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**THE EFFECT OF A HOSPITAL-BASED
BREASTFEEDING PROMOTION PROGRAM ON
EXCLUSIVE BREASTFEEDING AMONG
LOW-INCOME WOMEN IN BRAZIL**

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PROMOTION PROGRAM ON EXCLUSIVE BREASTFEEDING
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IN BRAZIL**

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ABSTRACT

The effectiveness of a hospital-based breastfeeding promotion program on exclusive breastfeeding (EBF) among low-income women in Santos, Brazil was evaluated using a prospective controlled design. Prevalences and rates of exclusive breastfeeding at 30 and 90 days post-partum were determined through home visits for two groups of women: 1) those who delivered at a hospital where a breastfeeding promotion program has been active for over 20 years (the program hospital; n=236); and, 2) those who delivered at a nearby hospital without such a program (the control hospital; n=206). Women in both hospitals were similar with respect to demographic and biomedical characteristics, including previous breastfeeding history and planned duration of EBF. Exposure to breastfeeding promotion activities, as assessed by maternal recall prior to discharge, was universally high at the program hospital and universally low at the control hospital. Delivery at the program hospital (versus the control hospital) was strongly associated with EBF: the median duration of EBF was 53 days longer among women who delivered at the program hospital ($p < 0.001$). The similarity between the two groups of women, coupled with the vast difference in exposure to breastfeeding promotion activities, suggest that the large difference, nearly two months, in EBF can be attributed to these activities.

KEY WORDS: Exclusive breastfeeding, breastfeeding, human lactation, breastfeeding promotion, maternity wards, program effectiveness, urban, Latin America

INTRODUCTION

Evidence of a strong protective effect of exclusive breastfeeding¹ (EBF) on infant morbidity and mortality in the developing world (1 - 3) stands in sharp contrast to data showing the rarity of this practice (4 - 7). The observation that high rates of breastfeeding initiation and long durations of any breastfeeding coexist with short durations of EBF highlights the importance of identifying strategies successful in extending the duration of EBF.

A recent analytical overview of experimental and quasi-experimental studies of specific infant feeding policies in maternity wards and subsequent breastfeeding practices concluded that policies such as rooming-in or the elimination of routine formula supplementation can have positive effects on full breastfeeding (i.e. breastmilk and water as the only source of infant food) and any breastfeeding (8). This overview focused on specific policies only because no published and well documented experimental or quasi-experimental studies were available that could be used to ascertain the total effect of a comprehensive hospital-based breastfeeding promotion program on breastfeeding. Furthermore, there were no studies that examined these effects on EBF.

The objective of this study was to measure the effectiveness of a comprehensive hospital-based breastfeeding promotion program on EBF among low-income women in Brazil. To our knowledge, this is the first study to measure the effectiveness of hospital-based breastfeeding promotion on the duration of EBF using an appropriate control and a longitudinal design.

¹Exclusive breastfeeding is defined as breastmilk as the sole source of infant food.

POPULATION AND METHODS

The effectiveness of a comprehensive hospital-based breastfeeding promotion program on EBF among low-income women in Santos, Brazil was evaluated as part of a larger study on the cost-effectiveness of hospital-based breastfeeding promotion in Latin America². A prospective controlled design was used to compare prevalences and rates of EBF at 30 and 90 days post-partum for two groups of women: 1) those who delivered at a hospital where a breastfeeding promotion program has been active for over 20 years (the program hospital); and, 2) those who delivered at a nearby hospital without such a program (the control hospital). Both hospitals serve low-income, uninsured women who can choose to deliver at either hospital without charge.

For nearly 20 years the program hospital has had a comprehensive breastfeeding promotion program characterized by rooming-in, early initiation of breastfeeding, and breastfeeding assistance and talks during hospitalization by trained health personnel. These talks include information on the importance of EBF for the first 6 months of infancy, how to solve common breastfeeding problems, and where to find post-partum breastfeeding help. The program hospital also provides breastfeeding information during prenatal care.

In the control hospital, there is no breastfeeding promotion program, though several reforms mandated by Brazilian law such as rooming-in and prohibition of free gifts of infant formula have been instituted. It was selected for study out of seven possible public hospitals in Santos because its maternity population had similar demographic and socioeconomic characteristics to that of the program hospital.

²Data on costs will be reported elsewhere.

