ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

THESIS MANUSCRIPT

ON

BREASTFEEDING PRACTICES AMONG MOTHERS OF BABIES ADMITTED TO NICU, TAH, ADDIS ABABA, AND FACTORS INFLUENCING PRACTICES

HAILU BERTA DEREGH, MD

PAEDIATRICIAN, FELLOW IN NEONTOLOGY

ADDIS ABABA UNIVERSTY MEDICAL FACULTY

ADVISOR: EKHARD ZIEGLER, MD

PROFESSOR AND DIRECTOR

FOMON INFANT NUTRITION UNIT

DEPARTMENT OF PEDIATRICS

UNIVERSITY OF IOWA

IOWA CITY, IOWA

UNITED STATES OF AMERICA

ABSTRACT

Background: Breastfeeding within the first hour of life is a potential mechanism for health promotion and is the basis for improved quality & quantity of milk production. The purpose of this study was to determine the prevalence of timely initiation of breastfeeding and to investigate predictors of early initiation of breast feeding among mothers of babies admitted to the Neonatal Intensive Care Unit (NICU), Tikur Anbessa Hospital, Addis Ababa, Ethiopia.

Method: A cross-sectional study was conducted involving all mothers of babies admitted to the NICU from June through September, 2012. A total of 429 mother-infant pairs were included in this study. Information about mother and baby characteristics, pregnancy, birth, and time of breastfeeding initiation was collected in the first 72 hours after delivery, through interviews with mothers and use of hospital records.The data gathered were stored and analyzed using the SPSS 20, IBM 2011. The chi-square & Kruskal-Wallis1-way ANOVA and binary logistic regression analysis were used to examine the relationship between breastfeeding within the first hour and different variables.

Results: The prevalence of timely initiation among mother-infant pairs was 13.8%; breast feeding initiation within 72 hours after delivery was 79.3%. Timely initiation of breastfeeding (initiation of breast feeding within one hour of delivery) was associated with vaginal delivery [aOR: 2.919(95%C.I: 1.185-7.189)], P = 0.02. and with term delivery [aOR: 6.26(95%C.I: 2.126-18.431)], P = 0.001.

Conclusions: In order to improve the rates of breastfeeding within the first hour of life, health care professionals and policy makers must promote the factors favoring this practice such as improving rate of vaginal delivery and full term birth, through giving emphasis on early booking and regular antenatal follow ups, early detection and correction of vulnerable situations that may lead to C/S &/or preterm birth. Prenatal education and guidance regarding the advantages of breastfeeding, and promotion of this practice in vulnerable situations such as mothers with cesarean section and preterm birth is also recommended. This study can be used as basis for further and broader study.

Acknowledgment

My deepest gratitude goes to Professor Ekhard Ziegler for his limitless help and spending his valuable time in evaluating this study. I am also very grateful to extend my appreciation to Dr. Negussie Deyessa, who helped me in statistical tests.

I extend my appreciation to all NICU staff members who participated in data collection, w/t Samrawit, who facilitated data entry. Lastly but not the least my appreciation goes to the Department of Pediatrics and Child Health for supporting me to do this study.

Table of contents III

List of tables and graphs

Lists page

Abbreviation and acronyms

A/A: Addis Ababa

ANC: antenatal care

aOR: Adjusted Odds Ratio

BF: breastfeeding

Bwt: birth weight

CI: Confidence Interval

CSA: Central Statistical Agency

C/S: Cesarean Section

EDHS: Ethiopian Demographic Health Survey

GA: gestational age

MOH: Ministry Of Health

NICU: Neonatal Intensive Care Unit

OR: Odds Ratio

PNC: Post Natal Care

SVD: Spontaneous Vertex Delivery

TAH: Tikur Anbessa Hospital

WHO: World Health Organization

Operational definitions

Breastfeeding: feeding of infant either directly on breast or expressed breast milk

Early initiation of breastfeeding: starting feeding of infant with breast milk at any time within 72hrs of postpartum period

Timely delivery: delivery at term

Timely initiation of breastfeeding: starting feeding of infant with breast milk within 1st hr of postpartum Period

INTRODUCTION

1. Statement of the problem

Although the child survival revolution of the 1980s led to a dramatic reduction in overall child mortality world wide, it had little impact on neonatal mortality. In 2002, about 4 million infants died during the 1st year of life. Neonatal deaths now account for about 36% of under 5 year mortality. Sub-Saharan Africa, including Ethiopia, contributes a high proportion of neonatal deaths, yet its progress has been slowest of any region in the world. The majority of neonatal deaths occur at home [1, 2, 3, 4].

Promotion of breastfeeding is a key component of the child survival strategy [6]. Timely initiation and exclusive breastfeeding for the 1st 6 months of life, together with appropriate complementary feeding practice, is crucial for child survival and development. If all infants are put to the breast within 1 hr of birth and are exclusively breastfed for the first 6 months of life, it is estimated that about 22% of infant deaths could be prevented [7, 37] .

The WHO recommends early and timely initiation of breast feeding and exclusive breastfeeding for the 1st 6 months of life. The numerous benefits of breast feeding accrue not only to the infant and the mother but to society in general. Along with the provision of all necessary nutrients for the growing infant, breastfeeding provides protection against various diseases such as diarrhoea, pneumonia, otitis media, meningitis, urinary tract infection and allergic diseases and confers optimal long-term health. Breast feeding also has a positive impact on the child's cognitive and behavioural development. It is also well documented that breastfeeding provides advantages to the mother and the entire family, including low cost, family planning (increased child spacing), protection against breast and cervical cancers and postpartum haemorrhage [5, 7, 9, 11-16, 21].

