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Breastfeeding practices and determinants in infants from birth to six months in a district of Abidjan - Cote d'Ivoire

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Abstract: *Introduction:* Exclusive breastfeeding (EBF) has the benefits of reduced rates of infectious morbidity and mortality. However, the EBF rate remains low worldwide including in Côte d'Ivoire despite efforts by health authorities.

Objective: The study was carried out to describe the knowledge and practices of mothers concerning infant feeding especially with regards to breastfeeding from birth to six months and to identify factors influencing these practices.

Methods: This was a descriptive and cross-sectional study conducted over a one-month period (1st to 31st August 2014) at a hospital in Abobo-Avocatier.

Results: A total of 318 mothers and their infants were recruited. The median (range) age of the mothers was 27 (14-40) years. Over half (64.5%) had some form of formal education, 78.9% lived with a partner while 24.5% were unemployed. The HIV status was unknown in 29.6% of cases. The majority of infants (94%), were born at term through vaginal route

(91.5%) and the median (range) age was 74 (2-180) days with a M:F ratio of 1.18.

More than half of mothers received advice on breastfeeding (57.2%) mainly by a health care provider (83%). The overall breastfeeding, EBF, predominant breastfeeding and mixed feeding rates were 79.9%, 43.3%, 46.84% and 18.9% respectively. Initiation rate of breastfeeding within the first hour was 29%. The maternal age ($p=0.007$) and low birth weight of the infant ($p=0.023$) were significantly associated with EBF. Other factors associated with EBF include the mother's occupation and being married.

Conclusion: Despite the high overall rate of breastfeeding in the study, EBF rates and timely initiation of breastfeeding after birth need to be improved. Awareness campaigns need to be strengthened and interventions instituted to scale up optimal breastfeeding practices.

Keywords: Infants, breastfeeding, determinants, birth, Cote d'Ivoire, six months.

Introduction

In 1990, United Nations Children's Fund (UNICEF), World Health Organisation (WHO) and all institutions working for improved child nutrition adopted the declaration which stated that "inadequate nutritional practices, such as the absence or inadequacy of breastfeeding remain the greatest threat against child health and survival in the world. Improving breastfeeding can save more than 3500 lives of children every day, more than any other intervention in preventive medicine".¹ Thus, for optimal nutrition, WHO and UNICEF jointly developed the "Global Strategy for the Infant and Young Child". Its recommendation was to initiate breastfeeding

within the first hour after birth, to practice exclusive breastfeeding during the first six months and continue breastfeeding for two years and beyond, while starting safe and age-appropriate complementary feeding from the age of six months.²

However, the success and continuation of breast-feeding depend on several factors such as awareness, socio-cultural factors, maternal conditions amongst others.³ Worldwide, only 38% of infants aged zero to six months are exclusively breastfed.² In Africa, the rate of exclusive breastfeeding varies from one region to another. In some West African countries exclusive breastfeeding rates are estimated at 20% (Cameroon in 2011)⁴, 23% (Niger in 2012)⁵, 39% (Senegal in 2010)⁶ and 17%

(Nigeria in 2013).⁷

In Côte d'Ivoire, the practice of breastfeeding is widespread.⁸ However, the exclusive breast feeding as defined by the WHO and recommended for the first six months of life is not a common practice.⁸ Since 1991, integrated strategies in Cote d'Ivoire have improved the rate of initiation and continuation of breastfeeding.⁸ Furthermore, the exclusive breastfeeding rate increased from 4% in 2006 to 12% in 2012.⁸ However, more efforts are needed to improve exclusive breastfeeding rates in order to approach and hopefully surpass the estimated percentage of 39%⁹ in many developing countries. Therefore this study was undertaken to describe the knowledge and practices of mothers concerning infant feeding especially with regards to breastfeeding from zero to six months and to identify factors influencing these practices. It is hoped that knowledge of these factors can help in addressing the hindrances with subsequent promotion of exclusive breastfeeding in Cote d'Ivoire.

Subjects and methods

The study was conducted at the immunization and paediatric outpatient clinic of Henriette Konan Bedie, hospital. This is a primary-level health facility, located in Avocatier-Abobo, the most populous town in Abidjan with a population estimated at 112,969 inhabitants. It is the most attended out of the nine health facilities that make up the health district of Abobo-East.

