Matern Child Health J (2008) 12:734–738
DOI 10.1007/s10995-007-0269-1

Exploratory Study: Knowledge about the Benefits of Breastfeeding and Barriers for Initiation in Mothers of Children with Spina Bifida

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Published online: 15 September 2007

Abstract The aim of the study is to identify the level of knowledge on breastfeeding by mothers of infants with spina bifida and the barriers encountered in initiating breastfeeding. A non-probabilisitic sample ($n = 30$) of mothers was used in this study. The sample was obtained in two institutions specializing in care for infants with congenital anomalies in Puerto Rico. A self-administered questionnaire was used consisting of six sections. Descriptive statistics were used for data analysis. Among participants, 56.7% had adequate knowledge on the benefits of breastfeeding. The most frequently encountered barriers in initiating breastfeeding were related to the neonatal intensive care unit (NICU). Problems with the medical and nursing procedures, routines, support from personnel, and adequacy of the environment were the most frequent. It is important to develop a education to encourage nurses and other health care professionals need suggest, support and encourage breastfeeding to mothers of infants with neural tube defects.

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Keywords Spina bifida · Knowledge · Barriers · Breastfeeding

Introduction

In Puerto Rico, the birth of an infant with spina bifida [ISB] triggers the application of a special protocol of medical and nursing care. The neonate is immediately transported to the NICU, as a preventive measure against infections. Corrective surgery on the birth defect is carried out within 24–48 h after birth. This surgery is carried out by a neurosurgeon, who also evaluates whether additional surgery for shunting will be necessary, in cases of associated hydrocephaly. The neonate will be nourished intravenously during the first hours of life. The consequences of this management are the early separation of babies from their mothers, the missed opportunity for mothers to breastfeed their babies, and the missed benefits to the babies and their mothers of early breastfeeding.

Several studies have reported on the breastfeeding benefits for low birth weight and preterm infants and their mothers. These infants maintain higher blood oxygen levels, better temperature levels, and better breathing patterns after breastfeeding than after bottle feeding [1]. Breastfeeding protects against necrotizing enterocolitis, infections and immediate allergies [2, 3], as well as promoting retinal maturation [2, 3]. Greater stability of the cardiac rhythm [4] and less physiologic demand on the infant is promoted [4]. Associated morbidity in cases of neurological disorders and gastrointestinal blood loss is diminished [5].

We did not find published literature on the knowledge of the breastfeeding benefits by mothers of ISB, and the barriers encountered by them in the initiation of breastfeeding, this being the principal purpose of this study.

Methodology

A cross-sectional survey was conducted with the universe of mothers ($n = 30$) whose infants were receiving health services in two specialized institutions for infants with congenital anomalies. Criteria for inclusion were: biological mothers of ISB of 36 months of age or less, who could read and write in Spanish. The interviews were conducted by the principal investigators. A questionnaire of semi-structured questions was designed, consisting of six parts: sociodemographic data, information on the infant and his/her condition, information on the pregnancy and birth of the ISB, knowledge of breastfeeding benefits, mother's breastfeeding experience and barriers encountered for initiation of breastfeeding.

Level of knowledge on the mother's part regarding breastfeeding benefits was measured through 15 premises with a nominal scale (Yes, No, and I do not know). For the purpose of analysis premises were categorized as (1) correct and (0) incorrect, and were then added. The "I do not know" premise was considered as an incorrect answer in the analysis. Knowledge was considered adequate when 70% of the premises were correct and inadequate otherwise [6]. The type of breastfeeding was defined as per Labbok and Krasovec [7].

The study was approved by the IRB-RCM of the University of Puerto Rico. Analysis was performed with SPSS version 11.0 for personal computers [8]. Being an exploratory study consisting of a small number of participants only descriptive statistics were applied to data analysis.

Results

The median age was 28 years ($SD = 5.6$) with a range from 17 to 37 years of age and 80.0% of mothers were between 20 and 34 years. The median school years completed was 13 years ($SD = 2.8$) with a range between 6 and 17 years. We found that 53.4% of participants had 13 or more completed years of education and 90.0% were Puerto Ricans (Table 1).

The median duration of the pregnancy was 9.0 months ($SD = 0.4$). We found that 72.4% of interviewed mothers reported the pregnancy lasted 9 months. Primiparas accounted for 64.3% of the mothers; 48.3% indicated they knew in advance that their baby would be born with severe spina bifida. The median postpartum days of hospitalization was 3 ($SD = 4.3$). Hospital stay was between 1 and 3 days for 72.4% of the mothers, and 27.6% reported a stay of 4 or more days (Table 1).