However, despite these known benefits of breastfeeding, a substantial proportion of mothers do not initiate breastfeeding and recently there has actually been concern about a decline in breastfeeding practice in developing countries [5].

Realizing the importance of the timely initiation of breastfeeding,the Ethiopian government has developed infantand young child feeding guidelines in 2004 with emphasis on the key messages of timely initiation of breastfeeding. Since then, breast feeding promotions have been given at healthinstitutions and at the community level by communityhealth extension workers and other health care providers.However, these efforts cannot rely on systematic data on the level of existing breast feeding practice, which is due to a paucity of data from studies on timely initiation [7, 24]. Therefore,this study triedto assess the prevalence of timely initiation of breastfeedingand associated factors among mothers in the NICU of Tikur Anbessa Hospital, Addis Ababa, Ethiopia.

2. Literature review

The effect of breast feeding on infant health and development has been discussed for more than a century. Breastfed babies are protected against diarrheal disease and other infectious diseases and have better cognitive outcomes in childhood than artificially fed babies[11,17,23]. There has been continued interest in the effect of breastfeeding on child health and survival. Many studies have shown the powerful impact of breastfeeding on child morbidity and mortality[17,18,19, 20].

Nevertheless, recent data indicate that breastfeeding initiation immediately after birth and its continuation as exclusive breastfeeding for 6 months is surprisingly low. The prevalence of timely initiation of breastfeeding in some developing countries is: Ghana 41%, Sudan 54.2%, Zambia 70%, Jordan 49.5%, Brazil 47.1%, India 41%, and Tunisia 43%[1,7,26,37]. A study in Ethiopia showed the prevalence to be 52.4% (Setegn et al., 2011). Another study in Ghana (Edmond et al., 2006) pointed out that the prevalence of initiation within 1hr, 1-24hrs, day 2, day 3 and after day 3 respectively was 43%, 28%, 20%, 7.3% and 1.3% of those who initiated breastfeeding of their babies. This is also supported by another study in Nepal (Mulanny et al., 2008), which showed initiation within 1 hr to be 3.4% and within 24 hrs 56.6% [2]. In India the timely initiation rate is, 13.6%[40]; and in Brazil, 16%.[27].

In order to understand what is causing this discouraging pattern in contemporary breastfeeding practice, despite continuous promotion and support, a number of studies have attempted to evaluate whether specific factors or groups of factors might influence breast feeding patterns. One study in Brazil (Bacolinic et al., 2011) showed that the prevalence of timelyinitiation of breastfeedingwas low among infants with intercurrent illnesses; among infants whose mothers did not have contact with them and among babies who were delivered at private hospitals[27]. Another study in Kenya, (Kimani Murage et al., 2011) showed a negative impact of marital status (non union), ethnicity and lower educational attainment on breastfeeding practice[28]. Other studies point out that certain socio-demographic factors, such as the absence of private insurance, low parity, low birth weight, and place of residence have a negative impact ontimely breastfeeding initiation and its continuation[22, 30, 31, 39].

Some researchers tried to identify predictors that are positively associated with breastfeeding practice. Systematic reviews (by Sikorski J. et al., 2003; O.Neizi et al., 1991) showed that extra support to the mother, both prenatally and postnatally, has a beneficial effect on the duration of breastfeeding[41,42]. Others reported that mothers delivering in accredited maternity units, who attended antenatal classes and/or received guidance on breastfeeding or targeted peer support had higher rates of breast feeding initiation. A positive impact on timely breast feeding initiation was also shown for birth at full term (as opposed to prematurely), vaginal delivery, companion present at delivery and also positive impact on early breast feeding initiation when there is maternity hospital stay for more than 24 hrs[7,8,10,32,34 – 37]. Finally, effective antenatal care, health professional acting as advocates, maternal knowledge, perception and experience with breastfeeding by the mother herself play important roles in the decision making to breastfed or not[10,29,33,38]. Therefore the main objective of this study was to determine the prevalence and determinant factors of initiation of breastfeeding among mothers of babies admitted to Tikur Anbessa Hospital NICU.

Methods

Study design and population

A cross – sectional study using both qualitative and quantitative methods of data collection was conductedfrom July to September 2012 in Tikur Anbessa Hospital, Addis Ababa, Ethiopia.

