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Breastfeeding duration in two generations

ABSTRACT

OBJECTIVE: To assess the intergenerational repetition of breastfeeding duration in a cohort of adolescent mothers who had been prospectively followed up since birth.

METHODS: All hospital births occurred in Pelotas (N=5,914), a Southern Brazilian city, in 1982 were studied prospectively. The cohort was visited in 1984 and 1986, and information on feeding practices was gathered. In 2001, a search was conducted in the Live Birth Information System and adolescents born in 1982 who gave birth between January 1995 and March 2001 were identified. Parous adolescents answered a detailed questionnaire on pregnancy-related variables and breastfeeding duration for each child. For multiparous adolescents, the information from the first live born child was used. Poisson regression with robust adjustment of the variance was used in the univariate and multivariable analysis.

RESULTS: A total of 446 parous adolescents belonging to the 1982 cohort were identified, of which 420 (94.2%) were interviewed. After adjustment for confounding variables, mothers who had not been breastfed presented a relative risk of 1.34 (95% CI: 0.35; 5.18) of not breastfeeding their children, compared to mothers who were ever breastfed. Similarly, adolescents who were breastfed for less than one month were slightly – but not significantly – more likely to fail to breastfeed their own infants (RR=1.64; 95% CI: 0.70; 4.03). The proportion of adolescent mothers who breastfed for less than six months was higher among those who were themselves breastfed for less than one month (PR=1.29; 95% CI: 1.02; 1.62)].

CONCLUSIONS: Duration of breastfeeding is slightly higher among infants whose mother was breastfed.

KEYWORDS: Breast feeding. Pregnancy in adolescence. Intergenerational relations. Risk factors. Cohort studies. Cohort effects.

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INTRODUCTION

Breastfeeding has a clear beneficial effect on the health of infants and young children, reducing mortality and morbidity from infectious diseases, especially in developing countries.[17] Its promotion is regarded as one of the most effective interventions for child survival.[8] Despite such evidence, the durations of exclusive and of total breastfeeding in many areas of the world remain substantially shorter than that recommended by the World Health Organization.[9,*]

Knowledge about the determinants of the initiation and duration of breastfeeding is important to design promotion interventions. Evidence is available on socio-demographic, psychosocial, environmental, and maternal health related determinants of breastfeeding.[5,7,14] On the other hand, a potential intergenerational effect of breastfeeding duration has been poorly investigated, with studies reporting an increased incidence of breastfeeding among infants whose mothers were breastfed.[6,10-13] With respect to breastfeeding duration, the evidence is controversial. Whereas three studies[3,4,13] reported an increased risk of early weaning for children whose mothers had not been breastfed, others failed to observe an association. All of these studies have gathered information on maternal breastfeeding duration from the mother themselves, i.e., relying on maternal recall, and are therefore susceptible to information bias.[11,16]

In view of the conflicting evidence and the public health importance of elucidating the factors associated with breastfeeding duration, we decided to assess the intergenerational transmission of breastfeeding in a cohort of adolescents who have been prospectively followed up since birth. Information on duration of breastfeeding for these mothers was collected in early childhood.

METHODS

Pelotas (current population 320,000) is a relatively affluent city in southern Brazil, located near the border with Uruguay. The population is mostly of European background. The mean annual gross domestic product per capita is about US$2,700, and infant mortality in 1982 was 38 per thousand. Children born in 1982 have been followed up on a number of occasions.[2,15] The study started as a perinatal health survey including all 5,914 infants born alive in the three maternity hospitals (over 99% of all live births in the city). In the follow-up visits, the infants were weighed and their mothers interviewed on socioeconomic, demographic and health-related variables.

In 1984 and 1986 all households in the city were visited in search of cohort children; 87% and 84% of the original cohort were located. Standardized interviews were carried out in each round, including detailed information on feeding practices and duration of breastfeeding. We used the earliest available information in order to minimize recall bias.

In 2001, we searched the *Sistema de Informações sobre Nascidos Vivos* (SINASC - Live Birth Information System), of the Brazilian Ministry of Health, and identified all mothers who gave birth in Pelotas between January 1995 and March 2001. The system's coverage is close to 100%, as it is not possible to register a child unless a SINASC form was completed. This computerized system provides information on maternal age but not on date of her birth. All women who gave birth from January 1995 to March 2001 and whose age was compatible with having been born in 1982 were flagged. Hospital delivery records for their children were then sought in maternity hospitals. Unlike SINASC, these records provide information on the date and place of birth of the mother.

Parous adolescents identified through this process were visited at home and answered a detailed questionnaire on pregnancy-related variables, including gestational age, perinatal morbidity, type of delivery, birth weight and length, delivery care, Apgar score, and breastfeeding duration for each child. For multiparous women, we used information from the first live born child. In addition, adolescents and their mothers answered a standard socio-demographic questionnaire.

