of mother

Education of the mother	Illiterate	Primary	Secondary	Senior secondary	Degree
Percentage	4.3	3.1	20.3	37.4	34.9

Out of the 37.4%, 3.1% (n=11) were with diploma in nursing and 1.1% (n=4) had degree in nursing. 33 of women were working women with occupation ranging from coolie to white collar jobs. 86.6% (n=303) of the women were from rural areas.

Most of them have completed diploma in technical courses. With COVID-19 hitting most of these people socioeconomic class dropped significantly in most of the families.

With many ending up jobless, more often graduates working as coolies, this situation takes a lot of time to recover.

Ante-natal visits: 0.8% (n=3) never had regular antenatal visits during pregnancy.14.3% of the mothers had been given counseling during ante-natal checkups.

Discharge advive:13% of the mothers were not given follow-up advice during discharge.

Knowledge: Out of 350, 108 (31%) of the mothers were not aware of exclusive breastfeeding. 288 (82%) said breast feeding alone was enough for the first 6 months growth and development of their infants. Mothers knew that breast milk was only good source

of nutrients for their infant, but only 137 (39%) knew exactly how it helps and its properties. 98% (n=343) feel that it was essential to feed the infant as early as possible and 125 (36%) had feed their infants within half an hour of birth. 99.9% of mothers encourage breastfeeding to other breastfeeding mothers. Similarly, most family members have encouraged and supported breast feeding especially by the father. 49.4% (n=173) were not aware when exactly to start complementary feeding while other 177 (50.6%) were exactly aware of it.

Attitude

79% (n=279) of the mothers preferred breast milk (to practice exclusive breast feeding) to be the only source of nutrition for their infant. While others preferred breast milk along with water. A few wanted to use others along with breast milk. 88% (n=308) felt it is essential to give colostrum but only 68.5% were able to feed colostrum.

Practice

The prevalence of ingestion of cow milk and formula feeds as follows.

Table 4: Prevalence of ingestion of cow's milk and ingestion of formula feeds

Feed used	Cow's milk	Formula feed
Percentage	7.7	7.7

Cow s' milk and formula feeds were used as a result of insufficient milk production by the mother which resulted in using these alternate feeds.

Nearly 24.5% (n=86) had used pre-lacteal feeds. Most common of them being gripe water which was given for colic pain. Second most used was vasambu which was both used orally and topical

Table 5: Percentage of cow milk user with respect to education

			Cow's Milk		Total
			No	Yes	
Mothers Education	Illiterate	Count	12	3	15
		% Within Mothers Education	80.0%	20.0%	100.0%
	Primary	Count	10	1	11
		% Within Mothers Education	90.9%	9.1%	100.0%
	Secondary	Count	65	6	71
		% Within Mothers Education	91.5%	8.5%	100.0%
	senior secondary	Count	111	9	120
		% Within Mothers Education	92.5%	7.5%	100.0%
	Degree	Count	112	6	118
		% Within Mothers Education	94.9%	5.1%	100.0%
	D nursing	Count	10	1	11
		% Within Mothers Education	90.9%	9.1%	100.0%
	Degree nursing	Count	3	1	4
		% Within Mothers Education	75.0%	25.0%	100.0%
Total		Count	323	27	350
		% Within Mothers Education	92.3%	7.7%	100.0%

Second most used was vasambu which was both used orally and topical application on the umbilicus. Others includes honey, oil, biscuits smashed in water and apples.

Variables were analyzed from data of the infants and mother with that of responses by them to find significant relationship. First, the mother's educational status with that of her response. A small cross sectioning was done i.e., mothers who had diploma in nursing and degree in nursing.

A similar trends of cow milk usage and formula feed usage was observed.

Among primi mothers (n=198), there was significant was a significant association of educational status and the usage of formula feeds which is shown is table 6 and 7b. But in mothers who used cow's milk, mother's education did not have any association with practices she followed. Paternal education had no association with respect to practices.

Table 6: Percentage of formula feed user with respect to education

			Formula feeds		Total
			No	Yes	
Mothers Education	Illiterate	Count	15	0	15
		% Within Mothers Education	100.0%	0%	100.0%
	Primary	Count	5	6	11

		% Within Mothers Education	45.4%	54.6%	100.0%
	Secondary	Count	69	2	71
		% Within Mothers Education	97.2%	2.8%	100.0%
	senior secondary	Count	112	8	120
		% Within Mothers Education	93.3%	6.7%	100.0%
	Degree	Count	108	10	118
		% Within Mothers Education	91.5%	8.5%	100.0%
	d nursing	Count	10	1	11
		% Within Mothers Education	91%	9%	100.0%
	degree nursing	Count	4	0	4
		% Within Mothers Education	100.0%	0%	100.0%
Total		Count	323	27	350

With raise in parity, there was a significant less usage in these feeds attributing to the repeated follow up advices given after child birth, also with experience gained during the child birth.