It was a descriptive and analytical cross sectional study undertaken from 1st to 31st of August 2014. Approval was obtained from the Human Research and Ethics Committee of the hospital and authorization also from the management before commencement of the study. Oral informed consent was also obtained from all participating mothers. All the mothers and their infants aged from 0 to 6 months in whom informed consent was obtained were included in the study. Infants whose mothers were absent or had no mother-child health records were excluded.

Data Collection

The mother-infant pairs were enrolled at the time they visited the facility during the entire period of the study. After obtaining informed consent, mothers were interviewed individually by the investigating physician and information obtained was entered into a research proforma. Data collected included socio-demographic characteristics of the mothers such as age, marital status, education and occupation. Other information obtained includes details of the antenatal period and consultations by the mother. Characteristics of the infants such as age, sex, birth-weight, feeding mode, nutritional status, health status, and vaccination status were also obtained. The mothers were also interviewed to obtain information concerning their knowledge, attitudes and practices about infant feeding whether breastfeeding, artificial milk only or mixed feeding (breast milk and artificial milk). Furthermore, breastfeeding practices were then

classified as: exclusive breastfeeding; breast milk & water; breast milk, water & other liquids, breast milk & porridge. The anthropometric indicators, weight for length (W/L) and weight for age (W/ A) were used to assess the nutritional status of the infants according to the classification by WHO Global Database on Child Growth and Malnutrition¹⁰. Any child with a z score > -2 was considered well nourished.¹⁰

Data management and analysis

The data obtained were entered into Epi Data and analyzed using the Statistical Package for the Social Sciences (SPSS) 17.0 software. Bivariate and multivariate logistic regression analysis were performed to determine the factors affecting the choice of infant feeding. Probability (p value) of <0.05 was taken as statistically significant.

Results

During the study period, 318 mothers were interviewed. Table 1 shows the characteristics of mothers. The median (range) age of the mothers was 27 (14-40) years, with the majority being aged between 19 and 34 years (84.2%). Over a third (35.5%) of mothers had no form of formal education. A great percentage (78.9%) lived with a partner and a quarter of them were unemployed (24.5%). The majority of mothers (81.4%) had at least four antenatal clinic visits as well as anti-tetanus vaccinations (87.1%). One third (38.7%) of the mothers were primiparous and about 29.6% were not aware of their HIV status.

Table 1: Socio-Demographic Characteristics of Mothers

Maternal characteristics (N=318)	Number of Mothers (n)	Percentages (%)
<i>Age (years)</i>		
<19	12	3.77
[19-35]	268	84.2
>35	38	11.95
<i>Education level</i>		
No formal education	113	35.5
Primary	94	29.6
Secondary	76	23.9
Tertiary	35	11.0
<i>Profession</i>		
unemployed	78	24.5
Petty traders	196	61.6
Civil servants	11	3.5
Student	33	10.5
<i>Marital status</i>		
Single	67	21.1
Cohabitation	93	29.2
Legally married	158	49.7
<i>HIV status</i>		
Known	224	70.4
Unknown	94	29.6
<i>Parity</i>		
Primiparous	123	38.7
Pauciparous	185	58.2
Multiparous	10	3.1

The characteristics of the infants are shown in Table 2. The median (range) age was 74 (2-180) days with a slight male preponderance (M:F- 1.18). A large proportion of the infants (94%) were born at term with vaginal delivery being the predominant route of delivery (91.5%). As much as 90.3% of infants were delivered within a health facility. With regards to the birth-weights of the infants, almost three quarters (72.3%) weighed 2500g and 3500g. Most infants (92.5%) had completed their immunization to date as at the time of the study, and had a good nutritional status (98.4%). There were only five (1.6%) infants out of the study population of 318 who were sick at the time of study.

Table 2: Characteristics of infants

Characteristics of infants (N=318)	Numbers of infants (n)	Percentage (%)
<i>Place of birth</i>		
At home	31	9.7
Health facility	287	90.3
<i>Mode of delivery</i>		
Vaginally	291	91.5
Caesarean	27	8.5
<i>Duration of gestation</i>		
Preterm	19	6.0
Term	299	94.0
<i>Sex</i>		
Male	172	54.1
Female	146	45.9
<i>Birth weight (g)</i>		
<2500	50	15.7
[2500-3500]	230	72.3
>3500	38	12.0
<i>Age (months)</i>		
[0-1[38	11.9
[1-3[137	43.1
[3-6[143	45.0
<i>Nutritional Status</i>		
W/A> - 2 SD Z score*	264	83.0
W/H>- 2 SD Z score**	313	98.4
<i>Acute illness</i>		
Healthy	313	98.4
Sick infants	5	1.6