Interviewers were unaware of the objectives of the study. Quality control included the repetition of approximately 5% of all interviews by a fieldwork supervisor. In addition, data were coded daily by interviewers and revised by the supervisor. Data were entered twice.

The study outcomes were the incidence of breastfeeding (having received any maternal milk, regardless the duration and of the introduction of additional feeds), and cessation of breastfeeding before six months.

We used standard definitions of breastfeeding to classify maternal breastfeeding duration.[18] The following explanatory variables were studied:

*World Health Organization. Global data bank on breastfeeding; 2003. Available from http://www.who.int/nutrition/databases/infantfeeding/en/index.html [access in 2006 Nov 10]

Table 1 - Distribution of the sample of adolescent mothers according to socioeconomic, demographic and breastfeeding characteristics measured in 1982. Maternal variables correspond to the mothers of the adolescents. Pelotas, RS, 1982.

Variable	%	N
Family income in minimum wages		
≤3	58.3	210
3.1-6	26.1	94
6.1-10	10.0	36
>10	5.6	20
Maternal age at delivery in years		
≤15	22.1	93
16	25.5	107
17	31.0	130
≥18	21.4	90
Maternal schooling in years		
≤4	19.5	80
5-8	55.2	227
≥9	25.3	104
Ever breastfed		
Yes	4.4	18
No	95.6	387
Breastfeeding duration in months		
<1	18.3	74
1-2.9	28.9	117
3-5.9	21.0	85
6-8.9	7.9	32
≥9	24.0	97
Total*	100.0	420

*Total numbers do not add to 420 owing to missing information

- Maternal incidence of breastfeeding (as for the child's breastfeeding);
- Maternal breastfeeding duration in infancy (classified as <1 month; 1-2.9, 3-5.9, and ≥6 months). In this variable, mothers who were never breastfed were grouped with those breastfed for <1 month, due to evidence of misclassification between infants who were never breastfed or who were breastfed only for a few days.

All statistical analyses were performed using Stata version 8.0 for Windows. Since the proportion of children who stopped breastfeeding in the first six months of life was high and the odds ratio would overestimate the prevalence ratio, a Poisson regression with robust adjustment of the variance was used in the univariate and multivariable analysis,[1] in instead of logistic regression.

RESULTS

In all, 446 parous adolescents belonging to the 1982 cohort were identified. Among these, there were three refusals, and 23 adolescents could not be located. This resulted in a sample of 420 parous teenagers (94.2% of those identified) who had delivered at least one live born infant. Information on incidence of breastfeeding and breastfeeding at six months was available for 405 and 372 children, respectively. The lower number of observations at the age of six months is due to censored observations, that is, children who were younger than six months when their mothers were interviewed.

Table 1 shows results from the perinatal study (1982). About six of every ten infants lived in families whose monthly income was lower or equal to three minimum wages. Maternal schooling was low, 19.4% of the mothers had less than five years of schooling. Initiation of breastfeeding was nearly universal, 95% of the 1982 sample were breastfed. But the duration of breastfeeding dropped off sharply, and only one of every three children were breastfed for six or more months. The median breastfeeding duration was 3.3 months.

As observed in 1982, initiation of breastfeeding in the next generation was high, but duration was often short (Table 2). Whereas 91,8% of the infants were initially breastfed, only 35.5% were still breastfeeding by six months. The median duration of breastfeeding was 4.7 months.

Crude and adjusted relative risks for non-initiation of breastfeeding are presented in Table 3. Although the associations did not reach statistical significance, they were in the expected direction. The proportion of infants who were never breastfed was 1.34 (95% CI: 0.35; 5.18) times higher for those whose mother had also not been breastfed, relative to infants from ever breastfed mothers. Similarly, mothers who were breastfed themselves for less than one month also presented a somewhat higher risk of not breastfeeding their infants relative risk: 1.64 (95% CI: 0.70; 4.03). On the other hand, there was no linear trend with the variable expressing the mothers' total breastfeeding duration in infancy.

Table 4 shows that infants whose mothers were breastfed for less than one month presented an increased risk of stopping breastfeeding in the first six months of life (prevalence ratio 1.29; 95% CI: 1.02; 1.62). This association remained after controlling for possible confounding variables (maternal age, family income and maternal schooling). Moreover, the proportion of children who were breastfed for six or more months tended to increase, as maternal duration of breastfeeding in infancy increased.

Table 2 - Second Generation Children's breastfeeding duration. Pelotas, RS, 1995-2001.

Variable	%
Child was ever breastfed	91.8
Breastfeeding duration in months	
<1	18.1
1-2.9	22.1
3-5.9	24.3
≥6	35.5

Table 3 - Proportions of infants who were never breastfed according to their mothers' breastfeeding duration in infancy. Pelotas, RS, 1982,1995-2001.