Tables 7a & 7b: with respect to parity

			Cow's Milk		Total
			No	Yes	
Birth order	1	Count	185	13	198
		% Within Birth order	93.4%	6.6%	100.0%
	2	Count	96	11	107
		% Within Birth order	89.7%	10.3%	100.0%
	3	Count	40	1	41
		% Within Birth order	97.6%	2.4%	100.0%
	4	Count	0	2	2
		% Within Birth order	.0%	100.0%	100.0%
	5	Count	2	0	2
		% Within Birth order	100.0%	.0%	100.0%
Total		Count	323	27	350
		% Within Birth order	92.3%	7.7%	100.0%

			Formula feed		Total
			No	Yes	
Birth order	1	Count	176	22	198
		% Within Birth order	89%	11%	100.0%
	2	Count	102	5	107
		% Within Birth order	95.6%	4.6%	100.0%
	3	Count	41	0	41
		% Within Birth order	100%	0%	100.0%
	4	Count	2	0	2
		% Within Birth order	.0%	100.0%	100.0%
	5	Count	2	0	2
		% Within Birth order	100.0%	.0%	100.0%
Total		Count	323	27	350
		% Within Birth order	92.3%	7.7%	100.0%

Similarly, the place of delivery had a significant relationship in the knowledge of mothers. It is attributed to the follow up advice given during discharge at various levels of health care.

Table 8: With respect to place of delivery

			Delivery Place					Total
			Tertiary	GH	PHC	Private	Home	
Advice	No	Count	25	10	10	1	0	46
		% Within Advice	54.3%	21.7%	21.7%	2.2%	.0%	100.0%
		% Within delivery place	9.0%	43.5%	25.6%	12.5%	.0%	13.1%
	Yes	Count	254	13	29	7	1	304
		% Within Advice	83.6%	4.3%	9.5%	2.3%	.3%	100.0%
		% Within delivery place	91.0%	56.5%	74.4%	87.5%	100.0%	86.9%
Total		Count	279	23	39	8	1	350
		% Within Advice	79.7%	6.6%	11.1%	2.3%	.3%	100.0%
		% Within delivery place	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

DISCUSSION

A proper feeding and child rearing practices had been always an important aspect of community medicine. A healthy and proper practices of feeding child ensure the health of the growing infant in the community. Our study has revealed that there is a prevalence rate of 7.7% in cow milk ingestion and 7.7% in formula feeds. The values do correspond to the result of usage of formula feed usage (7.7%) and that of cow's milk (10.8%) which is low as pre-lacteal feed in the study by *Nithin et al*., but less compared to the other Indian studies by *Srivatsa et al*., which is 13.5% [16, 17]. These

feeds were used as a substitute for breast milk as primary complaint among the user was insufficient milk secretion. There are various factors that are associated with insufficient milk secretion and delay of lactation [18]. Most mothers stated that it was their emotional tendency that made them to push them to use these feeds (cow milk and formula feeds) for their hungry crying infant stating that it prevented them from doing the appropriate thing. Only a very mothers knew about the disadvantages of using these feeds, others had no clue about it. Usage of cow's milk was not associated with maternal education, but usage of formula feeds indeed had a considerable relationship to that of mother's education among primi mothers. This can be attributed to the awareness created among mothers to seek help of medical professionals for the proper usage and feed practice using it in these cases. Mostly, formula feeds were given as an alternative only for specific medical conditions under the guidance of health professionals.

24.5% of the mothers stated the usage of other pre-lacteal feeds like gripe water, vasambu, honey etc. In total, the usage of pre-lacteal feeds accounts for 40%, which is higher than the studies which showed 33.5% (Nithin *et al*.,) and 22% (Madhu *et al*.,). But is relatively lower than other studies 67.3% (Raghavendra *et al*.,), 61% (Raval *et al*.,), 78.5% (Das *et al*.,), 87.9% (Srivatsa *et al*.,) [16, 17, 19, 20, 21]. These studies suggest that there was higher usage of pre-lacteal feeds compared to that of our study. It was further asked for the role of family members in usage of these other pre-lacteal feeds. To the surprise, it was not the mother's ignorance that led to the usage of other pre-lacteal feeds in these group of people but the peer pressure and beliefs of the elders that had a role. A few elderly people, especially grandmothers (3.1%) openly admitted the usage of these feeds like gripe water, vasambu, oil would be good for the infant and are also responsible for early complementary feed initiation or weaning. So, it would be right to conclude that usage of these feeds is not only attributed to the mother's knowledge of breastfeeding practices but also by the family members and care takers. So, for better outcomes, enriching knowledge of these social groups, at least to the bare minimum, is essential. This can be carried out during antenatal check-ups and postnatal visits.

