

## Original Articles

# Feeding Practices of Sick Newborns Admitted in Neonatal Ward of ICMH: Breast Milk as the Only Food

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### Abstract

*Background:* Breast milk is uniquely adopted most appropriate natural, preferred food for all infants including premature and sick newborns. It protects babies against many diseases and infections, better intelligence and greater academic achievement, lower risk for developing recurrent wheezing than children who were infant-formula fed.

*Objectives:* The objective of the study is to see how early breast feeding could be started and when exclusive breast feeding could be established in admitted sick newborn.

*Materials and methods:* This was an observational prospective study through a structured questionnaire conducted in Neonatal ward of Institute of Child and Mother Health. One hundred and sixty three sick newborns admitted in neonatal ward during November, 2005 to January, 2006 with weight more than 1200 gm, gestational age more than 32 weeks without major congenital anomaly were studied. Admitted babies were kept nil by mouth or nasogastric tube feeding and/or oral feeding as clinical condition permitted. Parenteral fluid was started as recommended daily fluid and gradually was advanced to oral or nasogastric tube feeding or spoon feeding of expressed breast milk as 1 to 3 hourly feeding which was individualized. During hospital stay, mothers were encouraged and motivated to breast feed and/or to expression of breast milk. Patients discharged when full breast feeding was established. Daily weight measurement and follow up were done after 7, 15, 30 days of discharge.

*Results:* Among 330 admitted neonates, 163 were enrolled in this study. Mean age at presentation was 2.8 days. About one third of babies 55 (33.7%) had appropriate birth weight, seventy eight (47.8%) had perinatal asphyxia, and one third 55 (33.7%) had septicemia. Mean age of 1<sup>st</sup> feed was 2.9 days. Minimal and maximal days for initiation of breast feeding were 1<sup>st</sup> and 24<sup>th</sup> day respectively. Mean days of full feeding was 3.6 days. About 67 (41%) of babies received and tolerated 1<sup>st</sup> feeding in between 24-72 hours and 48 babies (29.5%) in between 3<sup>rd</sup>-5<sup>th</sup> day.

Out of 163 patients, weight gained in 22 (13%) babies during hospital stay. Average weight gain was 10 gram/day. Ninety two (55%) of study neonates needed assisted feeding with nasogastric tube. In spite of sickness breast feeding could be started in 22 (13.5%) neonates. Full feeding was established on 1<sup>st</sup> day in 44 (27%) of study neonates and in 80 (49%) neonates full feeding was established by 10 days. Expressed breast milk was from beginning in 66 (70%) of neonate.

One hundred and thirty six neonates (83.4%) came for 1<sup>st</sup> follow up, 110 (67%) came for 2<sup>nd</sup> follow up, 144 (88%) babies came for 3<sup>rd</sup> follow up. Weight gain were found in 85%, 63.8%, 82% respectively.

*Conclusion:* We can say from the present study that breast milk either by suckling or through nasogastric tube can safely be given to sick neonates under supervision and by that baby can maintained on normal weight gain.

**Key words:** Feeding practice, sick neonates, breast milk.

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### Introduction

Breast milk is the perfect food for healthy and sick baby. The unique properties of human milk make it the only nutrition of the human infant<sup>1</sup>. Adequate nutrition by breast milk in preterm newborn is not only to have satisfactory weight gain, but also to decrease

the morbidity and mortality rates in the early months of life as well as in the neonatal period<sup>1,2</sup>. Presence of anti-infective factors has been linked to a decrease in the incidence of diarrhea among preterm infant fed only human milk<sup>3</sup>. Preterm low birth weight baby fed preterm donated milk, then formula have less chance of necrotizing enterocolitis, less sepsis and better IQ<sup>1-3</sup>.

Introduction of small enteral feeds early in life has been found to improve gut function, accelerate the transition time, less time under phototherapy, low incidence of direct hyperbilirubinaemia, small gastric residual and less feeding intolerance, faster weight gain, shorter hospital stay and no increased incidence of necrotizing enterocolitis, short term immunological advantages, long term health benefits, and also provide opportunities practices that enhance the oral motor skills necessary for safe and successful feeding in all neonate including VLBW babies<sup>1,4-10</sup>. Nutritional intake by breast milk in sick VLBW infants can be improved without increasing the risk of clinical or metabolic sequelae<sup>7</sup>. Necrotizing enterocolitis is three times more in babies who received no breast milk as those who received breast milk and formula and six to ten times more in those who is only formula feed infants<sup>11</sup>. Appropriate feeding advice for proper nutrition as well as immunological protection of preterm VLBW infant from beginning of the life can help to reduce the mortality and morbidity. Despite the known value of breast feeding, there is little research on the current breastfeeding status in hospitalized neonates. Considering the enormous benefits of breast milk, we planned to give only breast milk to our patients who were admitted in neonatal ward. The objectives of the study was to see how early breast feeding could be started in sick neonate, whether exclusive breastfeeding possible in the hospital, how early exclusive breast feeding could be established in admitted sick neonate and to see the growth of the babies after discharge with exclusive breast feeding.