* Absence of underweight ** Absence of acute malnutrition

Knowledge of mothers concerning infant feeding

More than half of mothers reported having received advice on breastfeeding (57.2%) and more often, the information had been provided by a health care provider (83%). The majority of mothers (93.1%) knew the definition of exclusive breastfeeding, however one quarter of them (25.8%) did not know the duration. The optimal duration of the entire breastfeeding period of two years recommended by WHO was unknown in 92.5% of the mothers. The benefits of breast milk known by different percentages of mothers respectively were: the low cost (66%), the ease of use (34.9%) and improved maternal-infant bonding (25.5%). The difficulties in breastfeeding adduced were breast diseases(81.1%), HIV infection (83%), untreated tuberculosis (71.7%) and mother's occupation (28.3%).

A great majority of mothers (76.4%) said they com-

menced artificial milk because they felt that breast milk was insufficient. One hundred and thirteen mothers (35.5%) said they knew how to prepare infant formula, however on further in-depth interview where they had to describe the procedure, slightly more than half of them (62.8%) knew how to prepare artificial milk effectively. The advantages ascribed to artificial milk and the percentages of mothers respectively include adequate growth of infants (43.4%) and liberty to go about their business(27.3%). However, 87.7% of mothers recognized that artificial milk can cause digestive disorders such as constipation, abdominal colic and vomiting in their infants.

Practices of mothers regarding infant feeding

Table 3 shows the different practices of mothers concerning breastfeeding. Some form of breastfeeding was practiced by 79.9% of mothers. Other forms of infant feeding practiced were only artificial milk in 4 cases (1.3%) and mixed feeding in 18.9% of them. The proportion of mothers who commenced breastfeeding in the first hour of the birth of the baby is slightly more than a quarter (29%) and less than half of them (43.3%) actually practiced EBF. In most instances, (78.3%) the mothers breastfed on demand and many mothers (80.2%) had never practiced manual expression of breast milk. For mothers who practiced mixed feeding, artificial milk was introduced in the first month in 70% of cases. Mothers gave water in addition to milk in 60% of cases. The main reason given by 50.3% of mothers was that the child was thirsty. Other liquids and cereals apart from water given by mothers include porridge (11.6%) and honey or juice (4%). Mothers who gave honey believed "it makes the child intelligent" and fruit juice "helps digestion for the baby". In view of these practices, the calculated predominant breastfeeding rate was 46.84%.

Table 3: Breastfeeding practices of mothers

Practices	No of mothers	Percentage
Exclusive breastfeeding	110	43.3
Breast milk and water	107	42.12
Breast milk, water and other liquids	15	5.9
Breast milk and porridge	22	8.66
Total	254	100.0

Factors influencing infant feeding mode

The relationship between the age of the mothers and mode of infant feeding is shown in Table 4. Mothers aged above 25years were more likely to practice EBF than those aged less than 25years (39.7% versus 24.8%) and this was statistically significant (p=0.008). Table 5 shows the relationship between the mode of infant feeding and the marital status of the mothers. Married mothers practiced more EBF than other modes of infant feeding practices when compared to unmarried mothers (39.9% versus 29.4%) and this was statistically significant by bivariate analysis (p=0.049). A greater proportion of unemployed mothers (full-time housewives)

practiced EBF compared to working mothers whether self-employed, in private or government employment (42.3% versus 32.1%) though this was not statistically significant ($p=0.099$). When multivariate logistic regression analysis was done, only the parameters “older age of the mother (25-40years)” and “having an infant with a birthweight greater than 2500g” (with p values of 0.007 and 0.023 respectively) as shown in table 6 were significantly associated with EBF.

