

PEDIATRICS®

Breastfeeding and Early Weaning Practices in Northeast Brazil: A Longitudinal Study

Neusa M. Marques, Pedro I. C. Lira, Marilia C. Lima, Nara Lacerda da Silva,
Malaquias Batista Filho, Sharon R.A. Huttly and Ann Ashworth

Pediatrics 2001;108;66-

DOI: 10.1542/peds.108.4.e66

This information is current as of October 20, 2004

The online version of this article, along with updated information and services, is located on the World Wide Web at:

<http://www.pediatrics.org/cgi/content/full/108/4/e66>

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2004 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



Breastfeeding and Early Weaning Practices in Northeast Brazil: A Longitudinal Study

Neusa M. Marques, MD, PhD*; Pedro I. C. Lira, MD, PhD‡; Marilia C. Lima, MD, PhD*; Nara Lacerda da Silva, MSc§; Malaquias Batista Filho, PhD‡; Sharon R.A. Huttly, MSc, MA||; and Ann Ashworth, PhD||

ABSTRACT. *Objectives.* To describe breastfeeding practices from 0 to 12 months of age in 4 small towns that are representative of urban northeast Brazil and to identify factors associated with introduction of other milk in the first month of life.

Methods. From January to August 1998, 364 mothers were interviewed at delivery to ascertain antenatal care; delivery room practices; and their intentions regarding breastfeeding, pacifiers, and introduction of water, teas, and other milk. Their perceptions of home support and the advantages of breastfeeding also were assessed. Thereafter, daily information about feeding practices was collected at twice-weekly home visits. When other milk was started, a second interview was conducted to ascertain initial and current breastfeeding problems and use of a pacifier. Reasons for starting other milk were investigated using 5-point Likert scales.

Results. Mothers were positive toward breastfeeding, and 99% breastfed their new infant. Few intended to breastfeed exclusively, and in the first week 80% gave water/tea and 56% used a pacifier. The median duration of exclusive breastfeeding was 0 days, and the median age for starting other milk was 24 days. The median duration of breastfeeding was 65 days for mothers who started other milk within 1 month and 165 days for other mothers. After adjustment for confounding variables, the main factors associated with introduction of other milk within 1 month were pacifier use in the first week (odds ratio [OR], 4.01; 95% confidence interval [CI]: 2.07–7.78), intention to start other milk in the first month (OR, 3.79; 95% CI: 1.74–8.24), giving water/tea in the first week (OR, 3.07; 95% CI: 1.56–6.03), and leaving the maternity ward before breastfeeding was started (OR, 2.59; 95% CI: 1.34–5.04).

Conclusion. Although breastfeeding is common in this community, it rarely is exclusive and takes place for a relatively short duration. Identification of risk factors for early introduction of other milk offers potential avenues for future intervention, including improvement of breastfeeding support in antenatal and maternity services. *Pediatrics* 2001;108(4). URL: <http://www.pediatrics.org/cgi/content/full/108/4/e66>; *pacifiers, breastfeeding, exclusive breastfeeding, risk factors.*

ABBREVIATIONS. OR, odds ratio; IQR, interquartile range; CI, confidence interval.

The Brazilian national breastfeeding promotion program began in 1981 and was noted for its intensity, coverage, and innovation.¹ Each state organized training for all categories of health professionals and also for traditional healers and others in the nonformal health sector. High-profile mass media campaigns featured national superstars, and legislation was passed on issues such as the advertising of breast milk substitutes and increased maternity leave.² Brazil also has been an active participant in the Baby Friendly Hospital Initiative, and in 1998 there were 103 accredited hospitals.³ Data from national surveys showed an increase in the median duration of breastfeeding from 74 days in 1975 to 167 days in 1989.² In 1996, this figure was estimated to have risen to 210 days.⁴ Despite commendable government policies and Brazil's prominence in breastfeeding promotion, both the duration of exclusive breastfeeding and the total duration remain well below those recommended by the World Health Organization. Venâncio and Monteiro² offered various suggestions to explain this situation, such as contravention of legislation on advertising of breast milk substitutes and inadequate training of health professionals.

In the northeast of the country, the poorest region, the breastfeeding situation is worse than the national picture.⁵ In the mid-1990s, the median duration there was estimated at only 136 days,⁴ and <10% of infants were breastfed exclusively at age 1 month.⁶ Furthermore, data from the state of Pernambuco collected in 1991 and in 1997 showed that although there was some improvement in breastfeeding indicators in the metropolitan area around the capital, Recife, urban areas in the interior showed no such improvement.⁷

The benefits of breastfeeding, especially exclusive breastfeeding, are well established,^{8,9} particularly in poorer environments where the early introduction of other milk is of particular concern because of the risk of pathogen contamination and overdilution of milk leading to increased risks of morbidity and undernutrition.⁹ Thus, there is a need to understand better the factors associated with particular feeding patterns, especially the early introduction of other liquids. This article describes breastfeeding patterns and associated factors in a cohort of 364 newborns in

From the Departments of *Maternal and Child Health and ‡Nutrition and §CISAM/FENSG, Federal University of Pernambuco, Recife, Brazil; and ||Department of Epidemiology and Population Health, London School of Hygiene and Tropical Medicine, London, United Kingdom.