All women delivering healthy, singleton infants with birthweights above 2000 g between June 1992 and March 1993 were entered into the study. Data were collected by abstracting medical information from hospital records, and by interviewing women just prior to hospital discharge and in their homes at 30 and 90 days post-partum.

In the hospital interview, exposure to a number of hospital practices and activities related to breastfeeding was assessed by maternal recall. Detailed information was also collected on previous breastfeeding history, breastfeeding plans, prenatal exposure to breastfeeding information, demographic characteristics, and socio-economic status. To control for potential selection bias in that women more likely to practice optimal breastfeeding behaviors would seek out a hospital that was supportive of breastfeeding, women were asked in an open ended question why they chose the particular hospital of delivery.

Exclusive breastfeeding was assessed at each follow-up visit by 24-hour maternal recall using a structured list of commonly used infant liquids (including water) and foods. Infants were classified as EBF only if the mother responded negatively to all items on the recall except breastmilk. Information was also collected on post-partum breastfeeding information that had been received.

Experienced interviewers, not associated with either of the hospitals, were trained to administer the questionnaires and were rotated between hospitals. Two physicians administered the hospital questionnaire and abstracted medical information from the hospital records. Three social workers conducted household interviews and were blinded with respect to the study objectives and the hospital in which the mother gave birth, although in some instances the mother mentioned the hospital during the interview.

Sample characteristics and exposure to program activities were compared between hospitals using chi-square for categorical and Student's t-test for continuous variables. The Cox model, which takes into account censored data, was used to generate survival curves for the multivariate analysis. In this model, the duration of EBF of infants that were still EBF when they were lost to follow-up or that were still EBF at the end of the study was based on the age of the infant when he was last observed. In both instances, EBF duration was identified as a censored value in the model. All analyses were performed using SPSS for Windows (SPSS, 1992).

RESULTS

A total of 236 women were interviewed at the program hospital and 206 women were interviewed at the control hospital. Complete data for both follow-up visits are available for 179 and 162 women from the program and control hospitals, respectively, representing nearly 80% of the original sample. No difference in attrition was found between hospitals. With few exceptions, women who were followed had similar characteristics to those who were not followed.

Women delivering in the two hospitals were similar with respect to age, education, employment status, socio-economic score, proportion living with the infants' father, parity, proportion that were primiparae, receipt of prenatal care, and sex of offspring ($p > 0.1$). Differences were found with respect to infant birthweight ($p < 0.001$) and delivery by cesarean section ($p < 0.001$), both of which were higher in the control hospital (Table 1). All women had already breastfed their infants by the time of the hospital interview.

Maternal motivation to breastfeed, as assessed by length of time the previous child was breastfed (among the 57% who were multiparae) and planned duration of EBF, did not differ between hospitals (Table 2). As compared to women in the control hospital, women in the program hospital were more likely to have received breastfeeding information during prenatal care ($p < 0.05$), and post-partum prior to the first follow-up visit ($p < 0.001$) though not between the first and the second visit (Table 2).

Although the reasons for choosing a particular hospital differed by hospital, not a single woman cited interest in breastfeeding nor the breastfeeding program as a reason to deliver at the program hospital (Table 3). However, 24 women who delivered at the control hospital reported that they did so because the program hospital was full: another 15 did so because an "other" unspecified hospital was full. The prevalence of EBF at either follow-up visit for these groups of women did not differ from those who gave other reasons. Furthermore, within hospitals there was no association between specific reasons for hospital choice and EBF.

Differences between hospitals were found for 15 of the 16 indicators of program exposure ($p < 0.001$) or all indicators except "receipt of free formula" (Table 4). Exposure at the program hospital was universally high while exposure at the control hospital was universally low. For example, in the program hospital 65% of women nursed their infant in the delivery room compared to only 2% of women at the control hospital; 87% of women in the program hospital received a breastfeeding talk during hospitalization compared to 18% of women in the control hospital.

Delivery in the program hospital (versus the control hospital) was strongly associated with EBF: the median duration was 75 days among women in the program hospital compared to 22 days among women in the control hospital. Thus, the median duration of EBF was 53 days longer among women giving birth in the program hospital ($p < 0.001$) (Figure 1; Table 5). At month 1, the probability of EBF was 0.64 if the program hospital compared to 0.39 in the control hospital: this translated to 250 additional women per 1000 that would be EBF if they had delivered in the program rather than the control hospital. At month 3, this figure is 260 per 1000 (Table 5). Controlling for potential confounding variables (birthweight, cesarean section, pre- and post-natal breastfeeding information) did not change these results (Table 5).