Ethiopia is one of the sub-Saharan African countries found at the horn of the continent; it covers an area of 1.2 mkm^{2}withapopulation of more than 73 million (Ethiopian Central Statistics Agency, 2008). About 85% of the population is rural and 15% is urban.Out of 85 different ethnic groups in the country, two (Oromo & Amhara), contribute about 62% of the population. Children below the age of 15 years and below 5 years account for 45% and 15% of the population, respectively. Population growth rate is 2.1%/yr. Infant and under 5 mortality rates are 59 and 88/1000 live births, respectively. Antenatal and delivery care by skilled personnel at health institution is low, 34% and 10% respectively [2425]. Addis Ababa is the capital city located at heart of the country covering an area of 210 km2with a population of more than 2.7 million. Though the majority of residents are from Amhara, Oromo, Tigre and Gurage, the city is inhabited by most of the ethnic groups of the countrywith more or less similar social, cultural and other related standards. There are 3 referral, 5 government and 25 private hospitals, 25 government and 5 non-government health centers and 7 government and 8 private clinics. The total annual number of deliveries at health institutions is about 32,000. Tikur Anbessa Hospital (TAH) is a tertiary teaching hospital giving all types of specialised health services to patients coming from all directions of the country. Its Neonatal Intensive Care Unit (NICU), located in close proximity to the labor and delivery area, has42 beds with about 260 monthly admissions of which more than 60% come from outside of the hospital.[25]

After approval from the institutional review board, go-ahead permission was obtained from the department of pediatrics and child health. Written informed consent was obtained from each participant mother. All mother-infant pairs admitted during the study period were included; among twins and triplets, each infant was independently included in the study. 538 mother-infant pairs were assessed for eligibility,and 429 were found to be eligible for the study. Of the remaining 109 admissions, the majority involved deaths soon after admission before the mother could be contacted; others were twins and triplets.

Data collection

Data were obtained through in-depth interviewing of mothers and by retrieving data from medical recordsusing a structured, pretested open ended questionnaire. The questionnaire was translated and contextualizedin Amharic. Mothers of babies admitted to the NICU during the study period were interviewed after 72hrs postpartum. But also mothers were interviewed within 72hrs postpartum when it was known that they had started breastfeeding and were ready for discharge before 72hrs postpartum. Collected data includedboth qualitative and quantitative variables, regarding socio-demographic characteristics of both mother and baby such as age, address, marital status, educational and religious status, income, infant sex, gestational age and birth weight; obstetric history such as parity, antenatal care, place and breastfeeding classes, mode and place of delivery; breastfeeding assessment including timing of initiation of breastfeeding directly on the breast or with expressed milk, maternal prior breast feeding experience, maternal perception of breastfeeding . Data were collected by well trainedNursesin the NICU with close monitoring by the principal investigator.

Data analysis

After completeness and consistency were checked, data were entered, coded, recoded, cleaned and analysed using data base software package SPSS for windows version 20 (IBM SPSS statistics version 20). Descriptive statistics were computed to determine the prevalence of timely initiation of breastfeeding. Proportions of timely initiation of breast feeding were compared using Chi-square tests. First a bivariate logistic regression was performed. Variables that showed significant association with timely initiation of breastfeeding in the bivariate models were entered in a multivariable logistic model. To identify independent predictors of timely initiation of breastfeeding, a multivariable logistic regression model with timely initiation of breast feeding as dependent variable was constructed. All tests were two-sided and a $P < 0.05$ was considered statistically significant. The results are presented as proportions, results of the logistic regression as Odds Ratios (OR) with 95% Confidence Intervals.

Results

The mean (± SD) age of mothers was 26.9 (±5.2) years with minimum and maximum ages being 18 and 50 years. Most mothers (48.7%) were in the age group of 25-30 years. Four hundred five (94.4%) mothers were married and 368 (85.8%) had formal education ranging from first grade to college degrees. Two hundred ten (49%) mothers were housewives and 120 (28%) were participating in some form of private business. Most mothers (63.2%) were Orthodox Christians followed by Muslims (23.1%). One hundred fifty five (36.1%) mothers were from Amhara while 123 (28.7%) were Oromo ethnic group. Tigre, Guragie and other ethnic groups contributed the rest (35.2%). Most mothers (80.2%) were residents of Addis Ababa and 19.8% were from other cities and rural areas(Table 1).

For 242 (56.4%) mothers this was the first baby while the rest of the mothers had one or more children before. The majority of mothers, 418 (97.4%), attended antenatal visits at least once during their current pregnancy; of them, 318 (76.1%)) had four or more visits. Most antenatal attendances (48.6%) were at health centers; 45.5% prenatal visits were staffed by physicians and 54.5% by non-physician health workers. Four hundred eighty (97.4%) mothers delivered at health institutions.66% of mothers delivered by spontaneous vaginal delivery (SVD) while 34% delivered by cesarean section (C/S). Mean gestational age at delivery was 36.8 weeks (±3.5) and 66% of babies were born at 37 or more completed weeks while the rest (34%) were born preterm. Male gender accounted for 60.1% and female for 39.9% Mean birth weight was 2592gms (±784.6), with the lowest being 945gms and the highest 5070gms. Two hundred forty six newborns (57.3%) had a birth weight of 2500gms or more while the rest 42.7% had low birth weight. Table-2& 3.

One hundred twenty seven (29.7%) mothers had experienced breast feeding at least once before and165 (38.5%) received some form of breast feeding counseling at least once during the antenatal or postnatal period. Most mothers 387(90.2%) believed that breast milk is the preferred feed for their newborn, while 31(7.2%) mothers preferred either formula or cow's milk, but 11(2.6%) had no opinion on what type of feeding is preferable. Three hundred forty (79.3%) mothers started breast milk feeding and the rest 89(20.7%) did not start breast feeding until they were interviewed.