### Materials and Methods

This was an observational prospective study conducted in Neonatal ward of Institute of Child and Mother Health. Sick newborn babies admitted in neonatal ward during the period of November, 2005 to January, 2006 who were delivered at ICMH or out born, those weight more than 1200 gm, gestational age more than 32 weeks and admitted in hospital for a minimal period of three days after initiation of feeding were included

in this study. Those babies who had major congenital anomaly, died during hospital stay, admitted to hospital less than 72 hours and those who did not to come for follow up, and those who came from long distance had been excluded.

A structured questionnaire contained information regarding demographic data, detailed feeding history before, during and after hospitalization, presenting problems and treatment given. The questionnaire were assessed by several paediatricians. Then it was revised and finally used for study by the principal investigator.

Weight of all babies was taken by standard electronic weighing machine with 10 gram variation. Admitted babies were kept nil by mouth or nasogastric tube feeding and/or oral feeding as clinical condition permitted. Reason for withholding enteral feeding was birth asphyxia, severe respiratory distress, repeated convulsion and abdominal distention with sluggish bowel sound and sepsis. Parenteral fluid was started as recommended daily fluid and gradually advances to oral or nasogastric tube feeding or spoon feeding of expressed breast milk as 1 to 3 hourly feeding which was individualized. When mother was separated from the baby then expressed breast milk was collected from other mother in ward or from lactation management centre. During the hospital stay, position and attachment checked, mother encouraged and motivated to provide breast feeding or helped for expression of breast milk. There was continuous counseling and support to the mother and demonstration of optimum position and attachment by doctors, nurses, and ward in charge. If any problems develop after starting of feeding as manifested by abdominal distention, repeated vomiting, increased respiratory distress following feeding, then feeding was stopped for time being. When condition improved, breast milk was started gradually and slowly as tropic feed and increased gradually from partial to full breast feeding. Daily increment of enteral feeding were not more than 20ml/kg considering patients clinical status. Patients were discharged when full breast feeding was established.

Daily weight measurement and follow up were done after 7, 15, 30 days of discharge. Parents were counseled for follow up to hospital on day mentioned and their contact number was preserved and requested to come for follow up if they missed to come in due date.

Data were analyzed manually and it shows the number and percentage of distribution.

## Results

During the study period, total of 330 neonates were admitted. They were both inborn and out born. Out of them 163 neonate were enrolled in the study. Most of the deliveries (70.5%) were by normal vaginal delivery, 48(29.5%) were by LUCS. Among 163 babies, about 96(60%) were male and rest female. Mean age at presentation was 2.8 days. Seventy four (45.3%) babies were admitted on 1<sup>st</sup> day, 52 (31.9%) were on 2-7 days, 37 (22.8%) were more than 7 days of age. About one third of the baby 56 (34.4%) in the study group were born preterm, rest were born term. Mean weight on admission were 2400gm Minimal weight was 1200gm and maximum weight was 4000gm. One third of the babies 55 (33.7%) weight were more than 2500 gram and 42 (25.8%) were between 2000-2499 gm, 44 (27.0%) in 1500-1999 gm and 22(13.5%) were less than 1500gm. That is, about two third of the baby was low birth weight (Table-I). About half of the mothers 68 (48.7%) were in age between 18-30 years, one fourth 42 (25.6%) were in between 30-34 years, 38 (23.4%) mother were less than 18 years and 15(9.2%) were above 35 years (Table-II). About less then half 63 (38.65%) of the studied babies received prelacteal feed before admission. 61(37.5%) babies were exclusively breast feed. Among them 35 (52.5%) babies allowed to continue breast feeding on admission and rest kept in feeding hold for illness. 23.8% of admitted babies received mixed feed in the form of breast milk along with infant milk, cows milk, sugar water, mistry water and mastered oil before admission (Fig.-1). Most of the neonate (47.8%) had perinatal asphyxia, and one third 55 (33.74%) had septicaemia, another one third had preterm LBW and one fifth had neonatal jaundice. Others include meconium aspiration (2), congenital heart disease (2), cellulitis (3), ecthioma gangrenosum (1) Transient trachypnoea newborn (TTN) (2), Down syndrome (1), laringomalacea (1) (Table-III). Table-IV shows about 34 (20.9%) babies received 1<sup>st</sup> feeding within 24 hours of birth. Mean age of 1<sup>st</sup> feed was 2.9 days. Minimal age on starting of 1<sup>st</sup> feed was 1<sup>st</sup> day and maximal age was 24<sup>th</sup> day. About 67(41.1%) of babies received and tolerated 1st feeding in between 24-72 hours and 48(29%) in between 3<sup>rd</sup>-5<sup>th</sup> day. Mean days of full feeding was 3.6 days. 92 (56.4%) of total admitted neonate needs assisted feeding with nasogastric tube. The amount of 1<sup>st</sup> feed was less then 5 ml in about 52 (44.4%) of babies. In spite of sickness breast feeding could be started in 13.5% of neonate by suckling. More than half of the babies need nasogastric tube feeding.