DISCUSSION

Despite the vast literature on the protective effects of EBF on morbidity and mortality only two studies report an increase in EBF as a result of breastfeeding promotion. Valdes (9) reported a significant increase in EBF among a highly select and motivated group--middle-income married Chilean women who planned to use the lactational amenorrhea method (LAM) for contraception--exposed to a program of intensive post-partum counseling. The pre-post breastfeeding intervention in this study was not part of an on-going program but specifically designed to test the contraceptive efficacy of LAM. Results from this highly select and motivated group of Chilean women cannot be generalized to the vast majority of women in developing countries who do not share their characteristics. Berkhalter and Marin (10) used a pre-post design to evaluate a breastfeeding program, which included post-partum home visits, among low-income Chilean women. Although an increase in EBF was

documented, because most health budgets do not permit costly home visits, these results cannot be generalized to other settings.

The inferences that can be drawn from this study depend on the degree to which a key assumption, that women delivering in the two hospitals were similar in all respects except for exposure to the program, is satisfied (11 - 12). To the extent that any non program variable is associated with both the program and the duration of EBF, differences observed between the two groups could be the result of confounding rather than the program. Establishing the plausibility that the difference in EBF between the two hospitals resulted from program exposure thus depends on the extent to which alternative explanations can be rejected. Such explanations include: 1) differences in maternal and/or biomedical characteristics; 2) differences in maternal motivation; 3) differences in exposure to breastfeeding information during prenatal care and/or post-partum; and 4) differences in reasons for choosing the hospital in which to deliver.

The first explanation is unlikely in that women delivering in the two hospitals were remarkably similar with respect to all eleven demographic and biomedical characteristics examined except infant birthweight and incidence of cesarean section (Table 1), neither of which had any within hospital bi-variate relationship with EBF nor changed the regression equation when entered as control variables (Table 5). The second explanation is also unlikely in that neither previous duration of breastfeeding nor planned duration of EBF differed between the two hospitals (Table 2). Furthermore, results of the regression equation did not change when this variable was entered into the model (Table 5).

Although women in the program hospital were more likely to have received breastfeeding information in prenatal care (Table 2), such information was not associated with duration of EBF. Receipt of post-partum breastfeeding information between discharge and the first follow-up visit was associated with both program exposure and EBF at the first follow-up visit (Table 6). Although the inclusion of this variable in the regression model did not change the results, this is likely because of the small number of women ($n=6$) who did not receive such information and hence low statistical power. Because such information was received in the post-partum breastfeeding clinic, the effect of this clinic independent of maternal motivation cannot be ascertained. Although the clinic is likely to be an important component of the program, its specific effects cannot be disentangled from those program activities delivered during hospitalization. Because this third explanation (specifically the difference in post-partum exposure) therefore cannot be rejected, program activities need to be defined as those delivered post-partum as well as those delivered during hospitalization.

The last alternative explanation, self-selection of women into the program hospital who were more motivated to practice optimal breastfeeding behaviors, was addressed by asking women in an open ended question their reason for choosing a particular hospital. Although not a single women reported "breastfeeding" as a basis for hospital choice, 24 women who delivered at the control hospital reported that they did so because the program hospital was full: another 15 did so because an "other" unspecified hospital was full. The prevalence of EBF at either follow-up visit for these groups of women did not differ from those who gave other reasons (Table 3). Furthermore, for all reasons cited that were the same between hospitals such as "excellent hospital" a clear pattern of higher prevalences of EBF among

women in the program is apparent. This suggests that self-selection of women into the two hospitals do not explain the results.

The results of this study are based on quantitative measures of exposure to specific program activities. Such "exposure" is a necessary condition for changes in infant feeding behaviors, however, it may not be a sufficient condition. Although not readily quantified, several qualitative considerations reflective of this program may be equally important. These include the importance of providing emotional (as well as technical) support to breastfeeding women; and the recognition that this can only be accomplished by creating a respectful, positive, and supportive environment for mothers (13). For example, to make the information mothers are receiving from health professionals more acceptable, the program is implemented to provide mothers with time to interchange ideas and experiences among themselves. Mothers show one another directly how to breastfeed or how to solve breastfeeding problems and, thus, become role models for one another. This is thought to enable mothers to trust their own judgement, as well as that of other mothers. It is also thought to teach mothers that they can obtain advice and assistance from one another, and to reduce their reliance on health professionals for infant feeding information.