Among mothers who started breast feeding, 59 (17.4%) started within 1hr of delivery (this is 13.8% of all mother-infant pairs), 39% started between 1 and 24hrs, and 62.6% between 24 and 72hrs. Thus, a full 281(82.6%) of breastfeeding mothers started breast feeding after 1hr of age (table 4 & figure 1). Mothers who started breast feeding late (>72 hours) said that they couldn't start early because they were at a different hospital or were too sick (124 =44.1%), or the baby was sick (68 =24.2%) or the baby was premature/ low birth weight (13=4.6%) or her breasts didn't start to produce milk (40=14.2%). About thirteen percent (12.8%) of mothers didnot knowthat the time of starting matters. Among mothers who started breast feeding late or didn't start at all, only 20 (5.4%) expressed their breasts and all of them discarded the expressed milk.

The reason why they discarded was not assessed. Of these 20 mothers who expressed their breasts, nine (45%) did so within 72hrs and the remaining 11 after 72hrs from delivery. Table-5

Table -1, Socio-Demographic characteristics of mothersn = 429

Socio-Demographic variables	Catagories	N	%
Age (years)	<=18	13	3
	19-24	131	30.5
	25-30	209	48.7
	31+	76	17.7
Marital status	Single	22	5.1
	Married	405	94.4
	Other	2	0.5
Education	Illiterate	61	14.2
	Elementary (1-8)	123	28.7
	Secondary+(9+)	245	57.1
Occupation	Housewife	210	49
	Employed	77	17.9
	Private business	120	28
	Others	22	5.1
Religion	Orthodox	271	63.2
	Muslim	99	23.1
	Others	59	13.8
Ethnicity	Oromo	123	28.7
	Amhara	155	36.1
	Others	151	35.2
Monthly family income	<1000Eth	80	18.6
	1000-3000Eth	249	58
	>3000Eth	100	23.3
Address	Addis Ababa	344	80.2
	Outside Addis Ababa	85	19.8

Table-2, Obstetric and health related factors of mothers

	Categories	N	%
Gravidity	1 2 3+	194 121 114	45.2 28.2 26.6
Parity	1 2+	242 187	56.4 43.6
No. of other living children	0 1+	247 182	57.6 42.5
Attendance of Antenatal care	Yes No	418 11	97.4 2.6
No. of antenatalvisits	< 4 4+	100 318	23.9 76.1
Place of attendance	Gov.hospital Priv. hosp Health center Other	92 122 203 1	22 29.2 48.6 0.2
Antenatal care provider	Physician Nurse/midwife other	190 225 3	45,5 53.8 0.7
Place of delivery	Gov. hosp Priv. hosp Health center others	221 107 90 11	51.5 24.9 21 2.6
Mode of delivery	SVD C/S	283 146	66 34

Table -3: Characteristics of infants n = 429

	Categories	N	%
Birth weight	<1000gm 1000gm-1499gm 1500gm-2499gm 2500gm+	4 42 137 246	1 9.8 31.9 57.3
Sex	Male Female	258 171	60.1 39.9
Gestational age	<28weeks 28-<34wks 34-<37wks >=37wks	5 68 73 283	1.2 15.9 17 66

Table - 4 Time of initiation of breast feeding in n = 429

Timeof initiation (hrs)	number	%
<=1	59	13.8
1< -24	108	25.2
24 – 48	59	13.8
48 – 72	42	9.8
>72	72	16.8
Not started	89	20.7

Figure -1 distribution of time of breast feeding initiation.

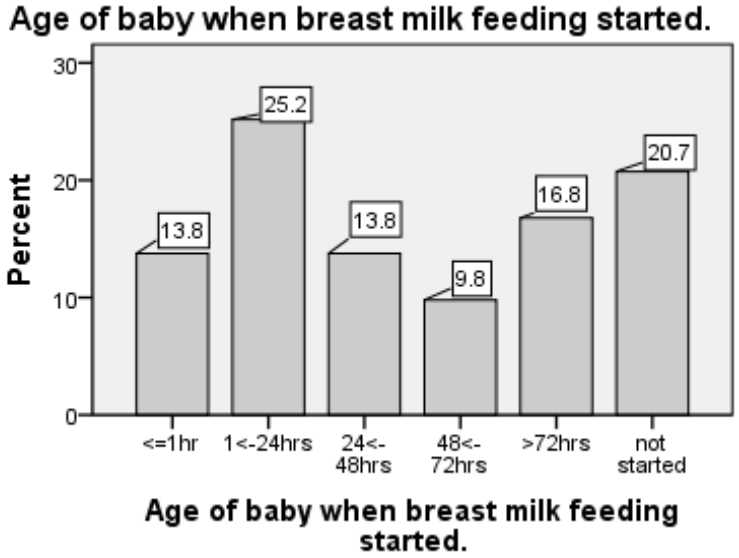

Table-5: Breast expression status among mother-infant pairs
n = 429

Breast expression	Time of first breast expression		Total	
	≤ 72hrs	>72hr	N	%
Yes	9	11	20	4.7

Early initiation of breastfeeding was significantlyassociated with family monthly income, place of delivery, mode of delivery, gestational age and birth weight of the baby. Mothers with monthly income of 1000eth up to 3000eth.were more likely toinitiate breastfeeding early as compared to mothers with lower income(22% and 10% of mothers, respectively(P =0.025). Among the factors related to breast feeding, place and mode of delivery, the infant's gestational age and birth weight were significantly associated with timely initiation ofbreastfeeding (Table 6 & 7).