Among participants, 63.3% of multiparas had breastfed at least one child. Among breastfeeding mothers, 73.6% indicated having breastfed their child with spina bifida (Table 1). Breastfeeding of the ISB had begun in the hospital in 64.3% of the mothers who breastfed and breastfeeding initiation occurred 1–3 weeks after birth in 42.9% of the cases. Feeding directly from the breast was carried out by 71.4% of mothers who gave their milk to their babies. Of those who fed directly from the breast, 90.0% did it on a daily basis.

Only 14.3% breastfed exclusively and 35.7% practiced high partial breastfeeding. It should be pointed out that 64.3% of the mothers weaned their babies between 4 and 6 weeks of age. Only 7.1% were still breastfeeding at the time of the study. Likewise, mothers reported that 66.7% of their babies were female. The defect was in the lower back in 76.7% of the babies and myelomeningocele accounted for 93.1% of the cases.

Associated health conditions affected 93.3% of the babies and the most frequently associated condition was hydrocephaly (35.7%), followed by problems with the urinary bladder (32.2%), and other orthopedic problems (17.8%). The median duration of NICU stay was 18 days ($SD = 1.8$) with an interval ranging from 0 to 90 days, and the median number of daily visits by mothers to the NICU was one ($SD = 2.6$). The duration range fluctuated between 0 and 15 daily visits. Specifically, 48.3% of interviewed mothers visited the NICU once daily and 34.5% did so twice daily (Table 1).

Breastfeeding Benefits Knowledge

The majority of interviewed mothers (56.7%) had 70% or higher correct answers regarding the benefits of breastfeeding. Analysis of the premises showed that interviewed mothers showed higher level of knowledge on the benefits of breastfeeding for the baby than for the mother. We also found that 96.7% identified mothers' milk as the best nutrition for the baby, and 93.3% knew that breastfed babies have less colic problems. However, only 30.0% demonstrated knowledge on the advantage of breastfeeding for psychomotor skills development. The protective effect of breastfeeding against ovarian cancer was known to 43.3% of mothers and 46.7% knew that breastfeeding can serve as a contraceptive method during the first 6 months if babies are fully breastfed and postpartum amenorrhea persists. (Table 2).

Barriers for Initiation of Breastfeeding

The length of the hospital stay constituted 35.8% of the motives reported by mothers who decided not to breastfeed their ISB (e.g. "my breasts dried up due to the many days of the baby in the hospital"), the health or preference of the

Table 1 Characteristics related with mothers and spina bifida infants

Variable	*N*	%
Mother's age (years)		
≤34	24	80.0
35–37	04	13.3
≥38	02	6.7
Education (years)		
≤6	01	3.3
9–Jul	04	13.3
12–Oct	09	30.0
≥13	16	53.4
Ethnicity		
Puerto Rican	27	90.0
American	02	6.7
Dominican	01	3.3
Duration of pregnancy		
9 months	22	72.4
8 months	08	27.6
Previous births		
Primiparous	19	64.3
Multiparous	11	35.7
Days of pospartum hospitalization		
1–3 days	22	72.4
≥4 days	08	27.6
Knowledge of spina bifida diagnosis before delivery		
I know	16	48.3
I do not know	14	51.7
Spina bifida child breastfeeding		
Yes	22	73.6
No	08	26.4
Type of breastfeeding (n = 22)		
Exclusivity	03	14.3
Almost exclusive	05	21.3
High partial	07	35.7
Moderate partial	02	7.2
Low partial	03	14.3
Token	02	7.2
Infant's gender		
Female	20	66.7
Male	10	33.3
Lesion level		
Lower back	23	76.7
Middle back	07	23.3
Type of spina bifida		
Myelomeningocele	28	93.1
Meningocele	02	6.9
Others infant's health conditions		
Yes	29	93.3
No	01	6.7
Number of daily visits to NICU (n = 29)		
0	2	6.9
1	14	48.3
2	10	34.5
3	1	3.4
≥4	2	6.9

baby accounted for 28.5% (e.g. "got used to the formula"), maternal reasons for 21.4% (e.g. "I was taking antibiotics"), hospital procedures for 14.3% (e.g. it was impossible to breastfeed in the NICU"). The mothers who decided to wean their babies with spina bifida did so for motives related to the infant (48.2%), specifically "the baby did not want the breast any longer". 57.2% of reported motives were related to the mother, specifically "low milk supply".

Other barriers identified in the study were related to the health care personnel. It was observed that 50.0% of the participants were given no orientation by hospital personnel on the techniques for milk extraction. Two thirds of the participants stated they received no support from the NICU personnel, and 76.7% stated they received no support from NICU personnel on breastfeeding a baby with spina bifida.

