

Factors associated with breastfeeding initiation time in a Baby-Friendly Hospital

Emel Örün¹, S. Songül Yalçın¹, Yusuf Madendağ², Zeynep Üstünyurt-Eras²

Şehnaz Kutluk², Kadriye Yurdakök¹

¹Unit of Social Pediatrics, Department of Pediatrics, Hacettepe University Faculty of Medicine, and ²Dr. Zekai Tahir Burak Maternity and Research Hospital, Ankara, Turkey

SUMMARY: Örün E, Yalçın SS, Madendağ Y, Üstünyurt-Eras Z, Kutluk Ş, Yurdakök K. Factors associated with breastfeeding initiation time in a Baby-Friendly Hospital. Turk J Pediatr 2010; 52: 10-16.

The purpose of this study was to investigate maternal, gestational, and neonatal features associated with the early initiation of breastfeeding. A descriptive study was done between July-October 2006 in the maternity ward of Dr. Zekai Tahir Burak Maternity and Research Hospital, a certificated Baby-Friendly Hospital. Babies with postpartum health problems and those hospitalized in the newborn intensive care unit were not included into the study. A total of 577 mothers participated within 4 to 36 hours' postpartum on a voluntary basis. The mothers completed a questionnaire about the gestational, maternal, neonatal, and first suckling characteristics. Of the 577 cases, 35.2% initiated breastfeeding within the first hour while 72.8% of them initiated breastfeeding within the first two hours of birth. In the multivariate logistic analysis, it was found that the factors affecting early breastfeeding status (within the first 2 hours of birth) were maternal illness during pregnancy, cesarean section and preterm birth. We concluded that the prevention of premature birth, limitation of cesarean section indication, management of maternal anemia, regular and effective pregnancy follow-up visits are important for the early initiation of breastfeeding.

Key words: initiation, breastfeeding, Baby-Friendly Hospital.

In 1992, the World Health Organization (WHO) and United Nations Children's Fund (UNICEF) launched the Baby-Friendly Hospital Initiative to improve and support motherhood practices in breastfeeding¹. In order to be designated as "Baby-Friendly", a hospital needs to perform at least 80% of the "10 steps of successful breastfeeding". Of these, Step 4 asserts that mothers in the maternity ward who had normal vaginal deliveries should confirm that within a half hour of birth, they were given their babies to hold with contact, for at least 30 minutes, and offered help by a staff member to initiate breastfeeding (The Global Criteria for the WHO/UNICEF Baby-Friendly Hospital Initiative)¹.

Early breastfeeding initiation is of benefit to both the mother and the infant. With the initiation of breastfeeding, postpartum

hemorrhage is controlled with secreted oxytocin hormone. The first milk, colostrum, contains immunologic and nutritious properties not only to protect the newborn from infections but also to speed up their normal intestinal functions². Early breastfeeding has been seen to reduce neonatal and postneonatal deaths³. Furthermore, early touch of the nipple and areola (within 30 minutes) influences the maternal/infant relationship positively⁴. The regulation of body temperature and the blood glucose level are more satisfactory in babies who had early breastfeeding⁵. Earlier breastfeeding initiation and/or mother-baby contact also result in a preferred longer duration of breastfeeding⁶.

Breastfeeding is almost universal in Turkey, with 97% of all children breastfed for a period of time⁷. However, timing of breastfeeding for all children indicated that initiation to

breastfeeding was rather late. Only 54% of ever-breastfed children started to be breastfed as early as within the first hour of birth, and 16% were not even put to the breast within 24 hours of their birth. On the other hand, after starting the Baby-Friendly Hospital Initiative in 1992 in our country, the percentage of breastfeeding within the first hour of birth has increased from 20% in 1993 to 54% in 2003^{7,8}. The main objective of the present study was to determine the initiation time of breastfeeding and the factors affecting it in a Baby-Friendly Hospital in order to intervene and take appropriate measures to prevent delayed initiation.