Mothers who had monthly income of 1000 – 3000Eth. were about 39% more likely to initiatebreastfeeding within the first hour of delivery than mothers with monthly income less than 1000Eth. [OR: 0.394(95%C.I:0.159-0.976)]. But this relationship was not present among the small group of mothers who had a monthly income of more than 3000eth. [OR: 0.877(95%C.I:0.294-2.612)].

Mothers who delivered at health centers were 21% more likely to initiate breast feeding in a timely fashion than mothers who delivered in hospital [OR: 0.214(95%C.I:0.109-0.420)]. Similarly, those who delivered bynormal vaginal delivery were 3.6 times more likely to practice timely initiation ofbreastfeeding compared to mothers who delivered by cesarean section [OR: 3.58(95%C.I:1.63-7.84]. Mothers who delivered term babies were 4.7 times more likely to initiate breastfeeding within the first hour compared to mothers who gave birth to preterm babies, [OR: 4.657(95%C.I:1.933-11.219].Also, mothers who delivered babies with normal birth weight were 1.9 times more likely to initiate breastfeeding within the first hour after delivery compared to those who had newborns with low birth weight [OR: 1.917(95%C.I:1.030-3.568)]
(Table 8).

Multivariableregression analysis revealed that after adjusting for other variablesin the model, mode of delivery and gestational age of the infant were independent predictors oftimely initiation of breastfeeding. Accordingly, mothers who delivered by SVD were 3 times more likely to initiate breast feeding within the first hours of delivery than those who delivered by C/S [aOR: 2.919(95%C.I: 1.185-7.189)], P = 0.02. Similarly, mothers who delivered at term were 6.3 times more likely to initiate breast feeding in a timely fashion than mothers who delivered preterm babies [aOR: 6.26(95%C.I: 2.126-18.431)], P = 0.001. Table 9

Discussion

This study tried to determine the prevalence oftimely initiation of breast feeding and assessed factors associated with this practice. Overall, the prevalence of breast feeding initiation among the mother-infant pairs within the first 72hrs after delivery was 79.3%. This value is lower than the breast feeding rate of the country, Addis Ababa and of the Oromia region, which were 96%, 93%, and 98.7%, respectively[7, 24]. The low prevalence reflects the fact that a high percentage of deliveries were high-risk deliveries. Increased risk is known to interfere with breast feeding. Furthermore, it could be attributed to mothers who had not initiated at the time of interview but might have started breastfeeding later on. Although globaland national infant and young child feeding guidelinesand the World Health Organization (WHO) recommend that all newborns should start breast feeding immediately (within the first hour of delivery) and that colostrum be given to all newborn infants, circumstances surrounding high-risk deliveries often prevent this from happening. It is well known that expressing milk early or letting the baby feed on the breast early (within 72hrs after delivery) leads to more and prolonged milk production. This study showed that of the mother –infant pairs who initiated after 1hr or did not initiate until they were interviewed, 5.4% expressed their breast. But, surprisingly, all of them discarded the expressed milk. It was not the aim of this study, but it would have been helpful to assess the reason why mothers discarded the milk. Knowing the reason might be helpful in designing improved breast feeding strategies.

Timely initiation of breast feeding among mother-infant pairs was 13.8%, (17.4% of those who started breast feeding within 72hrs). This value is better than that in a study done in Nepal (3.4%) but similar to studies done in India (13.6%) and Brazil (16%)[40, 27]. In contrast, it was much lower than breast feeding practice seen in different parts of Ethiopia, 60% in Amhara, 50% in Southern Nations nationality & people's region (SNNPR), 52.4% in Oromia region. This difference could be explained by the fact that the studies were done in different settings than the present study. These studies were done within communities where the majority of mothers were from rural areas and deliveries were predominantly normal and took place at home. In addition, studies were undertaken at any time after delivery. For example, a study in Oromia region (Setegn et al, year) was done within one year of delivery which might be subject to recall bias. Similarly, timely

initiation of breast feeding in the current study was lower than in studies done in other countries; 41% in Ghana, 54% in Sudan, 49.5% in Jordan, 43% in Tunisia[1, 26,37].

Binary logistic regression analysis showed that there was no difference in timely initiation of breastfeeding by maternal demographic factors, health related factors or obstetric factors. In contrast to the previous study in Oromia by Setegn et al. 2011, the presence of breast feeding counseling of the mother antenatally or after delivery was not associated with timely initiation of breast feeding. The quality, frequency or duration of breast feeding sessions were not assessed in the present study but could have affected the outcome. Place and mode of delivery, gestational age and birth weight of infants were associated with timely initiation of breast feeding. After adjustingthe model for other factors, multinomial logistic regression showed that mode of delivery and gestational age were independent factors affecting the prevalence of timely initiation of breast feeding. Mothers delivering by spontaneous vaginal delivery were 3 times more likely to initiate breast feeding than mothers who were delivered by Cesarean section, aOR: 2.919, 95%CI: 1.185-7.189,Pv = 0.02. Similarly, mothers who delivered term babies were 6-times more likely to initiate breast feeding within 1hr after delivery than mothers delivering preterm babies, aOR: 6.26, 95%CI: 2.126-18.431, Pv = 0.001. These results are consistent with two other studies in Brazil which were done in mother-infant pairs in hospital settings within 72hrs of delivery[27, 37].