In conclusion, the similarity between the populations delivering in the program and control hospitals coupled with the vast difference in exposure to breastfeeding promotion activities suggests that the large difference, nearly two months in median EBF duration can be attributed to the breastfeeding promotion program at the program hospital. Replication of this model in other settings, however, should be predicated on the fact that necessary and sufficient conditions for extending the duration of EBF include both "exposure" to specific

program activities and emotional support and positive reinforcement to women during and after hospitalization for childbirth.

REFERENCES

- (1) Victora CG, Smith PG, Vaughan JP, et al. Evidence for protection by breast-feeding against infant deaths from infectious diseases in Brazil. *Lancet* 1987;ii:319-22.
- (2) Brown KH, Black RE, de Romana GL, de Kanashiro HC. Infant feeding practices and their relationship with diarrheal and other diseases in Huascar (Lima), Peru. *Pediatr.* 1989;83:31-40.
- (3) Popkin BM, Adair L, Akin JS, Black R, Briscoe J, Fliieger W. Breast-feeding and diarrheal morbidity. *Pediatr.* 1986;86:874-82.
- (4) Monteiro CA, Zuniga HPP, Benicio MH, Rea MF, Tudisco ES, Sigulem DM. The recent revival of breast-feeding in the City of Sao Paulo, Brazil. *Am J Pub Health* 1987;77:964-6.
- (5) Dimond HJ, Ashworth A. Infant feeding practices in Kenya, Mexico and Malaysia: The rarity of the exclusively breastfed infant. *Human Nutr: Applied Nutr* 1987;11A:51-64.
- (6) Monteiro CA, Zuniga HPP, Benicio MH, Rea MF. Breast-feeding patterns and socioeconomic status in the City of Sao Paulo. *J Trop Ped* 1988;34:186-92.

(13) Fiedler, JL. The Cost of the Breastfeeding Promotion Program in the Guilherme Alvaro Hospital of Santos, Brazil. Manuscript prepared for USAID. International Science and Technology Institute, Washington, DC, 1993.

Table 1			
Maternal characteristics, by hospital			
	Program (n=236)	Control (n=206)	Significance
Maternal age (years, mean±SD)	25.3±6.5	24.6±5.4	
Education (years, mean±SD)	7.3±3.4	7.2±3.5	
Employed (%)	29.2	29.1	
Socioeconomic score ¹ (mean±SD)	3.6±0.9	3.7±0.7	
Living with father of infant (%)	81.3	82.4	
Parity (mean±SD)	2.2±1.6	2.0±1.3	
Primiparae (%)	43.2	43.2	
Received prenatal care (%)	93.6	95.6	
Male infants (%)	53.0	45.6	
Birthweight (g, mean±SD)	3227±467	3386±499	p<0.001
Cesarean section (%)	23.4	49.0	p<0.001

¹Composite indicator of the following household possessions: radio, television, telephone, refrigerator, and car.

Table 2

Maternal motivation, and pre- and post-partum exposure to breastfeeding information¹, by hospital

	Program (n=236)	Control (n=206)	Significance
Breastfeeding duration of previous child ² (months, mean±SD)	10.9±11.8	13.0± 5.7	
Planned duration of exclusive breastfeeding ³ (weeks, mean±SD)	9.2±7.9	9.2±9.5	
Received breastfeeding information in prenatal care (%)	37.1	26.4	p<0.05
Received breastfeeding information, 1st follow-up visit ⁴ (%)	96.8	70.1	p<0.001
Received breastfeeding information, 2nd follow-up visit ⁵ (%)	52.6	47.4	

¹As assessed by maternal recall.

²Multiparae only.

³As proxied by the infant age at which the mother planned to introduce non milk liquids.

⁴Receipt of breastfeeding information between hospital discharge and first follow-up visit.

⁵Receipt of breastfeeding information between the first and second follow-up visits.