Received for publication Apr 11, 2001; accepted May 31, 2001.

Reprint requests to (A.A.) Public Health Nutrition Unit, London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT, United Kingdom. E-mail: ann.hill@lshtm.ac.uk

PEDIATRICS (ISSN 0031 4005). Copyright © 2001 by the American Academy of Pediatrics.

4 small towns in the interior of Pernambuco, north-east Brazil. In particular, the risk factors for early introduction of other milk are evaluated. Potential actions to improve breastfeeding practices are discussed.

METHODS

Study Site and Population

The study was conducted in 4 small towns in the interior of the state of Pernambuco, northeast Brazil. The largest of the towns, Palmares, has a population of 60 000, and the other 3 towns (Catende, Água Preta, and Joaquim Nabuco) are within a 15-km radius. The economy of the region is based mostly on growing and processing sugar cane, and few work outside this sector. There are a total of 6 hospitals in these towns, and >90% of deliveries occur in them. None is accredited as Baby Friendly. Informed consent was obtained from all mothers, and the research protocol was approved by the Ethical Committees of the Federal University of Pernambuco and the London School of Hygiene and Tropical Medicine.

The sample comprised 364 mothers who delivered in these hospitals during January to August 1998. These mother–infant pairs constituted a subsample of a larger cohort of infants who were born during September 1997 to August 1998 and were being followed prospectively to investigate feeding practices, growth, and morbidity. This cohort comprised all children from the 4 towns who were born with a birth weight of <3000 g and an equal number of those born with a birth weight of \geq 3000 g. Multiple births and those with congenital abnormalities were excluded. For this study of breastfeeding, the 438 cohort children who were born during January to August 1998 were eligible for inclusion except for those who were born with birth weight of <2500 g (42 [9.6%]) as it was believed that their risk factors for early introduction of nonbreast milk may differ from those of the majority of infants. Of the remaining 396 mother–infant pairs, 32 (8%) mothers delivered and were discharged during a weekend and were not available for interview in the maternity ward.

Data Collection

Mothers were recruited in the maternity wards and interviewed on 2 occasions using a semistructured questionnaire administered by 1 of 2 trained interviewers, both with higher education and including 1 of the authors (N.L.S.). The first interview was at the maternity ward within 24 hours of delivery. The aim was to ascertain mothers' intentions regarding breastfeeding; pacifiers; introduction of water, teas, and other milk; and intended total duration of breastfeeding. The first interview also inquired about antenatal care and delivery room practices, particularly in relation to support of breastfeeding. Their perceptions of home support and the advantages of breastfeeding also were sought. The second interview was at home after other milk had been started and established (ie, given at least once every day for 7 days). At this interview, the questions about perceptions of the advantages of breastfeeding and home support were repeated. Initial and current problems pertaining to breastfeeding were ascertained, together with information on use of pacifiers.

In both the first and second interviews, mothers' own explanations about the reasons for starting other milk were investigated, using techniques based on the application of attribution theory.¹⁰ First, a number of plausible reasons for starting other milk or stopping breastfeeding were obtained from the literature and from other research studies in the region. Mothers then were asked to evaluate 28 reasons, using 5-point Likert scales,¹⁰ ranging from 1 (not important at all) to 5 (very important). Conceptually, these reasons belonged to 4 categories: some were related to the mothers themselves (breastfeeding is very tiring, breastfeeding impairs the sleep of the mother at night, breastfeeding takes too much time, breastfeeding makes mother agitated, among others); some were related to the infant (infant who is breastfed cries a lot, infant who is breastfed is always hungry, infant who is breastfed is very slim, among others); some were related to breast milk (breast milk is weak, breast milk has dried up); and some were related to family/peer pressure and the support or lack of support from the father of the infant, from grandmothers, friends, and health professionals, and from advertisements on television and radio.

As part of the main cohort study, mothers also were visited at home by other trained interviewers twice a week for 12 months to collect daily information on breastfeeding and use of water, teas, juices, and other milk and food, using a structured questionnaire. These data were used to establish the ages at which these liquids and foods were introduced and when breastfeeding was terminated.

Definitions

"Exclusive breastfeeding" was defined as breast milk alone (no other liquids or solids). "Duration of exclusive breastfeeding" was defined as the number of days before 2 consecutive days of predominant, partial, or no breastfeeding. "Predominant breastfeeding" was defined as breast milk with water, tea, or juice. "Partial breastfeeding" was defined as breast milk and other milk, with or without other liquids or solids. "Other milk" was defined as nonbreast milk with or without added cereal.