Material and Methods

A descriptive study was done between July-October 2006 in the maternity ward of Dr. Zekai Tahir Burak Maternity and Research Hospital, a certificated Baby-Friendly Hospital. A total of 577 mothers participated in this study on a voluntary basis. Mothers with multiple pregnancies or health problems that affected breastfeeding (i.e. postpartum hemorrhage) were not included in the study. Babies with postpartum health problems, those hospitalized in the newborn intensive care unit were also not included into the trial. This study was approved by the Ethical Committee of the Faculty of Medicine, Hacettepe University (TBK07/07).

After informed consent was obtained from the 577 volunteer mothers, a questionnaire including the maternal, gestational, neonatal, and first suckling characteristics (maternal age, mother's educational level, mother's employment status, family structure, monthly income of the family, number of parity, interval since previous birth, parental harmony, planned pregnancy, maternal smoking or illness during pregnancy, maternal psychological problems within the year) was completed by three research assistants 4-36-hours' postpartum. The level of postpartum maternal hemoglobin (Hb), gestational age, birth weight, and type of birth were taken from the hospital records. Maternal Hb levels lower than 11 g/dl at delivery and gestational age lower than 37 weeks were taken as cut-off values for comparisons. Breastfeeding within the first two hours was defined as early breastfeeding in the present study.

Data were analyzed using the SPSS Windows program (SPSS Inc, Chicago, IL, USA). Chi-square test was used for comparing proportions. Multivariate logistic regression analysis was used to determine which factors among maternal age, family income, parental harmony, parity, birth interval, planned pregnancy, maternal illness or cigarette smoking during pregnancy, delivery type, gestational age, birth weight, and maternal Hb levels at delivery best predicted breastfeeding within two hours postpartum. Statistical significance level was set at $p < 0.05$.

Results

The mean (SD) maternal age was 25.6 (5.1) years (range: 16 to 42 years). Of all subjects, 90.4% of the mothers were >20 years of age, 92.5% were housewives, and 70.9% had been educated less than 8 years. The percent of infants from a nuclear family was 65.5. The monthly income was between \$250 and \$500 in nearly half of the families. There was a parental disharmony in 9.9% (Table I). Of all subjects, 3.9% of mothers required professional support in the previous year due to psychological problems.

The mean (SD) first breastfeeding time was 2.15 (1.98) hours postpartum (min-max: 0-24 hours). Of the 577 cases, 35.2% initiated breastfeeding within the first hour while 72.8% initiated breastfeeding within the first two hours after birth. However, this initiation in normal births within the first half an hour, and the first, second and third hours in the postpartum period were 16.8%, 51.2%, 81.4%, and 91.4%, respectively. In cases with cesarean section, these percentages were 2.8%, 18.9%, 64%, and 88.5%, respectively (Table II). Within the first three hours, the frequency of breastfeeding initiation was significantly higher in mothers giving normal birth than those having cesarean section ($p = 0.001$), but after three hours postpartum, the frequency of breastfeeding initiation was not affected by the route of delivery.

Breast-milk was the first food taken by 95.7% of the newborns. Seventy-five percent of the babies who were fed with formula were born by cesarean section. When analyzed further, these 72.5% of babies given formula were breastfed after the second hour. Overall, all mothers started breastfeeding within the first 24 hours.

Maternal age, educational level, employment status, monthly family income, parental harmony, and psychological problems/need for professional support within the year had no influence on early breastfeeding (Table I). Overall, 71.8% of the pregnancies were planned. The percentage of mothers smoking during pregnancy was 18.0%. Planned pregnancy and maternal smoking during pregnancy did not change early breastfeeding behavior.

Parity was more than one in 56.1% of mothers and birth interval was less than two years in 11.8%. Breastfeeding initiation was later in primiparous mothers than in mothers with parities ≥ 2 (67.2% vs 77.4%, respectively, $p=0.006$) (Table I).