A group of mothers (14.3%) reported that AN visit had certainly improved their knowledge of breastfeeding practices. With the programees for the breastfeeding week, mothers of newborn had reported that it certainly benefited them. These activities have certainly benefitted the mother on the attitude, practice, and knowledge of breastfeeding. In our study, paternal education had no role play with that of feeding practice by the mothers compared to another study which showed that, in first time mothers and their newborn, paternal education was independently associated with breastfeeding initiation and duration [22].

Our data coincided with NFHS-5 data on the percentage of institutional delivery [23]. This increase in institutional delivery has facilitated follow-up advice to a great extent. Although the rates of exclusive breastfeeding were low, institutional delivery has enabled them to increase comparatively. The place of delivery had a significant effect on the practices.

Results showed that practices changed in mothers with respect to the place of delivery. This is attributed to the kind of support given by the medical professionals at the highest level (tertiary care centre). Most of the mothers felt it was essential to initiate as soon as possible. 36% initiated breast- feeding within half an hour of birth, which is like that of the study by *Nithin et al*., [16]. 47.1% initiated within one hour of birth. The values are low compared to those of NFHS-5 [23].

The maternal complications like ICU admission, Lower uterine segment caesarean and fetal complications needing ICU admission, both these factors too play an important role in early initiation of breast feeding [24]. 68.5% had feed their infants with colostrum in some form like expressed milk, although 88% were aware of colostrum and felt it was essential to feed it. This is also attributed to the factors in delay in lactation like ICU admission of the mother, maternal complications during delivery, and fetal complications which led to immediate ICU admission [24, 25].

An increase in parity had a significant influence on practices. Literacy of mother did not influence it, contradicting to that of the study by *Kishore et al*., [26]. This increase in parity in association with practices had to be attributed to the knowledge gained due to repeated advices during subsequent pregnancy in the form of antenatal visits, during discharge and post-natal visits.

Our study has shown that very few are given follow-up advice after delivery at the smallest unit of our medical framework. A few factors which cause the need to refer to a higher centre can be attributed to it. But still, being a first place to visit in a rural setup, there is a need to strengthen them. The role played by the medical professional is of great importance. There is currently a need to use a better technique to be used for imparting and inculcating a better part. The right tool used can bring out a great outcome as these serve as a very effective medium in propagating the knowledge and values. Moreover, there is a need for a government programme to monitor or keep a check for the use of these feeds.

CONCLUSION

The study suggests, there is a need strengthening of ideas and propagation of knowledge which would bring down these practices. It is evident that the place of follow-up advice during discharge has a significant role and with increase in parity has obviously resulted in lesser usage of these feeds, strengthening the awareness and knowledge among primi mothers along

with the need for educating of the family members especially elders of the family towards breastfeeding through a multi-disciplinary approach and need for a government programme which would make it possible right from the roots of our medical system.

THE FOLLOWING TOPIC

1. Cohort on the knowledge, attitude and practice towards breastfeeding by the elders.
2. Role of multi-disciplinary approach and government programme in breastfeeding.

SUMMARY

Our study concludes the following:

1. There is still a significant percentage of mothers using cow' milk and formula feeds (7.7% and 7.7% respectively).
2. Usage other pre-lacteal feeds like gripe water, vasambu, honey e.tc., constitutes 24.5%.
3. Association of maternal education and feeding practice among primi mothers who were using formula feeds.
4. Association parity with respect to feeding practice.
5. Influence of place delivery to that of feeding practice with regards to follow-up advice.

IT ALSO SUGGESTS THAT

1. Need for a multi-disciplinary approach in educating the family members especially the elders.
2. Intensive strengthening of ideas and reinforcement of knowledge on right feeding practices at the level of PHC during ante-natal visit for mothers.
3. Need for a government programme in strengthening the values and ideas regarding breastfeeding.
4. Programme for sharing of experience and knowledge at village levels through volunteer mother.

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