Data Management and Analysis

The questionnaires were checked daily for consistency and completeness. Data were coded immediately after editing. Double data entry was conducted by 2 people independently, using EPI-INFO, version 6.04 (Centers for Disease Control and Prevention, Atlanta, GA) for cross-checking.

Statistical analysis was undertaken with the Statistical Package for the Social Sciences, version 8.0 for Windows (SPSS Inc, Chicago, IL). Percentage distributions of sample characteristics were computed to describe the study group. Durations of feeding patterns were summarized using the median and interquartile range. The odds ratio (OR) was used as a measure of the association between a potential risk factor and the introduction of other milk within the first month of life. Risk factors investigated included sociodemographic and reproductive factors, birth weight, antenatal and delivery care collected at the first interview in the maternity ward, breastfeeding problems, home support and use of pacifier obtained at the second interview, and feeding practices obtained from the twice-weekly follow-up. Factors that had a significance level of 0.2 or less in bivariate analysis were selected for inclusion in multivariate analysis using logistic regression. This multivariate analysis was used to measure the predictive power of each explanatory factor, taking into account the effect of all other explanatory variables. The maximum likelihood ratio test statistic was used to assess the strength of statistical association.

RESULTS

Recruitment and Follow-up

Between the first and second interviews, 19 (5%) of the 364 mother–infant pairs recruited were lost during the follow-up (3 infant deaths, 1 refusal, and 15 moved). Thus, a total of 345 women were interviewed 1 week after the introduction of other milk. A total of 289 mother–infant pairs (79%) completed follow-up until 12 months of age.

Sociodemographic and Delivery Characteristics

The sociodemographic and delivery characteristics of the 364 mothers are shown in Table 1. Half were from families with incomes below the poverty line of 0.5 minimum salaries per caput/mo (equivalent to US \$60), and 44% were illiterate or had difficulty reading. Many were living in environments with limited sanitation and garbage disposal. Most (80%) were cohabiting with the infant's father. For 37% of the sample, this was their first infant, and 36% were adolescents. Most (82%) had received some antenatal care. In 91% of cases, the mother was the primary caregiver.

Attitudes Toward Breastfeeding at Delivery

When interviewed in the maternity ward, mothers were positive toward breastfeeding and aware of its

TABLE 1. Selected Characteristics of the Study Population

| Characteristics | <i>n</i> (<i>n</i> = 364) | % |
|--|-------------------------------|------|
| Per capita family income (minimum salaries)* | | |
| <0.25 | 63 | 18.4 |
| 0.25–0.49 | 108 | 31.5 |
| 0.50–0.99 | 101 | 29.4 |
| ≥1.00 | 71 | 20.7 |
| Literacy | | |
| Illiterate | 70 | 19.2 |
| Difficulty in reading | 89 | 24.5 |
| Literate | 205 | 56.3 |
| Years of schooling | | |
| None | 20 | 5.5 |
| 1–4 | 117 | 32.1 |
| 5–8 | 142 | 39.0 |
| ≥9 | 85 | 23.4 |
| Water supply | | |
| Piped inside home | 309 | 84.9 |
| Sanitation | | |
| Flush toilet | 210 | 57.7 |
| Latrine | 121 | 33.2 |
| None | 33 | 9.1 |
| No garbage collection | 115 | 31.6 |
| Father's cohabitation | 291 | 79.9 |
| Parity | | |
| 1 | 136 | 37.4 |
| 2 | 101 | 27.7 |
| ≥3 | 127 | 34.9 |
| Maternal age (yr) | | |
| 12–19 | 130 | 35.7 |
| 20–34 | 211 | 58.0 |
| ≥35 | 23 | 6.3 |
| Cesarean section | 66 | 18.1 |
| Birth weight (g) | | |
| 2500–2999 | 131 | 36.0 |
| ≥3000 | 233 | 64.0 |
| Antenatal care visits | | |
| None | 66 | 18.1 |
| 1–2 | 103 | 28.3 |
| 3–5 | 145 | 39.9 |
| ≥6 | 50 | 13.7 |

There are 21 missing cases (5.8%).

* 1 Minimum salary = US \$120.

benefits. Almost all (96%) considered breast milk to be better than other milks, and 91% could state correctly at least 1 benefit of breast milk. Most (81%) considered breast milk to be better for the infant's health than other forms of feeding, whereas 17% thought that a combination of breast and other milk was better. Most (89%) also considered breastfeeding to be better for the bonding of mother and infant.

Mothers were less positive about breastfeeding and maternal health than they were about its benefits to infant health: 32% thought that a combination of breast and other milk was better for mothers' health than other feeding methods, and 62% thought that breastfeeding alone was more advantageous. Of the 266 mothers who had breastfed by the time of the maternity interview, 63% reported the experience to be pleasurable, whereas 15% reported that it was uncomfortable.