Table 4: Relationship between the age of the mothers and mode of infant feeding

Age of mother	EBF		Other modes of infant feeding	
	Frequency	Percentage (%)	Frequency	Percentage (%)
< 25 years	27	24.8	82	75.2
25 years	83	39.7	126	60.3
P=0.008 (statistically significant)				

Breastfeeding+ artificial milk or artificial milk only

Table 5: Relationship between the marital status of mothers and mode of infant feeding

Marital status of mothers	EBF		Other modes of feeding	
	frequency	Percentage (%)	frequency	Percentage (%)
Married	63	39.9	95	60.1
Not married	47	29.4	113	70.6
P=0.049 (statistically significant)				

Table 6: Factors affecting exclusive breastfeeding

Exclusive Breast-feeding	Odds ratio	Standard Deviation	z	P value	Confidence Interval 95%
Age of mother 25-40 years	2.19	0.64	2.68	0.007*	(1.23-3.89)
Maternal education (>Secondary)	1.13	0.30	0.44	0.662	(0.66-1.91)
Maternal Occupation Housewife/Student	1.55	0.40	1.69	0.092	(0.93-2.58)
Parity More than one child	0.74	0.21	-1.04	0.299	(0.43-1.30)
Marital status Married	1.59	0.41	1.82	0.069	(0.96-2.63)
Mode of delivery Caesarean Section	0.96	0.43	-0.09	0.925	(0.40-2.29)
Knowledge of HIV Status Unknown	1.11	0.30	0.40	0.69	(0.66-1.89)
Advice on successful breastfeeding None	0.85	0.38	-0.36	0.715	(0.36-2.02)
Source of information on breastfeeding Other than a health worker	0.86	0.37	-0.35	0.715	(0.37-2.00)
Underweight Nil	0.82	0.28	-0.58	0.563	(0.18-0.88)
Birth weight Greater than 2500g	0.40	0.16	-2.28	0.023*	(0.18-0.88)
Constant	0.36	0.17	-2.21	0.027*	(0.14-0.89)

Logistic regression model

* Statistically significant

Discussion

In the current study, a sizeable number of mothers had some form of formal education. In addition over half of

them reported having received advice on breastfeeding especially from a health care provider. Concerning the knowledge of the mothers, even though many of them knew some benefits of breast milk, there were still a lot of knowledge gaps. Indeed, only 7.5% of mothers knew about the optimal duration of breastfeeding as recommended by WHO and one quarter of them (25.8%) did not know the duration of exclusive breastfeeding (EBF). A study by Oche¹¹ conducted in Northern Nigeria also demonstrated that only 31% of mothers had adequate knowledge of EBF. The identified knowledge gaps about EBF may be due to inadequacy of effective education, counseling and dissemination of appropriate information on EBF to pregnant women in the antenatal clinics and also to the general populace.

A high rate of breastfeeding was found in the current study, just as has been documented by other authors from various countries.¹²⁻¹⁴ It was also impressive that majority of infants were delivered in a health facility. However the rate of recommended timely initiation of breastfeeding² was quite low. This rate was lower than an earlier rate of 30.8% reported by demographic and health survey (DHS) in Cote d'Ivoire in 2012.⁸ However the rate is higher than the rates of 8% and 19.6% documented in a Nigerian¹¹ and Cameroonian¹⁵ study respectively. In contrast, a Nepal study¹⁶ reported a higher timely breastfeeding initiation rate of 72.7%. The reason for the low rate of timely initiation of breastfeeding observed in this study, despite majority of the deliveries occurring in a health facility is not immediately clear. It may be that health workers have not provided the necessary counselling, encouragement and enabling environment to the mothers for timely initiation of breastfeeding. Occasionally also, deliveries by caesarean sections in some settings cause some initial separation between mother and the infant thus delaying initiation of breastfeeding. Another possible reason commonly encountered in African settings is the common use of pre-lacteal feeds such as water, glucose water and formula feeds because of some socio-cultural myths and beliefs about the safety and “impureness” of colostrum.¹¹ Timely initiation of breastfeeding should be encouraged after all deliveries because studies have shown that delayed onset of breastfeeding increases the risk of neonatal mortality in Sub-Saharan Africa and neonatal mortality could be significantly reduced by 16% if the mothers started breastfeeding at day one and 22% when breastfeeding was commenced within the first hour.¹⁷ At the time of the survey, almost half of the mothers in the index study were still practicing exclusive breastfeeding. This was lower than a rate of 78.7% in a Northern Nigerian study¹⁸ and higher than a rate of 23.5% in a Northern Cameroonian study.¹⁹ The differences may be related to geopolitical factors, socio-cultural factors and age of the infants.

