Prevalence and factors associated with tea consumption in the first month of life in a birth cohort in the Northeast Region of Brazil

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Abstract

Objectives: to determine the prevalence and analyze the factors associated with newborns drinking tea in a birth cohort.

Methods: A cross-sectional study with nested prospective cohort was conduct with 329 puerperal women and their newborns in Vitória da Conquista, Bahia. Sociodemographic and information about the newborn's diet and mothers/babies was obtained at a maternity and 30 days after birth, at home visits. The prevalence ratios (PR) and its respective confidence intervals (CI95%) were estimated with Poisson regression models according to the hierarchical conceptual model.

Results: the prevalence of tea consumption up to 30 days of life was 34.6% (CI95%=29.7; 40.0%). The sociodemographic and maternal characteristics associated with the outcome were not having a partner (PR = 1.39; CI95%=1.03-1.88), more than eight years of schooling (PR=1.38; CI95%=1.03-1.84), lower income (PR=2.21; CI95%=1.31-3.73), primiparous (PR=1.48; CI95%=1.01-2.17) and does not have any experience with breastfeeding before (PR=2.25; CI95%=1.48-3.41). As for the child, there was a higher prevalence of tea consumption than among those who received artificial milk in the first month of life (PR=2.10; CI95%=1.62-2.73).

Conclusions: the offer of tea in the first month of life was high. Tea consumption was positively associated with sociodemographic, maternal and newborn feeding factors.

Key words *Herbal tea, Newborn, Infant nutrition, Artificial feeding*

Introduction

An early introduction of non-nutritious fluids, such as tea, in children's diet younger than six months is considered inadequate and harmful to their health, it is a cultural practice widely spread among the Brazilian population.[1-3] The prevalence of this practice ranges from 16.2% to 68.8% in the first month of children's lives.[4-7]

Giving tea to babies can increase the risk of food poisoning, since plants synthesize secondary metabolites as a defense mechanism when they interact with other plants and these naturally produced substances can have toxic/mutagenic potential.[8] These fluids can also be contaminated with enteropathogens, whose intake is associated with a higher risk of morbidity and mortality in the first six months of children's lives.[9]

Besides lacking important nutrients for children's development and growth in its composition, different types of tea often provided to them present substances capable of compromising the bioavailability of different breast milk-related minerals.[10] Giving tea to babies can lead in reducing their appetite and breast suction, a fact that may decrease mothers' milk production and interrupt breastfeeding.[11]

Factors such as low maternal schooling, young mothers, pacifier and bottle, and shorter exclusive breastfeeding time have been associated with the early introduction of tea, or of other fluids such as water and/or fruit juice, in children's diet younger than one year old.[3,12-15]

Despite the high prevalence, and consequences, of tea consumption, national studies about factors associated with tea introduction in babies' diet remain scarce.[3,12] Understanding these factors is of paramount importance to help reduce tea consumption in order to avoid complications in children's health. This study analyzed the prevalence and factors associated with tea consumption in newborns' diet, in a birth cohort study carried out in Vitoria da Conquista-BA, an important urban center in the Northeast region in Brazil.

Methods

A sectional study nested in a prospective birth cohort research carried out in Vitória da Conquista – BA, which is the third largest countryside in the State and the fifth largest countryside in the Brazilian Northeast region - its population in 2020 comprises 341,128 inhabitants.[16]

Mothers who participated in this cohort study were recruited within 24 hours after childbirth, from all the maternity hospitals that provided public and/or private assistance in the countryside and they were followed-up through home visits conducted from February 2017 to October 2018. Eligibility criteria comprised puerperal women living in the urban area of the countryside, who delivered non-twin children and at term. Children born from HIV-positive mothers and children presenting malformations capable of compromising breastfeeding were excluded from the study.

Information about sociodemographic conditions, other maternal features, prenatal care and childbirth were collected based on a questionnaire applied to mothers at the time they stayed at the maternity hospitals.

Children were followed-up through home visits carried out at 30, 180 and 365 days after childbirth in order to collect information about the children (care provided to the child, breastfeeding, complementary feeding introduction, pacifier and bottle using, and the child's health conditions). Some children were visited later than scheduled due to mothers' availability for the interview.