Breastfeeding Culture and Mothers' Intentions

The study population has a tradition of breastfeeding and no taboo against colostrum. Most mothers reported that they and their siblings had been breastfed as infants. Of those who had had an infant pre-

viously, 81% had breastfed previously and 98% of the sample said that they intended to breastfeed their new infant, but few intended to breastfeed exclusively as 54% intended to start water within the first month and 77% intended to start tea (usually chamomile or fennel). Special small bottles (chuquinha), used for feeding water and tea, were brought to the maternity ward by 51% of mothers and an additional 40% had one at home.

Almost all (83%) intended to use a pacifier, and 68% had brought one to the maternity. An additional 20% had a pacifier at home. Thus, although breastfeeding is the norm in this population, infants usually are given water and teas in bottles, and pacifiers.

When mothers were asked whether they thought that exclusive breastfeeding for 6 months would be easy or difficult, most (66%) thought that it would be difficult. Multiple reasons were given, which tended to pertain to difficulties for the mother, such as its being too demanding and too exhausting, but the needs of the infant for water, tea, juice, and other food also were mentioned widely. Only 37%, however, thought that continuing any breastfeeding for 1 year would be difficult.

In contrast to the clear intentions of most mothers regarding the age when they would introduce water and teas, only 57% said when they intended to start other milk and only 45% said for how long they intended to breastfeed. One fifth of mothers (22%) said that they would start other milk within the first month. Of those who specified duration, 55% said that they would end breastfeeding at 5 to 6 months and an additional 20% said that they would end before 5 months.

Breastfeeding Practice

Figure 1 shows the mothers' actual practice during the first year of their infant's life. Almost all (99%) breastfed. Water/tea was given to 72% of infants on the day of birth and to 80% during the first week; by 4 weeks, this had risen to 88%. Other milk was introduced by 58% of mothers by 1 month. The median duration of exclusive breastfeeding was 0 days (interquartile range [IQR]: 0–2), and the proportion of children who were breastfed exclusively at 4 and 6 months was 1.5% and 0.6%, respectively. The median age for starting other milks was 24 days (IQR: 8–58), with these milks mostly given by bottle. At 6 months of age, 65% of infants were no longer breastfed. Among the 289 children who were followed up for 12 months, 20% were still breastfed at 1 year and their median duration of breastfeeding was 116 days (IQR: 56–298). Pacifiers were given to 56% of infants within the first week, and an additional 18% started within the first month.

Difficulties Encountered

At the second interview, 31% of mothers said that they had experienced difficulties initially with breastfeeding. Most of these (48%) were breast/nipple problems. At this interview, 40% of mothers reported having current problems. These were related primarily to the perceived poor quality or quantity of breast milk (50%).

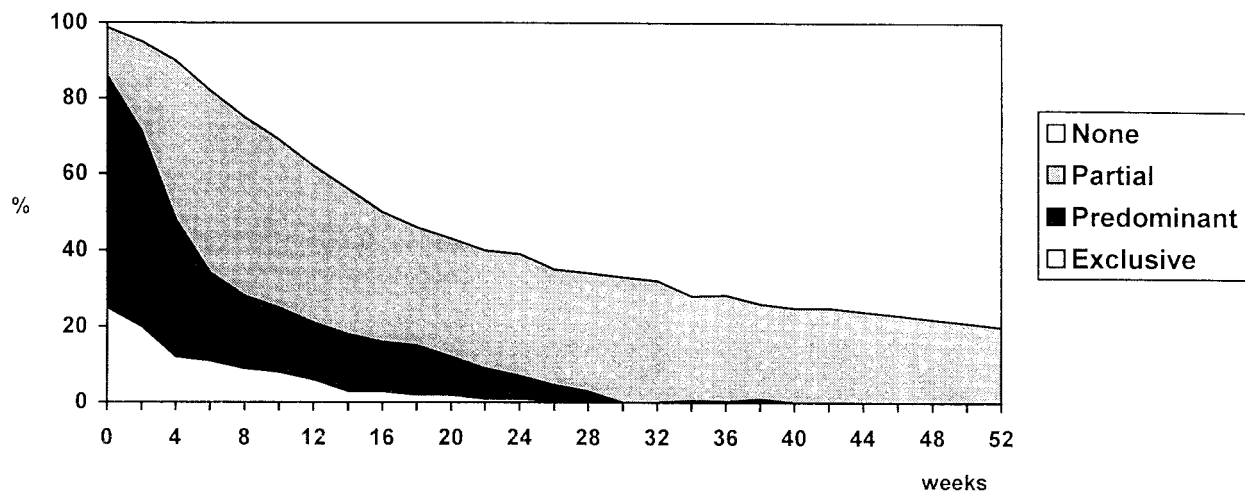


Fig 1. Breastfeeding patterns in the first 12 months of life.