In the present study, mothers aged over 25 years were found to be more likely to breastfeed exclusively than younger mothers. A somewhat similar report of younger maternal age, being a significant independent predictor of early cessation of breastfeeding was reported by a

Western Australian study.²⁰ A possible reason is that older mothers may have more knowledge and experience of the advantages and techniques of breastfeeding than the younger ones. Furthermore, most younger mothers may likely also be primiparous and may lack confidence in insisting on the practice of EBF and may bow to pressure by grandmothers, husbands and other relatives as can occur in many cultural settings including Africa. However, a Chinese study²¹ documented a contrary finding where EBF was positively related to a younger age of the mother. Also, low infant birth weight significantly reduced an infant's chances of exclusive breastfeeding. Establishment and maintenance of breastfeeding in preterm low birth weight (PT LBW) neonates after discharge from hospital is challenging and may be affected by multiple factors as has been documented by a Bangladesh study.²² Factors significantly associated with EBF in PT LBW included shorter duration of hospital stay, method of feeding at discharge, mode of delivery, below average socio-economic status, maternal education, number of antenatal visits and larger birth weight.²² Sometimes, parents have not adhered to ideal breastfeeding practices because of impatience and overzealousness to achieve catch-up in the weight of their preterm babies.

Married mothers were also found to be breastfeeding more frequently than single mothers as has also been documented by a Ghanaian²³ and Chinese study²¹ respectively. It is obvious that the support of the husband improves the rate of breastfeeding. The mother's occupation though, not statistically significant also influenced the choice of infant feeding mode in the current study. Students and house wives were more likely to breastfeed exclusively and longer than working mothers. A Cameroonian study¹⁹ also reported that being a housewife was significantly associated with EBF. It may be that full-time housewives are always available to breastfeed or may be limited by the financial resources for the regular purchase of artificial milk.

Another important finding worthy of mention in the current study is that, nearly a third of mothers did not know their HIV status even though most of them had at least four antenatal visits. This is in agreement with a study across Sub-Saharan Africa which documented that pregnant women from West African countries had a lower rate of HIV testing as part of antenatal care compared to their counterparts from Eastern and Southern Africa.²⁴ This may be due to ignorance on the side of the women and lack of training or excessive workload on the part of the healthcare providers. In addition, due to persistence of stigmatization against people living with HIV in many parts of the West African subregion,²⁴ women may be reluctant to find out their HIV status in case it is positive. Mother-to-child transmission (MTCT), is the most common cause of paediatric HIV infection, often occurring during pregnancy, birth or breastfeeding.²⁵ Current guidelines recommend inclusion of HIV testing in routine screening tests for all pregnant women because knowledge of HIV status allows pregnant women access to prevention of mother-to-child transmission

(PMTCT) services.^{24,25} This makes antenatal care a vital component of efforts to prevent MTCT of HIV. Furthermore, as much as 18.9% of respondents in the index study admitted to practising mixed feeding. Exclusive breastfeeding for the first six months is associated with a 3-4 fold lower risk of HIV transmission in perinatally exposed infants as compared to mixed feeding.²⁶ It is believed that mixed feeding in the first six months carries a greater risk of transmission because the other liquids and foods given to the baby alongside the breast-milk can damage the already delicate and permeable gut wall of the small infant and allow the virus to be transmitted more easily.²⁶ Mixed feeding also poses the same risks of contamination and diarrhoea as artificial feeding, diminishing the chances of survival.²⁶ Therefore, knowledge of the infected mothers about their HIV status will empower them to make optimal choices of feeding for their infants for improved outcomes.

Limitations: There may have been some individual and other socio-cultural factors affecting breastfeeding practices that were not explored in the study.

Conclusion

Majority of the mothers had received advice on breastfeeding and delivered within a health facility. Even though the rate of breastfeeding was high, the percentage of mothers who initiated timely breast feeding was not optimal. The EBF rate is still not as high as desired. Older mothers and mothers of infants with normal birth weight were factors significantly associated with the practice of exclusive breastfeeding. There is a need to institute interventions aimed at early initiation of breastfeeding. Strengthening infant feeding advice/counseling both at the community and institutional levels in addition to promotion of good breast-feeding practices among expectant mothers and also the community, especially the families, taking into account the local traditions and customs is advocated. Younger mothers and mothers of low birth weight babies should be also targeted for effective counseling and support on EBF.

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Author's contributions

MKH: Carried out the interviews and collection of data. DM, FAM, KE, KC: Supervised the work. MKH and OEE wrote the manuscript. All the authors read and approved the final manuscript.

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