Full feeding was established in 1<sup>st</sup> day in 44 (27%) of study neonates. Another 27(17%) established full feeding within 5 days of birth. And 80(49%) of neonate established full feeding by 10 days (Fig.-2).

Table IV shows that 92(52.36%) babies required expressed breast milk. Expressed breast milk was adequate from beginning in 66(70.96%) patients. Problems developed after onset of feeding and found in 18(11.4%) babies.

Problems were abdominal distention in 8 babies, apnea in 5 babies, respiratory distress in 5 babies and per rectal bleeding in 1 baby. All the complicated babies were appropriately treated and ultimately tolerate breast milk. Out of 163 patients, weight gain occurred in 22(13%) babies during hospital stay. Average weight gain was 10 gram/day. Out of 163 babies, 136(83.4%) came for 1<sup>st</sup> follow up after 7 days of discharge, 110 (63.8%) came for 2<sup>nd</sup> follow up and 144 (88%) babies came for 3<sup>rd</sup> follow up. On 1<sup>st</sup> follow up maximum babies 136 (85%) were gaining weight on an average of 10gm /day. On 2<sup>nd</sup> follow up that 110 (63.8%) of babies were gaining weight. On 3<sup>rd</sup> follow up, 118 (82%) babies were gaining weight. The weight gain gradually increased from an average 10 gm/day to 28 gm/day from 7<sup>th</sup> day to 30<sup>th</sup> days (Fig.-3). Those babies who were not gaining weight, referred to paediatric out patient department and lactation management centre (LMC).

**Table-I**

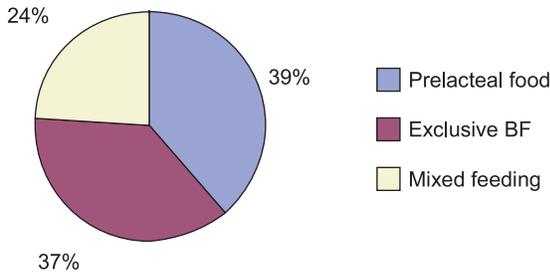
*Distribution of the babies by sex and age, gestational age and weight on admission (n=163)*

Parameter	Number	Percentage
Male	96	58.9
Female	67	41.1
Age on admission		
Day 1	74	45.3
Day 2-7	52	31.9
More than 7 day	37	22.8
Gestational age		
Preterm	56	34.4
Term	107	65.6
Admission weight		
>2500gm	55	33.7
2499 – 2000gm	42	25.8
1999 – 1500gm	44	27.0
<1500gm	22	13.5

**Table-II**

*Age distribution of the mothers (n=163)*

Mother's age	Number	Percentage
>35 years	15	9.2
30-34 years	42	25.7
18-29 years	68	41.7
< 18 years	38	23.4



**Fig.-1:** Distribution of the babies by type of feeding before admission (n=163)

**Table-III**

*Distribution of the babies by category of diagnosis (n=163)*

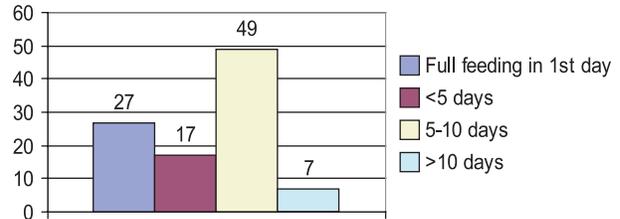
Diagnosis*	Number	Percentage
Perinatal asphyxia*	78	47.8
Septicaemia	55	33.7
Pneumonia	15	9.2
Preterm, low birth weight	56	34.9
Neonatal Jaundice	14	17.2
Others	12	7.3