When asked about their decision to introduce other milk, 33% said that it was a difficult decision and 59% said that it was easy. Once the decision was made, 32% felt relieved but 58% were worried.

Changes in Opinion About Breastfeeding at the Second Interview

Questions regarding mothers' opinions about particular aspects of breastfeeding were repeated at the second interview when other milk had been started. Consistent responses were found regarding their enjoyment of breastfeeding, the benefits of breastfeeding for bonding and preventing illness, their opinion about breast milk compared with other milks, and the ease or difficulty of continuing breastfeeding for 1 year. Responses to some questions, however, were less positive on the second occasion. Thus, fewer considered breastfeeding to be better for the nutrition of the infant (down from 74% to 62%) and fewer considered breastfeeding to be better for maternal health (down from 62% to 41%). In each case, the shift was toward a more favorable opinion of a combination of breast and other milk.

Reasons for Starting Other Milk

The reasons that received the highest percentages of "very/fairly important" responses from mothers as to why they started other milk were infant is always hungry (53%), milk has dried up (34%), and infant cries a lot (32%). The reasons breastfeeding makes the mother feel weak, mother needs to go back to work, and mother's food intake is not enough were given as "very/fairly important" by 10% to 16% of mothers. All other reasons received <10% of "very/fairly important" responses. Among mothers who introduced other milk within 1 month, 67% gave "infant always hungry" as a "very/fairly important" reason for introduction, in contrast to 34% of mothers who started other milk later.

Health Service Support

Provision of antenatal care in northeast Brazil has been given considerable priority in recent years, and

coverage has improved markedly. In the study population, 82% of mothers attended antenatal care, 97% of whom reported seeing posters at the clinics promoting breastfeeding and 74% reported receiving breastfeeding advice. However, 34% of these could not recall any of the advice given, and 13% had misconceptions.

Apart from the large metropolitan areas, maternity services in northeast Brazil have been given relatively low priority within the health system and maternities rarely have access to pediatricians. Support for breastfeeding was poor in the maternity wards in the study population. Twenty-six percent of mothers reported having held the infant in the delivery room, and 6% of infants were put to the breast there. Seven percent of mothers received help from staff to start breastfeeding, and 10% received breastfeeding advice in the maternity ward. A high proportion of mothers (27%) were discharged without having started breastfeeding.

When asked about the management of engorged breasts, 18% had been informed what to do by health staff. Nine percent of mothers could give a correct response for the management of cracked nipples.

Media and Family Support for Breastfeeding

When mothers were asked about media promotion, 67% had heard or seen advertisements on the radio or television promoting breastfeeding, and 38% had heard or seen advertisements for other milk for infants.

At the second interview, mothers' perceptions concerning the opinions of their partners and relatives about the pregnancy just completed and about breastfeeding were explored. The perception of the majority of the sample (81%) was that their mothers had accepted the pregnancy favorably and, likewise, 87% of the partners. Mothers and partners were perceived as being in favor of breastfeeding (72%), and 47% of in-laws were. For 67% of the sample, the relationship with the partner was said to be good or very good.

Determinants of Introduction of Other Milk Before 1 Month

In bivariate analyses, 15 maternal and infant explanatory variables were associated with the introduction of other milk during the first month of life, at or below the 0.2 level of statistical significance. These variables were included in multivariate logistic regression analysis; the crude and adjusted ORs are presented in Table 2. The 2 factors most strongly associated with early introduction of other milk were use of a pacifier, especially within the first week

(adjusted OR: 4.01; 95% confidence interval [CI]: 2.07–7.78; $P < .001$), and intention to start other milk during the first month (adjusted OR: 3.79; 95% CI: 1.74–8.24; $P < .001$). Giving water/tea (via a *chinquinha*) in the first week (adjusted OR: 3.07; 95% CI: 1.56–6.03; $P < .001$) and not starting breastfeeding in the maternity ward (adjusted OR: 2.59; 95% CI: 1.34–5.04; $P = .004$) also were significantly associated with early introduction of other milk. Mothers who reported having initial problems with breastfeeding were more likely to start other milk early. Sociode-

TABLE 2. Risk Factors for the Introduction of Other Milk in the First Month of Life ($n = 345$)