Table 3		
Reasons for choice of hospital and exclusive breastfeeding ¹		
	Exclusive breastfeeding (%)	
	Program	Control
<u>Month 1</u> (n=186/166) ²		
Excellent hospital (n=110/34)	58.2	38.2
Friend/relative recommendation (n=17/10)	58.8	20.0
Medical recommendation (n=26/23)	38.5	52.2
Close to home (n=9/22)	66.7	45.5
"Program" hospital full ³ (n=0/24)	—	33.3
Other hospitals full (n=0/15)	—	46.7
Husband works at the port (n=0/16)	—	31.3
Other ⁴ (n=24/22)	41.7	31.8
Within hospital chi square	NS	NS
<u>Month 2</u> (n=168/160)		
Excellent hospital (n=100/32)	46.0	25.0
Friend/relative recommendation (n=15/9)	53.3	22.2
Medical recommendation (n=22/21)	40.9	14.3
Close to home (n=9/22)	55.6	18.2
"Program" ³ hospital full (n=0/24)	—	25.0
Other hospitals full (n=0/15)	—	26.7
Husband works at the port (n=0/16)	—	18.8
Other ⁴ (n=22/21)	27.3	9.3
Within hospital chi square	NS	NS

¹As determined by open ended question during hospital interview.

²Sample size (program/control).

³Program hospital was identified by name.

⁴Includes received prenatal at hospital (n=1/4), gave birth to previous child at hospital (n=6/4), no insurance (n=6/2), high-risk pregnancy (n=2/0), and other responses.

15

Table 4

Program exposure¹, by hospital

	Program (n=236)	Control (n=206)	Significance
Breastfed infant in delivery room (%)	65.3	2.2	p < 0.001
No separations of > 15 min (%)	93.2	68.7	p < 0.001
No prelacteals ² (%)	91.5	56.8	p < 0.001
No formula/glucose water ² (%)	99.6	90.3	p < 0.001
No gifts of formula/glucose water/bottles (%)	100	100	
Talk (%)	87.3	18.0	p < 0.001
Brochure (%)	63.6	40.3	p < 0.001
Help to breastfeed the first time (%)	72.0	33.7	p < 0.001
Demonstration on breast milk expression (%)	68.2	5.4	p < 0.001
<u>Received information on:</u>			
Engorgement (%)	76.3	2.4	p < 0.001
Sore nipples (%)	68.2	2.9	p < 0.001
Knowing if infant receives enough breast milk (%)	49.2	3.9	p < 0.001
Increasing breast milk supply (%)	61.0	5.3	p < 0.001
Where to get post-partum breastfeeding help (%)	72.5	21.1	p < 0.001
Time to introduce liquids (%)	32.6	2.9	p < 0.001
Time to introduce solids (%)	31.8	1.5	p < 0.001

¹As assessed by maternal recall just prior to hospital discharge.

²7.2% and 40.3% of women in the program and control hospitals, respectively, responded "don't know" to this question.

³0.4% and 8.1% of women in the program and control hospitals, respectively, responded "don't know" to this question.

Table 5

Estimates of the effectiveness of the breastfeeding promotion program on exclusive breastfeeding

	B estimate (se)	p value	Median (days)	Benefit (days) ¹	Probability of exclusive breastfeeding		Benefit (per 1000 women) ²	
					1 mo	3 mo	1 mo	3 mo
<u>Model 1</u> ³								
Hospital	-0.368 (0.068)	0.000						
program			75	+53	.64	.46	250	260
control			22		.39	.20		
<u>Model 2</u> ⁴								
Hospital	-0.362 (0.070)	0.000						
program			75	+54	.64	.46	250	260
control			21		.39	.20		

¹Increase in the median duration of breastfeeding (program versus control).

²Number of additional women that would exclusively breastfeed per 1000 women if exposed the program. Calculated at 1 month as follows: (.64 - .39)(1000) = 250.

³Survival analysis (Cox model), n=341.

⁴Multivariate survival analysis (Cox model) controlling for birthweight, type of birth (cesarean section versus vaginal), breastfeeding information in prenatal care (yes versus no) and breastfeeding information between discharge and the first follow-up visit (yes versus no), n=320.

Table 6

Post-partum breastfeeding information and exclusive breastfeeding
at first follow-up visit, by hospital

Exclusive breastfeeding (%)			
	yes (%)	no (%)	Chi-square
<u>Information</u>			
<u>Program</u>			
yes (n=183)	55.2	44.8	p=0.06 ¹
no (n=6)	16.7	83.3	
<u>Control</u>			
yes (n=115)	41.7	58.3	p=0.18
no (n=49)	30.6	69.4	

¹The lack of a strong statistical effect is due to the small number of women who did not receive post-partum breastfeeding information.

Figure 1
Probability of exclusive breastfeeding

Survival curves, by hospital