\* Multiple responses

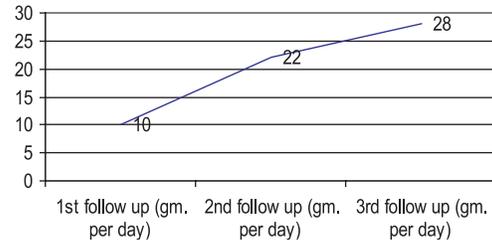
**Table-IV**

*Feeding pattern of sick babies after admission in neonatal ward (n=163)*

Parameter	Number	Percentage
<b>Time of 1<sup>st</sup> feed</b>		
Within 24 hours	34	20.9
24-72 hours	67	41.1
3 <sup>rd</sup> day -5 <sup>th</sup> day	48	29.4
More than 5 days	14	8.6
<b>Amount of 1<sup>st</sup> feeding by EBM</b>		
Less than 5ml / 2hourly	52	4.4
5 ml-10ml / 2hourly	52	44.4
More than 10ml / 2hourly	13	11.2
<b>Mode of 1st feed</b>		
Suckling	22	13.5
Nasogastric tube	92	56.4
Suckling + Nasogastric tube	49	30.1



**Fig.-2:** Percentage of babies by day of establishment of full feeding



**Fig.-3:** Average weight gain after establishment of exclusive breastfeeding

**Discussion**

The promotion, protection, support of breast feeding is utmost important for public health. In this study we found that breast milk and breast feeding can be given successfully in sick newborn and also in LBW neonate without any significant problem. We have found that in 64 (40%) of babies feeding can be started in 24-72 hours and about 34(20%) within 24 hours of admission and 149(91.5.5%) within 5 days. In a study it was found that enteral feeds as early as 2-3 days of life with parenteral nutrition especially in small preterm and sick neonate as minimal enteral feeding<sup>4</sup>. When earlier nasogastric feeding was started within 72 hours of life there is better chance of feeding tolerance<sup>4</sup>. Shirin et al. showed that time of initiation of first feeding was in 35.6% in 2<sup>nd</sup> day and in 28.7% in 3<sup>rd</sup> day and in 86.1% within 5 days of admission<sup>12</sup>. In our study we found in 56.2% babies (more than half of total) the volume of 1<sup>st</sup> feed was less than 5ml and more than 10ml was given as first feed in 13(14.4%). Feeding was well tolerated in almost all babies. In Shirin's study first feed was given less than 5ml in 71.3% and 10ml in 1% case<sup>12</sup>. Feeding could be started orally by suckling and nasogastric tube combinedly in 49 (27.2%) of neonate and 92( 56%) neonate needed nasogastric tube feeding at first feed. In our study, EBM was given via nasogastric tube in 86.36% cases and rest of the baby fed orally. It is consistent with shirin's study which showed it was 89.1%<sup>12</sup>. In Zakir's study it showed that expressed breast milk was given in 83% of cases<sup>13</sup>. In our setting we gave only breast

milk to all sick newborn. But Shirin's showed that 44.6% of babies were given breast milk in ICU and other was given artificial milk, but all 97% of babies were on breast feeding at discharge from ICU. In one study in Newzeland that 77% breast feeding rate on discharge from NICU<sup>14</sup> was found. In the present study all the babies were exclusively breastfed at discharge.

88.6% of sick babies tolerated breast milk nicely as first feed in this study. In another study 73% babies tolerate breast milk as first feed<sup>15</sup>. We found some problems after initiation of breast feeding in 11.4% of babies at first feed. Among them 12 had diagnosis of birth asphyxia with septicaemia, 8 were preterm LBW with septicaemia. Boo et al. showed that feeding intolerance in 36% of admitted babies and 10% develop NEC in VLBW baby<sup>16</sup>. None of the baby in our study developed necrotizing enterocolitis. Preterm infant fed with human milk can gain weight similar to that normally occur in utero<sup>17</sup>. Normal babies used to lose Joaquin et al. showed that weight loss is less in preterm infant fed with human milk in comparison to cow's milk<sup>3</sup>. Hylander showed that birth weight regained in 9.8 days in infant fed with human milk<sup>16</sup>. In Zakir's study it showed that birth weight regained in 12 days of age and, it was more than birth weight on 15 postnatal days<sup>13</sup>. This study revealed that early feeding in preterm VLBW infant helped minimal weight loss and regaining of birth weight earlier<sup>13</sup>.

In the present study weight gain found in 13% of cases during hospital stay. Average weight gain on first follow up after 7 days of discharge was 10gm/day, on second follow up it was 22gm/day and on third follow up 28gm/day. In a study it was found that weight gain in first month is 30 gram /day<sup>1</sup>.

### Conclusion

We can say from the present study that breast milk either by suckling or through Nasogastric tube can safely be given to sick neonates under supervision. mostly in first 24 -72 hours, with less than 5ml in most of the cases, full feeding established in less than 5 days in maximum sick neonates, expression was adequate since beginning in most cases. With exclusive breast milk. baby can maintained normal weight gain.

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