| Variables | <i>n</i> | Unadjusted | | Adjusted | |
|--|----------|------------|-------------|----------|-------------|
| | | OR | CI (95%) | OR | CI (95%) |
| Maternal age (y) | | | | | |
| 12–19 | 120 | 1.00 | | 1.00 | |
| 20–25 | 140 | 1.03 | (0.63–1.68) | 1.07 | (0.56–2.03) |
| ≥26 | 85 | 1.50 | (1.85–2.66) | 1.44 | (0.66–3.15) |
| Maternal schooling (y) | | | | | |
| >8 | 83 | 1.00 | | 1.00 | |
| 5–8 | 135 | 1.54 | (0.89–2.67) | 1.14 | (0.54–2.38) |
| ≤4 | 127 | 1.58 | (0.90–2.76) | 1.20 | (0.52–2.76) |
| Income (minimum wage) | | | | | |
| >2 | 134 | 1.00 | | 1.00 | |
| 1–2 | 103 | 0.90 | (0.53–1.51) | 0.79 | (0.42–1.51) |
| ≤1 | 88 | 1.28 | (0.73–2.23) | 0.88 | (0.43–1.80) |
| Missing | 20 | 0.23† | (0.08–1.68) | 0.10‡ | (0.01–0.36) |
| Toilet | | | | | |
| Flush inside | 201 | 1.00 | | 1.00 | |
| Latrine | 144 | 1.27 | (0.82–1.97) | 0.79 | (0.44–1.47) |
| Parity | | | | | |
| Primiparous | 130 | 1.00 | | 1.00 | |
| Multiparous | 215 | 1.29 | (0.83–2.00) | 1.28 | (0.67–2.42) |
| Birth weight (g) | | | | | |
| ≥3000 | 220 | 1.00 | | 1.00 | |
| 2500–2999 | 125 | 0.81 | (0.52–1.26) | 0.89 | (0.51–1.54) |
| Antenatal care visits | | | | | |
| ≥6 | 107 | 1.00 | | 1.00 | |
| 3–5 | 129 | 1.40 | (0.83–2.35) | 1.54 | (0.83–2.88) |
| ≤2 | 109 | 1.51 | (0.88–2.59) | 1.68 | (0.84–3.38) |
| Held baby in delivery room | | | | | |
| Yes | 88 | 1.00 | | 1.00 | |
| No | 257 | 1.05 | (0.64–1.71) | 0.69 | (0.37–1.26) |
| Breastfed in maternity ward | | | | | |
| Yes | 252 | 1.00 | | 1.00 | |
| No | 93 | 3.13‡ | (1.83–5.36) | 2.59† | (1.34–5.04) |
| Intend to start formula (mo) | | | | | |
| ≥1 | 123 | 1.00 | | 1.00 | |
| Do not know | 146 | 1.24 | (0.77–2.00) | 1.20 | (0.68–2.12) |
| <1 | 76 | 3.94‡ | (2.05–7.58) | 3.79‡ | (1.74–8.24) |
| Age when started pacifier | | | | | |
| Not before other milk introduced | 71 | 1.00 | | 1.00 | |
| Before other milk and >7 days of age | 79 | 1.36 | (0.71–2.62) | 1.50 | (0.70–3.22) |
| Before other milk and ≤7 days of age | 195 | 3.76‡ | (2.13–6.63) | 4.01‡ | (2.07–7.78) |
| Age when started water/tea (wk) | | | | | |
| ≥1 | 70 | 1.00 | | 1.00 | |
| <1 | 275 | 3.94‡ | (2.25–6.91) | 3.07‡ | (1.56–6.03) |
| Had problems when started breastfeeding | | | | | |
| No | 39 | 1.00 | | 1.00 | |
| Yes | 106 | 2.55‡ | (1.55–4.18) | 1.94* | (1.06–3.54) |
| Have been having problems with breastfeeding | | | | | |
| No | 207 | 1.00 | | 1.00 | |
| Yes | 138 | 1.87† | (1.20–2.92) | 1.46 | (0.85–2.51) |
| Father encouraged breastfeeding | | | | | |
| Yes | 241 | 1.00 | | 1.00 | |
| No | 104 | 1.12 | (0.70–1.79) | 1.12 | (0.63–1.98) |

* $P < .05$.

† $P < .01$.

‡ $P \leq .001$.

mographic factors, parity, birth weight, and visits for antenatal care were not independent predictors for the early introduction of other milk.

Early introduction of other milk was significantly associated with shorter breastfeeding duration (Mann-Whitney comparison of means, $P < .001$). The median duration was 65 days for mothers who started other milk during the first month, compared with 165 days for other mothers.

DISCUSSION

The general picture gained from this study is typical of that shown by others in Brazil.^{2,5} Although breastfeeding is common, it rarely is exclusive and takes place for a relatively short duration. It also is evident that the substantial breastfeeding promotional efforts made in other parts of the country have failed to reach areas such as these interior towns. This study goes further, however, and offers a number of explanations for this picture and indicators for future intervention.

Many aspects of the study population favored breastfeeding. They intended to breastfeed, were aware of the benefits to their infants, enjoyed breastfeeding, and perceived family approval for their decision. Nevertheless, at delivery, most mothers intended to give water, teas, and pacifiers at an early age and only approximately half had a plan as to when to start other milk or for how long to breastfeed. Early introduction of other milk was strongly associated with earlier termination of breastfeeding.