Quantitative and qualitative methods of data collection directly from mothers using an in-depth questionnaire, as well asuse of newborn hospital chartswere the strengths of the present study. Another strength of the study was that mothers were interviewed within 72hrs of delivery, making it not subjected to recall bias. On the other hand, this study used a cross sectional design in an urban setting; it is difficult to establish causal associations and generalize to the population at large.Since the objective of this study was to assess the extent of the timely initiation of breast feeding and factorsassociated with it, it was not possible, for example, to determinereasons behind expressing & discarding first milk (colostrum), which would be important information for designing breast feeding promotions.

Conclusion

The study showed that the prevalence of timely initiationof breastfeeding was low in this high-risk population. Expression of breasts among mothers who did not initiate breast feeding early was very low. Furthermore, all of the expressed colostrum was discarded. Modes of delivery and gestational age of newborns at delivery are associatedwith timely initiation of breastfeeding. These factorsshould be taken intoaccount in designing an intervention study. Intervention measures are needed to increase the prevalenceof breastfeeding initiation within the first hour of life. These measures should be started during the prenatal period,with the development of educational actions that placevalue on and clarify the advantages of breastfeeding withinthe first hour of life, thereby arousing the willingness and good intentions among mothers, with regard to placing thebaby on the breast immediately after birth. Willingnessamong healthcare professionals is also needed, with regardto supporting and helping mothers in situations of vulnerabilitythat cause delays in the first breastfeeding, such ascesarean delivery and prematurity.

Table 6: Breastfeeding initiation by socio-demographic characteristics of mothers
n = 340

Socio – demographic variable	Category	Initiation of breast feeding		p-value
		<=1hr N (%)	>1hr N (%)	
Age of mother (yrs)				
<=18		2 (18.2)	9 (81.8)	0.225
19-24		23 (22.5)	79 (77.5)	
25-30		28 (16.9)	138 (83.1)	
31+		6 (9.8)	55 (90.2)	
Education				
Illiterate		7 (15.9)	37 (84.1)	0.921
	Elementary	18 (18.8)	78 (81.2)	
	Secondary +	34 (17)	166 (83)	
Marital status				
Single		2 (12.5)	14 (87.5)	0.779
	Married	57 (17.7)	265 (82.3)	
	Others £	0	2 (100)	
Occupation				
Housewife		33 (19.6)	135 (80.4)	0.303
	Employed	9 (14.9)	52 (85.2)	
	Private business	15 (16)	79 (84)	
	Others	2 (11.8)	15 (88.2)	
Ethnicity				
Oromo		15 (14.3)	90 (85.7)	0.688
	Amhara	25 (20.8)	95 (79.2)	
	Others	19 (16.5)	96 (83.5)	
Religion				
Orthodox Christian		39 (18.6)	171 (81.4)	0.574
	Muslim	14 (17.3)	67 (82.7)	
	Others	6 (12.2)	43 (87.8)	
Family income (Eth./mon)				
<1000		6 (10)	54 (90)	0.025
	1000 – 3000	44 (22)	156 (78)	
> 3000		9 (11.2)	71 (88.8)	
Residence				
Addis Ababa		47 (17.3)	225 (82.7)	0.943
	Outside Addis	12 (17.6)	56 (82.4)	
Infant sex				
Male		42 (19.9)	169 (80.1)	0.113
female		17(13.2)	112 (86.8)	
Birth weight (gms)				
<2500		16 (12)	117 (88)	0.038
≥ 2500		43(20.8)	164 (79.2)	
Gestational age (weeks)				
< 37		6 (5.8)	97 (94.2)	< 0.001
≥ 37		53 (22.4)	184 (77.6)	

£ = widowed, divorced

Table 7: Comparison of breastfeeding initiation by obstetric and health service related factors

. n = 340

Socio – demographic variable	Category	Initiation of breast feeding <=1hr N (%)	Initiation of breast feeding >1hr N (%)	p-value
Gravidity				
	1	26 (17.4)	123 (82.6)	0.474
	2	22 (21.8)	79 (78.2)	
	3+	11 (12.2)	79 (87.81)	
Parity				
	1	29 (15.8)	155 (84.2)	0.401
	2+	30 (19.2)	126 (80.8)	
ANC visit				
	yes	58(17.6)	272 (82.4)	1.00®
	no	1 (10)	9 (90)	
No of ANC visit <4		9 (12.2)	65 (87.8)	0.167
	4+	4 9 (14.9)	207 (80.9)	
Place of visit				
	Gov. Hospital	15 (19.5)	62 (80.5)	
	Private Hospital	11(11.6)	84 (88.4)	0.40
	Health Centre	32 (20.6)	125 (80.2)	
	Others	0	1(100)	
ANC Provider				
	Physician	22 (14.8)	127 (85.2)	0.284
	Non physician	36 (19.9)	145 (80.1)	
Place of delivery				
	Gov. Hospital	18 (10.3)	156 (89.7)	0.078
	Private Hospital	12 (14.8)	69 (85.2)	
	Health Centre	27 (35.1)	50 (64.9)	
	Others €	2 (25)	6 (75)	
Mode of delivery				
	SVD	51 (22.1)	180 (77.9)	0.001
	C/S	8 (7.3)	101 (92.7)	
Prior experience on breastfeeding				
	Yes	19 (17.9)	87 (82.1)	0.852
	No	40 (17.1)	194 (82.9)	
Presence of counseling on breast feeding (ANC/PNC)				
	Yes	25 (18.5)	110 (81.5)	0.753
	No	34 (16.8)	171 (83.2)	
Preference of mother on Type of milk to feed baby				
	Human breast milk	58 (18.4)	257 (81.6)	0.08
	Formula/ cow's milk	1 (5.3)	18 (94.7)	
	Not sure	0	6(100)	