Variable	N	Child was never breastfed (%)	Relative risk of non-breastfeeding (95% CI) Crude	Adjusted*
Mother was breastfed		p=0.61**	p=0.61	p=0.42
Yes	387	7.8	1.00	1.00
No	18	11.1	1.43 (0.37; 5.54)	1.34 (0.35; 5.18)
Mother was breastfed for 30 days or more		p=0.13**	p=0.13	p=0.19
Yes	331	7.0	1.00	1.00
No	74	12.2	1.75 (0.84; 3.63)	1.64 (0.79; 3.42)
Mother's breastfeeding duration (months)		p=0.52**	p=0.32***	p=0.34***
<1	74	12.2	1.74 (0.72; 4.20)	1.68 (0.70; 4.03)
1-2.9	117	6.8	0.98 (0.39; 2.46)	1.02 (0.41; 2.49)
3-5.9	85	7.1	1.01 (0.37; 2.74)	1.07 (0.39; 2.97)
≥6	129	7.0	1.00	1.00
Total	405			

*Adjusted for: maternal age, family income and maternal schooling
**Test for heterogeneity
***Test for linear trend

We sought interactions between breastfeeding and several other factors related to socioeconomic status (skin color, family income and maternal schooling), maternal age at delivery, and presence of the grandmother in the house where the adolescent mother lives. There was no evidence that any of these variables modified the effect of mothers' breastfeeding duration in infancy on initiation and duration of breastfeeding (all p-levels for interaction >0.2).

DISCUSSION

To our knowledge, this is the first study to assess the intergenerational effect of breastfeeding duration using a prospective design. Information on the mothers' own infant feeding patterns and on confounding variables were collected in the early phases of the cohort study. Therefore, recall bias may be ruled out. With respect to selection bias, live births were identified on the information system (SINASC). Comparison between the number of births reported by SINASC and actual births – assessed through daily hospital visits – shows that coverage is virtually 100%. Finally, we managed to interview 94.2% of the mothers identified. For this reason, selection bias is also unlikely.

Unlike previous reports,[6,10-13] the association between the mother having been breastfed and initiation of breastfeeding in the next generation was not statistically significant. On the other hand, the magnitude of the relative risk was similar to that reported by other studies. In our cohort breastfeeding initiation was close to 92%, whereas in other study settings its incidence ranged from 38% to 85%; this means that our statistical power to detect this association was considerably smaller. The consistency of the relative risk with previous studies supports the hypothesis that the mothers' decision to breastfeed their infants is influenced by the mothers' own experience.

In spite of a lower magnitude of the effect (prevalence ratio) than for breastfeeding initiation, the as-

Table 4 - Prevalence ratio and 95% confidence interval for breastfeeding less than six months according to the mothers' breastfeeding duration in infancy. Pelotas, RS, 1982, 1995-2001.

Variable	N*	Child stopped breastfeeding by age of six months* (%)	Prevalence ratio (95% confidence interval) Crude	Adjusted**
Mother was breastfed		p=0,44***	p=0,44	p=0,31
Yes	356	60,1	1,00	1,00
No	16	68,8	1,14 (0,81; 1,61)	1,11 (0,80; 1,53)
Mother was breastfed for 30 days or more	p=0,06***	p=0,06	p=0,08	
Yes	306	58,5	1,00	1,00
No	66	69,7	1,19 (0,99; 1,43)	1,18 (0,98; 1,42)
Mother's breastfeeding duration (months)		p=0,29***	p=0,07****	p=0,08****
<1	66	69,7	1,29 (1,02; 1,62)	1,27 (1,02; 1,60)
1-2.9	108	59,3	1,09 (0,87; 1,37)	1,10 (0,87; 1,37)
3-5.9	78	64,1	1,18 (0,94; 1,50)	1,21 (0,96; 1,53)
≥6	120	54,2	1,00	1,00
Total*	372	61,1		

*Those infants aged less than six months were excluded
**Adjusted for: maternal age, family income and maternal schooling
***Test for heterogeneity
****One tailed test for linear trend

sociation between the mothers' breastfeeding duration and proportion of children who were weaned less than six months was statistically significant. Infants whose mothers were breastfed for less than 1 month presented a 27% higher risk of stopping breastfeeding in the first six months of life.

No interactions between maternal breastfeeding patterns and socioeconomic variables were identified. In particular, there is a common notion among Brazilian pediatricians that if the grandmother was not successful in breastfeeding her daughter, she is likely to interfere with the latter's nursing of her infants, and vice-versa. We found no evidence of a stronger intergenerational effect of breastfeeding in households including the grandmother, mother and infant.

Our results support the hypothesis that the duration of breastfeeding increases when the mother herself has been breastfed for longer periods. The fact that breastfeeding initiation was nearly universal in our cohort limited the statistical power to detect an association, but the magnitude of a positive effect – albeit non-significant – was similar to that reported in the literature.

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