A key factor associated with the early introduction of other milk was pacifier use, especially in the first week of life. This early use of a pacifier was not associated with nipple problems ($P = .56$). In sucking a pacifier, the infant opens the mouth only a very little and may find it difficult to switch to grasping the breast with a wide-open mouth and establish a normal breast-suckling technique.¹¹ Furthermore, it is possible that using pacifiers in the first week resulted in infrequent suckling and lack of breast stimulation, which in turn reduced breast milk production to such an extent that additional milk was needed. Consistent with this hypothesis is that "infant always hungry" was the most important reason stated for starting other milk before 1 month.

In Sweden, pacifier use was associated with shortened duration of exclusive breastfeeding and shortened overall duration, but the increased risk was small and there was no significant difference in overall duration between those who started a pacifier in the first week and those who did not.¹² The increased risk was similarly small (approximately 1.5) in the United States,¹³ and no impact on early weaning was found in Canada.¹⁴ In southern Brazil, however, a marked effect on the risk of shortened duration was found with a hazard ratio of 3 associated with pacifier use at 1 month.¹⁵ For intense users, the risk increased.¹⁶ We did not assess intensity of pacifier use, but infants in the study population are commonly observed to have pacifiers in their mouth for most of the day. Intensity of pacifier use is likely to explain, at least in part, intercountry differences in risk of shortened duration of breastfeeding. Differ-

ences in sample characteristics also may influence outcome. In the Swedish study,¹² 65% of mothers were university educated and had successfully breastfed previously for at least 4 months and intended to breastfeed for at least 6 months. The US mothers also were privileged and well educated and were offered help with breastfeeding at every follow-up contact.¹³

The use of the *chuquinha* in the first week for feeding water/tea can similarly be expected to interfere with the establishment of a normal breast-suckling technique and hence to a reduction in milk production and early introduction of other milk. Furthermore, the feeding of water/tea could make infants less hungry and hinder establishment of a good milk supply. Our results showed that early introduction of other milk was more likely to occur when water/tea was started in the first week compared with starting later.

Our findings do not support a *laissez-faire* attitude toward pacifiers.¹⁷ Although we accept that proscribing harmless practices would be inappropriate, our view is that pacifiers pose a serious threat to breastfeeding, especially when started early. We believe that strategies are needed to reduce their use. In an ethnographic study in southern Brazil,¹⁶ pacifier use was considered normal behavior and pacifiers were regarded as soothing, pretty, cute, and a symbol of social status. Most mothers (86%) were of the opinion that pacifiers had no effect on breastfeeding, whereas our findings indicate the opposite to be true. Many health professionals in Brazil also have positive attitudes toward pacifiers. Changing social norms about pacifiers will be difficult. In Sweden, however, there has been a declining trend in pacifier use in the first week of life, and there was a sudden drop in 1992 (from 57% to 36%) coincident with the launch of the Baby Friendly Hospital Initiative.¹² In Brazil, a more achievable short-term goal may be to delay their introduction. Formative research is needed to identify approaches and motivational messages for achieving such a goal.

Strategies to reduce the feeding of water/tea, especially in the first week, also are warranted. Although giving water/tea is considered normal behavior in many countries, successful interventions have been implemented, for example, through community peer counselors in Bangladesh.¹⁸

We do not know the reasons for why 22% of mothers intended to start other milks in the first month of life, but it is possible that improved support might persuade at least some of these mothers to delay introduction. Our findings suggest that current support for breastfeeding was poor, and a considerable proportion of mothers experienced problems for which they were insufficiently equipped. Although most mothers attended antenatal care, 47% either received no advice about breastfeeding or could not recall it, and 13% had misconceptions. Mothers who left the maternity ward before having breastfed or who had problems when they started breastfeeding (usually nipple problems) were significantly more likely to introduce other milk before 1 month. Discussions with health service staff have identified a

need and a desire for training on breastfeeding support. Plans for such a training intervention have been developed for implementation in the study area and will address the key risk factors found here for early introduction of other milk, as well as other supportive measures.

Although not all births were sampled for this study, the socioeconomic and demographic characteristics and the feeding patterns of this sample are comparable to those of urban populations in the interior of Pernambuco⁷ and similar to other interior areas of northeast Brazil. Thus, we believe that the findings would apply similarly in other urban interior communities in this region. Methodological strengths of the study include the low loss to follow-up and the prospective twice-weekly collection of infant feeding data, which avoided recall bias and gave precision in identifying the day when other milk was introduced. Methods that were based on the application of attribution theory¹⁰ allowed detailed information on opinions and perceptions, which typically is collected on small subsamples, to be collected for the entire sample and quantified.

CONCLUSION

This study identified areas for future action in the development of breastfeeding promotion in northeast Brazil, which might also prove to be appropriate in similar communities with low rates of exclusive breastfeeding and especially where the use of pacifiers or giving water/tea in *chuquinhas* is common.