Of all subjects, 27.6% of the mothers had an illness during pregnancy (29.6% urinary tract infections, 17.9% hypertension, 27.8% anemia, 9.9% diabetes mellitus and 14.8% others). The breastfeeding initiation rate was significantly lower in mothers who had an illness during pregnancy than in those who had no illness (66.0%, 75.4%, respectively; $p=0.03$) (Table III).

Overall, 8.1% of the pregnancies were terminated before 37 weeks. Preterm infants had significantly lower rates of early breastfeeding than term infants (56.5%, 73.8%, respectively; $p=0.01$). Gender and birth weight had no effect on early breastfeeding initiation (Table III).

Overall, 33.9% of mothers had anemia at delivery. The percentage of early initiation of breastfeeding was lower in anemic mothers than in non-anemic mothers (66.7%, 76.1%, respectively; $p=0.03$).

In the multivariate logistic regression analysis, the factors that influenced the initiation of early breastfeeding were maternal illness during pregnancy, preterm labor and delivery by cesarean section (Table IV).

Discussion

The most critical period of breastfeeding initiation is the first 0.5–2 hours after birth⁹⁻¹². WHO has rated the percentages of breastfeeding initiation in the first hour as poor (0–29%), fair (30–49%), good (50–89%), and very good (90–100%)¹³. In our study, the percentage of breastfeeding initiation within the first hour was an overall 32.8% (fair), whereas it was

72.8% within the first two hours. Researches on breastfeeding initiation time are limited and the data differ from country to country. For example, Nepal has a rate of 3.4% while Madagascar has a rate of 78% for breastfeeding initiation within the first hour^{14,15}.

Similar to our results, cesarean section seems to be a major barrier to early breastfeeding initiation¹⁶⁻²⁰. Adverse effects of anesthesia on mother–infant pairs, maternal discomfort and delayed onset of lactation are cited for the late initiation of breastfeeding in cesarean section deliveries. On the contrary, some studies failed to show such a relationship²¹. However, the cesarean section rates throughout the world are higher than the Healthy People 2000 goal, which is less than 15%^{22,23}. In our country, according to the Turkish Demographic and Health Surveys (TDHS)-2003 data, the rate of cesarean section was reported as 21%⁷. Thus, measures preventing cesarean section without medical indication should be implemented. In fact, measures should also be implemented to prevent a portion of elective cesarean sections, such as in situations where the mother has extreme delivery phobia, prefers delivery comfort, requests cesarean section, or when she is influenced by the gynecologist.²⁴ The sixth of the ten steps of successful breastfeeding indicates that newborn infants are to be given no food and drink other than breast-milk, unless medically indicated. In the present study, 4.3% of the babies were given formula as their first food. Babies delivered by cesarean section are usually given infant formula as the first food²⁵. Therefore, formula feeding should be avoided and mothers who have cesarean section should be given extra support to ensure early breastfeeding initiation.

Our results showed a positive association between multiparity and early initiation of breastfeeding. Similarly, Lessen et al.²⁶ reported that previous breastfeeding experience was positively associated with both intention and initiation, and the number of children was positively associated with initiation and inversely associated with intention. Primiparous mothers should be encouraged to benefit from the experiences of other multiparous breastfeeding mothers.

In this study, preterm infants had significantly lower rates of early breastfeeding than term infants. These data are consistent with those observed previously^{17,27}. This result may be explained by the coincident common problems, such as limited oral-motor skills, hypoglycemia, maternal adaptation to having a small infant, and delayed lactogenesis in premature infants²⁸.

In our trial, anemic mothers were less likely to initiate early breastfeeding. Similarly, Park et al.²⁹ showed that adolescent mothers with anemia (Hb < 12 g/dl) were less likely to breastfeed their babies. One of the possible

explanations for this is that anemic mothers tire easily, resulting in their unwillingness to breastfeed, which affects the breastfeeding negatively. Preventing maternal anemia not only improves the health of mother-child pairs but also increases the breastfeeding success.