® = Exact fisher test ; € = home or on the way

Table -8: Bivariate and multivariate logistic regression to show those factors associated with early initiation of breastfeeding among mother – infant pairs

Variable	Initiation of breastfeeding			p-value
	≤ 1hr	>1hr		
	N (%)	N (%)	OR (95% CI)	
Family monthly income (Eth./month)				
<1000	6 (10)	54 (90)	1.00	-
1000 – 3000	44 (22)	156 (78)	0.394(0.159 – 0.976)	0.04
> 3000	9 (11.2)	71 (88.8)	0.877(0.294 – 2.612)	0.813
Mode of delivery				
SVD	51 (22.1)	180 (77.9)	3.58(1.63 – 7.84)	0.001
C/S	8 (7.3)	101 (92.7)	1.00	-
Birth weight (gms)				
<2500	16 (12)	117 (88)	0.522(0.280 – 0.971)	0.04
≥ 2500	43 (20.8)	164 (79.2)	1.00	-
Gestational age (weeks)				
< 37	6 (5.8)	97 (94.2)	1.00	-
≥ 37	53 (22.4)	184 (77.6)	4.677(1.933 – 11.219)	0.001

Table 9:Multivariate logistic regression to show those factors, associated with timely initiation of breastfeeding among mother – infant pairs after adjustment of OR for other variables.

	Initiation of breastfeeding			p-value
	≤ 1hr	>1hr		
	N (%)	N (%)	aOR (95% CI)	
Mode of delivery				
SVD	51 (22.1)	180 (77.9)	2.919(1.185 – 7.189)	0.02
C/S	8 (7.3)	101 (92.7)	1.00	-
Gestational age (weeks)				
< 37	6 (5.8)	97 (94.2)	1.00	-
≥ 37	53 (22.4)	184 (77.6)	6.26(2.126 = 18.431)	0.001

13 Appendices

1. References

1.Edmond KM, Zandoh C, Quigley MA, Amenga-Etego S, Owusu-Agyei S, Kirkwood BR. Delayed breastfeeding initiation increases risk of neonatal mortality. Pediatrics 2006;117:e380-xxx.

2. Mullany CL, Joany K, You ML, Subarna K K, Steven CL,Gary LDJames MT. : Breast-Feeding Patterns, Time to Initiation, and Mortality Riskamong Newborns in Southern Nepal; J Nutr. 2008 March ; 138(3): 599–603.

3. Lawn J, Cousens S, Zupan J. 4 million neonatal deaths: When? Where? Why? Lancet. 2005;365:891–900

4. Save the Children. State of the World's Newborns 2001. A Report From Saving Newborn Lives. Washington DC: Save the Children; 2001:1–49

5. Sherine S, Bahaa AA.: Maternal factors associated with the duration of breast feeding inJeddah, Saudi Arabia;Paediatric and Perinatal Epidemiology 2003, 17**,** 91–96

6. Jones G, Steketee RW, Black RE, Bhutta ZA, Morris SS; Bellagio; Child Survival Study Group. How many deaths can we prevent this year? Lancet. 2003;362:65–71

7. Setegn T, Gerbaba M and Tefera Belachew T: Determinants of timely initiation of breastfeeding among mothers in Goba Woreda, South East Ethiopia: A cross sectional study; BMC Public Health 2011, 11:217

8. DiGirolamo AM, Grummer-Strawn LM, Fein SB.: Effect of Maternity-Care Practices on Breastfeeding; Pediatrics 2008;122;S43 DOI: 10.1542/peds.2008-1315e

9. Ashraf RN, Jalil F, Zaman S, Karlberg J, Khan SR, Lindblad BS, Hanson LA. Breast feeding and protection against neonatal sepsis in a high risk population. Arch Dis Child 1991;66:488–90. [PubMed: 2031606]

10. Sarah Earl: factors affecting the initiation of breastfeeding : Implication for breastfeeding promotion; Health promotion international, Oxford university press,2002.

11. Fairbank L, O'Meara S, Sowden AJ,Renfrew MJ, Woolridge MM: Promoting the initiation of breast feeding; effectiveness bulletin, Quality in the health care 2001, 10, 123-127.

12. Ziegler EE. Nutrient requirements of premature infants. NestleNutr Workshop Ser Pediatr Program. 2007;59:161–172

13. Heird WC: The feeding of infant and children; Nelson text book of paediatrics; 17th edition.

14. WHO: world health report WHO; Geneva, 2003.

15. WHO: Standards for maternal, neonatal care; WHO; Geneva, 2006.

16. WHO: world health statistics; WHO; Geneva, 2008.

17. De Zoysa I., Rea M. & Martines J. (1991) Why promote breastfeedingin diarrheal disease control programmes. Health Policy Plan. 6: 371–379.

18. Cunningham AS., Jelliffe D B. & Jelliffe EFB. (1991): Breast- feeding and health in the 1980's: a global epidemiologic review. J. Pediatr. 118: 659–666.