ACKNOWLEDGMENTS

Funding was provided by the Brazilian Ministry of Health (Grant No. 25350.001/472/96).

We are grateful to the staff of the 6 maternity wards, the Regional Hospital in Palmares (Fundação Nacional de Saúde), the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), and The British Council and to the 22 field workers, the data clerks, and the participating families.

REFERENCES

1. Rea MF. The Brazilian national breastfeeding programme: a success story. *Int J Gynaecol Obstet.* 1990;3:79–82
2. Venâncio SI, Monteiro CA. A tendência da prática da amamentação no Brasil nas décadas de 70 e 80. *Rev Bras Epidemiol.* 1998;1:40–49
3. Lamounier JA. Experiência iniciativa Hospital Amigo da Criança. *Rev Ass Med Brasil.* 1998;44:319–324
4. BEMFAM. *Pesquisa Nacional sobre Demografia e Saúde (1996). Amamentação e Situação das Mães e Crianças.* Rio de Janeiro, Brazil: BEMFAM; 1997
5. Lamounier JA. Tendências do aleitamento materno no Brasil. *Rev Méd Minas Gerais.* 1999;9:59–65
6. UNICEF. *O Aleitamento Materno e o Município.* Brasília, Brazil: UNICEF; 1995
7. Ministério da Saúde. *II-Pesquisa Estadual de Saúde e Nutrição—Saúde, Nutrição, Alimentação e Condições Sócio-econômicas no Estado de Pernambuco.* Recife, Brazil: 1998
8. Victora CG, Smith PG, Vaughan JP, et al. Evidence for protection by breast-feeding against infant deaths from infectious diseases in Brazil. *Lancet.* 1987;2:319–322
9. Huttly SRA, Morris SS, Pisani V. Prevention of diarrhoea in young children in developing countries. *Bull World Health Organ.* 1997;75:163–174
10. Oppenheim AN. *Questionnaire Design, Interviewing and Attitude Measurement.* London, England: Pinter Publishers; 1997
11. Righard L, Alade MO. Sucking technique and its effect on success of breastfeeding. *Birth.* 1992;19:185–189
12. Aarts C, Hornell A, Kylberg E, Hofvander Y, Gebre-Medhin M. Breast-feeding patterns in relation to thumb sucking and pacifier use. *Pediatrics.* 1999;104(4). Available at: <http://www.pediatrics.org/cgi/content/full/104/4/e50>
13. Howard CR, Howard FM, Lanphear B, deBlicke EA, Eberly S, Lawrence RA. The effects of early pacifier use on breastfeeding duration. *Pediatrics.* 1999;103(3). Available at: <http://www.pediatrics.org/cgi/content/full/103/3/e33>
14. Kramer MS, Barr RG, Jane R, et al. Pacifier use, breastfeeding and infant cry/fuss behavior: a randomized trial [abstract]. *Pediatr Res.* 2000;47:203A
15. Victora CG, Tomasi E, Olinto MTA, Barros FC. Use of pacifiers and breastfeeding duration. *Lancet.* 1993;341:404–406
16. Victora CG, Behague DP, Barros FC, Olinto MTA, Weiderpass E. Pacifier use and short breastfeeding duration: cause, consequence, or coincidence? *Pediatrics.* 1997;99:445–453
17. Schubiger G, Schwarz U, Tonz O, for the Neonatal Study Group. UNICEF/WHO baby-friendly hospital initiative: does the use of bottles and pacifiers in the neonatal nursery prevent successful breastfeeding? *Eur J Pediatr.* 1997;156:874–877
18. Haider R, Ashworth A, Kabir I, Huttly SRA. Effect of community-based peer counsellors on exclusive breastfeeding practices in Dhaka, Bangladesh: a randomised controlled trial. *Lancet.* 2000;356:1643–1647

Breastfeeding and Early Weaning Practices in Northeast Brazil: A Longitudinal Study

Neusa M. Marques, Pedro I. C. Lira, Marilia C. Lima, Nara Lacerda da Silva, Malaquias Batista Filho, Sharon R.A. Huttly and Ann Ashworth

Pediatrics 2001;108;66-

DOI: 10.1542/peds.108.4.e66

This information is current as of October 20, 2004

Updated Information & Services

including high-resolution figures, can be found at:
<http://www.pediatrics.org/cgi/content/full/108/4/e66>

References

This article cites 10 articles, 1 of which you can access for free at:
<http://www.pediatrics.org/cgi/content/full/108/4/e66#BIBL>

Subspecialty Collections

This article, along with others on similar topics, appears in the following collection(s):
Nutrition & Metabolism
http://www.pediatrics.org/cgi/collection/nutrition_and_metabolism

Permissions & Licensing

Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:
<http://www.pediatrics.org/misc/Permissions.shtml>

Reprints

Information about ordering reprints can be found online:
<http://www.pediatrics.org/misc/reprints.shtml>

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