According to the literature to date, several studies have investigated maternal age and educational level, employment status, monthly family income, parental harmony, maternal psychological problems within the last year, planned pregnancy, and maternal smoking during pregnancy for their impact on breastfeeding behavior^{20,25,26,30,31}. However,

Table I. General Characteristics of the Mothers According to Breastfeeding Initiation Time

Characteristics		Breastfeeding initiation time	
		≤ 2 hours#	>2 hours#
Age, year	< 20	37 (67.3)	18 (32.7)
	≥ 20	378 (73.4)	137 (26.6)
Educational level, year	≤ 8	305 (74.6)	104 (25.4)
	> 8	115 (68.5)	53 (31.5)
Employment status	Yes	27 (64.3)	15 (35.7)
	No	393 (73.5)	142 (26.5)
Family structure	Extended	144 (71.6)	57 (28.4)
	Nuclear	276 (73.4)	100 (26.6)
Family income monthly, \$	< 250	67 (69.1)	30 (30.9)
	250-499	233 (74.2)	81 (25.8)
	≥500	115 (71.4)	46 (28.6)
Parental harmony	Yes	375 (72.3)	144 (27.7)
	No	44 (77.2)	13 (22.8)
Parity*	1	170 (67.2)	83 (32.8)
	2+	250 (77.4)	73 (22.6)
Birth interval, year (n=313)	≤ 2	27 (73.0)	10 (27.0)
	>2	214 (77.5)	62 (22.5)
Total		420 (72.8)	157 (27.2)

#: n (percentage of row)

Comparison between breastfeeding initiation time of more than two hours and others:

*p<0.01

Table II. Breastfeeding Initiation Time According to Delivery Type, n (%)

Breastfeeding time after delivery	Delivery type		Total
	Vaginal delivery	Cesarean section	
≤30 minutes*	49 (16.8)	8 (2.8)	57 (9.9)
≤ 1 st hour*	149 (51.2)	54 (18.9)	203 (35.2)
≤ 2 nd hour*	237 (81.4)	183 (64.0)	420 (72.8)
≤ 3 rd hour*	266 (91.4)	253 (88.5)	519 (89.9)
≤ 4 th hour	277 (95.2)	268 (93.7)	545 (94.5)
≤ 6 th hour	287 (98.6)	276 (96.5)	563 (97.6)

Comparison between vaginal delivery and cesarean section;

*p< 0.001

Table III. Breastfeeding Initiation Time According to the Characteristics of the Pregnancy/Delivery and Newborn

Characteristics		Breastfeeding initiation time	
		≤ 2 hours#	> 2 hours#
Planned pregnancy	Yes	303 (73.4)	110 (26.6)
	No	115 (71.0)	47 (29.0)
Smoking during pregnancy	Yes	69 (67.0)	34 (33.0)
	No	347 (74.0)	122 (26)
Maternal illness during pregnancy*	Yes	105 (66.0)	54 (34.0)
	No	315 (75.4)	103 (24.6)
Maternal psychological problems	Yes	17 (77.3)	5 (22.7)
	No	403 (72.6)	152 (27.4)
Gestational age, week*	< 37	26 (56.5)	20 (43.5)
	≥ 37	383 (73.8)	136 (26.2)
Delivery type**	Normal	237 (81.4)	54 (18.6)
	Cesarean	183 (64.0)	103 (36.0)
Maternal hemoglobin at delivery, g/dl*	< 11	130 (66.7)	65 (33.3)
	≥ 11	289 (76.1)	91 (23.9)
Birth weight, g	< 2500	13 (72.2)	5 (27.8)
	≥ 2500	405 (72.8)	151 (27.2)
Gender	Girl	220 (73.1)	81 (26.9)
	Boy	197 (72.2)	76 (27.8)
First food*	Breast milk	414 (73.8)	147 (26.2)
	Formula	6 (37.5)	10 (62.5)
Total		420 (72.8)	157 (27.2)

#: n (percentage of row),

Comparison between breastfeeding initiation time of more than two hours and others:

*p<0.05, **p<0.01

Table IV. Associated Factors of Early Breastfeeding Initiation Time - Multivariate Logistic Regression Analysis

	Odds ratio	Confidence interval		Significance
		95%		
		Max	Min	
Maternal age: > 20 years	0.86	0.83	2.37	0.652
Family income ≥ \$250/month	1.40	0.40	1.63	0.209
Parity ≥ 2	1.44	0.95	2.19	0.083
Parental harmony	0.80	0.97	2.19	0.545
Planned pregnancy	0.92	0.73	1.97	0.710
No maternal illness during pregnancy	1.57	1.02	2.43	0.041
No smoking during pregnancy	1.20	0.59	1.43	0.473
Vaginal delivery	2.33	0.71	1.57	< 0.001
Gestational age ≥ 37 weeks	2.98	1.55	3.50	0.002
Birth weight ≥ 2500 g	0.98	0.44	1.69	0.968
Baby gender, boy	1.06	1.49	5.97	0.782
Maternal hemoglobin at delivery ≥ 11 g/dl	1.45	0.30	3.17	0.073

none of these factors was shown to influence early breastfeeding initiation in our study.

The limitation of the present study is that only one maternity hospital was included. However, this is one of the largest delivery hospitals in Ankara primarily serving mothers with low socioeconomic and sociocultural status. Therefore, the outcome of this research may be used for constituting political strategies for those of low socioeconomic status.

In our study, the most important prenatal and postnatal factors associated with breastfeeding within the first two hours were determined to be maternal anemia, maternal illness during pregnancy, cesarean section delivery, and premature birth. Therefore, effective antenatal care to prevent and appropriately treat maternal anemia and infections and decreases in cesarean section deliveries and premature births will contribute to early breastfeeding initiation.