Among study participants, 82.8% stated they were not informed about the routines of the NICU for breastfeeding. Over three quarters of the mothers (77.8%) stated that the distance from their room to the NICU was inadequate (too far) for breastfeeding. The environment in the NICU was described by 73.3% as inadequate for breastfeeding.

Discussion

Over half of the multiparous mothers of an ISB stated they had breastfed at least one other child. Previous experience breastfeeding has been identified as a factor for breastfeeding [9, 10]. Nevertheless, one-third of the participants with previous breastfeeding experience did not breastfeed an ISB. One reason could be the baby's health status, as reported in the literature [11].

Benefits to pre-term infants and those with congenital conditions have been shown as one of the most important issues in many studies [12–18]. Many mothers reported better maternal and infant bonding, their baby's intelligence perception was considered better, and they stated that breastfeeding is a money-saving practice. Nevertheless, the majority of the mothers showed no knowledge on the breastfeeding benefits for the development of motor skills. Breastfed infants achieve better physical and mental growth than those not breastfed [14, 19].

Table 2 Knowledge by mothers of infants with spina bifida on the benefits of breastfeeding

Items	Correct		Incorrect	
	n	%	*N*	%
Mother's milk is the best feeding for the newborn. (True)	29	96.7	1	3.3
Breastfed babies have fewer ear infections. (True)	17	56.7	13	43.3
Fat in mother's milk helps in the development of the baby's brain. (True)	19	63.3	11	36.7
Breastfeeding mothers tend to lose the weight gained in pregnancy faster (True)	24	80	6	20
Breastfeeding mothers have less risk of developing ovarian cancer in the future. (True)	13	43.3	17	56.7
Breastfeeding is more expensive than formula feeding (False)	29	96.7	1	3.3
Infants breastfed exclusively tend to develop motor skills faster (True)	9	30	21	70
Breastfeeding provides for a closer bonding between the mother and her child (True)	28	93.3	2	6.7
Feeding a baby only at the breast for the first six months serves as a natural contraceptive method, if menstruation has not returned (True)	14	46.7	16	53.3
Formula fed babies are more intelligent than those breastfed (False)	25	83.3	5	16.7
Breastfed babies tend to have less gastrointestinal problems (True)	24	80	6	20
Breastfeeding mothers tend to have lower stress levels (True)	11	36.7	19	63.3

Gaps in the knowledge of breastfeeding benefits also were identified. The majority of the participants stated that breastfeeding mothers suffer more stress. Nevertheless, breastfeeding reduces the level of maternal stress for infants' mothers with congenital anomalies [13, 18]. Although breastfeeding is a natural contraceptive [20, 21] the majority of participants did not identify this as a benefit. Another area not familiar to the majority of the participants was the protective effect of breastfeeding against ovarian cancer, as recognized in the literature [18, 22].

Multiple barriers identified in the literature to initiate and/or prolong breastfeeding were identified between participants such as: perception of insufficient milk production and the baby did not like mother's milk [13, 23], baby 's health status [11], or poor support of NICU personnel [11, 23]. It should be noted that other associated barriers to the initiation of breastfeeding an ISB and related specifically to the NICU areas were identified. Orientation towards those closer to the mother in themes such as: the NICU routines, the importance of the closeness to the mother's room, number of daily visits allowed to the NICU, and the proper environment in NICU. Similar barriers were identified in others studies [13, 23, 24].

This study was limited by a small sample size ($n = 30$) of mother of infants with spina bifida and may not be generalizable to the whole population. Also, because surveys were conducted with mothers of ISB of 36 months of age or less, recall bias may have been introduced.

Results of this work suggest that greater emphasis should be placed on the benefits of breastfeeding for the mother, as well as in infants. A possible strategy would be to develop an educational and social marketing campaign that stresses the benefits for the mother, since the typical campaigns tend to be directed towards the benefits for the baby. We postulate that if mothers of infants with spina bifida knew about the benefits for them as they know of the benefits for their child that would possibly increase the number of breastfed children in this population.

To achieve successful breastfeeding we recommend providing support and information to mothers of children with neurological conditions [9, 10]. Specifically, this research supports the need to provide mothers with information on breastfeeding benefits in the motor skills area, since this is a principally affected area in ISB.

It is necessary to develop an educational plan for administrative and NICU personnel to increase awareness on breastfeeding benefits for the mother/baby dyad and measures needed to facilitate breastfeeding. We need to promote structural changes in hospitals and in the NICU environments so as to facilitate an adequate milieu for breastfeeding. Breastfeeding education cannot be limited to the derived benefits to the mother and child health; breastfeeding education has to include aspects such as breastfeeding facilitation in sensible environments including NICU.

Acknowledgment We would like to acknowledge Mr. Victor E. Reyes Ortiz for his support as technical writer for the present publication.

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