19. Newman, J. (1995) How breast milk protects newborns. Sci. Am. 273: 76–79.

20.Daniel W. Sellen: Comparison of Infant Feeding Patterns Reported for NonindustrialPopulations with Current Recommendations; journal of Nutrition, pooled revision, 2001

21. World Health Organization (WHO): The optimal duration of exclusive breastfeeding: Report of an expert consultation. Department of nutrition for health and development and department of child and adolescent health and development. Geneva, Switzerland; 2001.

22. Naggan L, FormantRM, Sarov B, Gillian Lewando-Hundt, ZangwilP L, Chang DS and Berendes HW: The Bedouin Infant Feeding Study: study designand factors influencing the duration of breastfeeding.
23. Oddy WH, Kendal GE, Blair E, De Klerk NH, Stanley FJ, Landau LI, Silburn S, andZubrick S: Breast feeding and cognitive development in childhood: aprospective birth cohort study
24. Ethiopian demographic health survey; preliminary 2011 health report, EDHS, 2011.
25. Central Statistical Agency (CSA); 2008 report; CSA, Ethiopia
26.SlamaFB, Avari I,OuziniF,BelhadiOAchour N: Exclusive breastfeeding and mixed feeding: knowledge, attitudes and practices of primiparous mothers. East Mediterranean health j; 2010, june,16(6):603-5.
27. Boccolini CS, De Carvalho ML, De Oliveira MIC, Vasconcellos AGG: Factors associated with breastfeeding in the first hour of life; Rev Saúde Pública 2011;45(1)
28. Elizabeth W Kimani-Murage, Nyovani J Madise, Jean-Christophe Fotso, Catherine Kyobutungi, Martin K Mutua, Tabither M Gitau and Nelly Yatich: patterns and determinants of breastfeeding and complementary feeding practices in urban informal settlements, Nairobi Kenya; BMC public health2011, 11: 396.
29. Langer A, Nigenda G, Romero M, Rojas G, Kuchaisit C, Al-Osimi M and Orozco E: for the WHO Antenatal Care Trial Research Group: Conceptual bases and methodology for theevaluation of women's and providers' perceptionof the quality of antenatal care in the WHOAntenatal Care Randomised Controlled Trial; Paediatric and Perinatal Epidemiology 1998, 12, Suppl. 2, 98±115
30. Ogbuanu CA, Probst J, Laditka SB, Liu J, Baek JD, and Glover S: Reasons why women do not initiate breastfeeding: A Southeastern State Study; NIH public access; women health issue: 2009; 19(4); 268-78
31. Kunwar S, Faridi MMA, Singh S, Zahra F, Alizaidi Z: Pattern and determinants of breast feeding and contraceptice practices among mothers within six months postpartum; BioScience Trends. 2010; 4(4):186-189.
32. Bartington S, Griffiths SJ, Tate AR, Dezateux C and the Millennium Cohort Study Child Health Group: Are breastfeeding rates higher among mothers delivering in Baby Friendly accredited maternity units in the UK? International Journal of Epidemiology 2006; 35:1178–1186; doi: 10.1093/ije/dyl155
33. Oommen A, Vasta M, Paul VK & Aggarwal R: breastfeeding Practices of Urban and Rural Mothers; Indian paediatrics; Volume 46__October 17, 2009
34. Ingram L, MacArthur C, Khalid Khan, Jonathan J. Deeks, Jolly K: Effect of antenatal peer support on breastfeeding initiation: a systematic review; CMAJ 2010. DOI:10.1503/cmaj.091729
35. Anderson AK, Damio G, Young S, et al. A randomized trial assessing the efficacyof peer counseling on exclusive breastfeeding in a predominantly Latina lowincomecommunity. Arch Pediatr Adolesc Med 2005; 159:836-41.
36. Chapman DJ, Damio G, Young S, et al. Effectiveness of breastfeeding peer counselling in a low-income, predominantly Latina population: a randomized controlledtrial. Arch Pediatr Adolesc Med 2004; 158:897-902.
37.Tatiana O Vieira, Graciete O Vieira, Giugliani ERJ, MC Mendes C, Martins CC, Silva LR: Determinants of breastfeeding initiation withinthe first hour of life in a Brazilian population:
Cross-sectional study
38. Shealy KR, Scanlon KS, Labiner-Wolfe J, Fein SB, Grummer-Strawn LM: Characteristics of Breastfeeding Practices AmongUS Mothers:paediatrics,volume 122,supplement 2, 0ctober, 2008
39.Smith MM; Durkin M; Hinton VJ; Bellinger D; Kuhn L: Initiation of Breastfeeding Among Mothers ofVery Low Birth Weight Infants; paediatrics, 2003; 111; 1337.
40. Sinhababu A, Mukhopadhyay DK, Panja TK, Saren AB, Mandal NK, and Biswas AB; infant- and Young Child-feeding Practices in Bankura District, West Bengal, India
41, Sikorski J, Renfrew MJ, Pindoria S, and Wade A: Support for breastfeeding mothers: a systematic review; Paediatric and Perinatal Epidemiology 2003,**17,** 407–417

42, Neyzi O, Olgunt P, Kutluay T, Uzel N, Saner G, GokGay, Tagdelen E, Akar U: Institute of Child Health, University of Istanbul, and tBarenzResearch Company, Istanbul, Turkey: An educational intervention on promotion of breast feeding; Paediatric & Perinatal Epidemiology; 1991, 5, 286-298.