REFERENCES

1. http://whqlibdoc.who.int/publications/2004/9241591544_eng.pdf. (accessed June 28, 2008).
2. Gartner LM, Morton J, Lawrence RA, et al. American Academy of Pediatrics Section on Breastfeeding. Breastfeeding and the use of human milk. *Pediatrics* 2005; 115: 496-506.
3. Edmond KM, Zandoh C, Qigley MA, Amenga-Etego S, Owusu-Agyei S, Kirkwood BR. Delayed breastfeeding initiation increases risk of neonatal mortality. *Pediatrics* 2006; 117: e380-e386.
4. Widstrom AM, Wahlberg V, Matthiesen AS, et al. Short-term effects of early suckling and touch of the nipple on maternal behaviour. *Early Hum Dev* 1990; 21: 153-163.
5. Christensson K, Siles C, Moreno L, et al. Temperature, metabolic adaptation and crying in healthy full-term newborns cared for skin-to-skin or in a cot. *Acta Paediatr* 1992; 81: 488-493.
6. Perez-Escamilla R, Pollitt E, Lönnerdal B, Dewey KG. Infant feeding policies in maternity wards and their effect on breast-feeding success: an analytical overview. *Am J Public Health* 1994; 84: 89-97.
7. Ministry of Health [Turkey], Hacettepe University Institute of Population Studies, Macro International Inc. 2004. Turkish Demographic and Health Surveys 2003.
8. Ministry of Health [Turkey], Hacettepe University Institute of Population Studies, Macro International Inc. 1994. Turkish Demographic and Health Surveys 1993.
9. Righard L, Alade MO. Effect of delivery room routines on success of first breastfeed. *Lancet* 1990; 336: 1105-1107.
10. Widstrom A-M, Thingström-Paulsson J. The position of the tongue during rooting reflexes elicited in newborn infants before the first suckle. *Acta Paediatr* 1993; 82: 281-283.
11. DiGrilamo AM, Grummer-Strawn LM, Fein S. Maternity care practices: implications for breastfeeding. *Birth* 2001; 28: 94-100.
12. Sinusas K, Gagliardi A. Initial management of breastfeeding. *Am Fam Physician* 2001; 64: 981-988, 991-992.
13. <http://whqlibdoc.who.int/publications/2003/9241562544.pdf>. (accessed June 27, 2008).
14. Baker EJ, Sanei LC, Franklin N. Early initiation of and exclusive breastfeeding in large-scale community-based programmes in Bolivia and Madagascar. *J Health Popul Nutr* 2006; 24: 530-539.
15. Mullany LC, Katz J, Li YM, et al. Breastfeeding patterns, time to initiation, and mortality risk among newborns in southern Nepal. *J Nutr* 2008; 138: 599-603.
16. Awi DD, Alikor EA. Barriers to timely initiation of breastfeeding among mothers of healthy full-term babies who deliver at the University of Port Harcourt Teaching Hospital. *Niger J Clin Pract* 2006; 9: 57-64.
17. Nakao Y, Moji K, Honda S, Oishi K. Initiation of breastfeeding within 120 minutes after birth is associated with breastfeeding at four months among Japanese women: a self-administered questionnaire survey. *Int Breastfeed J* 2008; 3: 1-7.
18. Kovach AC. A 5-year follow-up study of breastfeeding policies in the Philadelphia area: a comparison with the ten steps. *J Hum Lact* 2002; 18: 144-154.
19. Rowe-Murray HJ, Fisher JR. Baby friendly hospital practices: cesarean section is a persistent barrier to early initiation of breastfeeding. *Birth* 2002; 29: 124-131.
20. Theofilogiannakou M, Skouroliakou M, Gounaris A, Panagiotakos D, Markantonis SL. Breastfeeding in Athens, Greece: factors associated with its initiation and duration. *J Pediatr Gastroenterol Nutr* 2006; 43: 379-384.
21. Xu F, Binns C, Yu P, Bai Y. Determinants of breastfeeding initiation in Xinjiang, PR China, 2003-2004. *Acta Paediatr* 2007; 96: 257-260.
22. Flamm BL. Cesarean section: a worldwide epidemic? *Birth* 2000; 27: 139-140.
23. Healthy People 2000. Maternal and Infant Health Progress Review. <http://www.cdc.gov/nchs/about/otheract/hp2000/childhlt/childhlt.htm>
24. Penn Z, Ghaem-Maghani S. Indications for cesarean section. *Best Pract Res Clin Obstet Gynaecol* 2001; 15: 1-15.
25. Meyerink RO, Marquis GS. Breastfeeding initiation and duration among low-income women in Alabama: the importance of personal and familial experiences in making infant-feeding choices. *J Hum Lact* 2002; 18: 38-45.
26. Lessen R, Crivelli-Kovach A. Prediction of initiation and duration of breast-feeding for neonates admitted to the neonatal intensive care unit. *J Perinat Neonatal Nurs* 2007; 21: 256-266.

27. Merewood A, Brooks D, Bauchner H, et al. Maternal birthplace and breastfeeding initiation among term and preterm infants: a statewide assessment for Massachusetts. *Pediatrics* 2006; 118: e1048-1054.
28. Howe TH, Sheu CF, Hsieh YW, Hsieh CL. Psychometric characteristics of the Neonatal Oral-Motor Assessment Scale in healthy preterm infants. *Dev Med Child Neurol* 2007; 49: 915-919.
29. Park Yi K, Meier R, Song WO. Characteristics of teenage mothers and predictors of breastfeeding initiation in the Michigan WIC Program in 1995. *J Hum Lact* 2003; 19: 50-56.
30. Celi AC, Rich-Edwards JW, Richardson MK, Kleinman KP, Gillman MW. Immigration, race/ethnicity, and social and economic factors as predictors of breastfeeding initiation. *Arch Pediatr Adolesc Med* 2005; 159: 255-260.
31. Dubois L, Girard M. Social determinants of initiation, duration and exclusivity of breastfeeding at the population level. *Can J Public Health* 2003; 94: 300-305.