In this current study, data were collected at the maternity and the babies' 30th day of life, from February to November 2017. Interviews were conducted by trained researchers in order to standardize data collection procedures and to avoid errors in the collected information.

The sample size was calculated (a posteriori) based on the following parameters: prevalence on tea consumption was 16.2% in children younger than 30 days old and lived in the Brazilian Northeast region,[6] odds ratio of 1.6, 80% power and 95% confidence level - minimum sample size comprised 275 binomial mothers/babies.

Mothers' report about any tea intake by children in their first 30 days of life ("Has the baby had tea yet?") was the dependent variable. Information about children's age at the time tea was first consumed, daily tea intake, the reason why tea was offered and whether mothers were instructed by someone to offer children tea were also collected.

Independent variables were selected based on studies about the topic; they were arranged in three blocks, based on hierarchical conceptual model, namely: distal block (sociodemographic and maternal characteristics), intermediate block (variables related to prenatal and maternal care) and proximal block (variables related to the child and maternal breastfeeding) [Figure 1].

Independent variables belonging to the distal block were: maternal age (categorized as ≥ 20 years

old and < 20 years old); maternal skin color (white and non-white); maternal marital status (with a partner - married, cohabiting; and without a partner - single, divorced, widow); maternal schooling (>8 years and ≤ 8 years of schooling); economic classification based on the criterion suggested by the *Associação Brasileira de Empresas de Pesquisa* (ABEP)[17] (Brazilian Association of Research), categorized in classes A, B and in classes C, D, E (women classified in the last category were assumed to have low income); number of children (multiparous and primiparous) and previous breastfeeding experience (yes / no).

Variables belonging to the intermediate block were categorized as follows: number of prenatal consultations (≥ 6 consultations and < 6 consultations); participation in pregnancy support group (yes/no); instructions about breastfeeding during prenatal care (yes/no); type of delivery (vaginal and cesarean section) and the use of bottle at the hospital (yes/no).

Variables belonging to the proximal block comprised birth weight (≥ 2,500 g and < 2,500 g); type of feeding in the babies first month of life (breastfeeding; artificial milk); breast issues and the use of pacifier in the babies first month of life

(yes/no).

Statistical analyzes were carried out on Stata software, version 14.0. The frequency of distribution on the characteristics of the population such as sociodemographic, obstetric and neonatal factors were described in the current study.
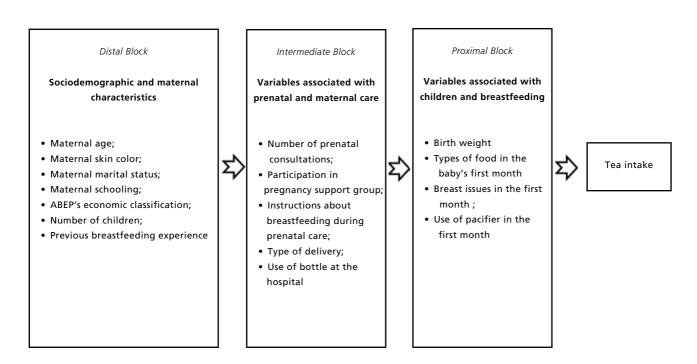
Gross and adjusted associations between predictor variables and outcome were analyzed through robust-variance Poisson regression, whereas effect magnitude was estimated by calculating the gross/adjusted prevalence ratio (PR). Gross prevalence ratios of investigated factors-event association were initially estimated. Next, multivariate regression analysis was performed based on the proposed hierarchical conceptual model. Variables associated with the event at significance level of $p \leq 0.20$, in the bivariate analysis, were included in multiple regression models.

Variables belonging to each block and to hierarchically superior blocks were adjusted through variables belonging to the following block. Variables presenting significance level of $p \leq 0.05$ remained in the final model, in their respective adjustment block, regardless of whether, or not, they lost statistical significance in the following block.

The current research met the ethical aspects of

Figure 1

Conceptual hierarchical model of factors associated with tea introduction in babies' diet in their first 30 days of life.

ABEP = *Associação Brasileira de Empresa de Pesquisa* (Brazilian Association of Research).

studies involving human beings, which are ruled by the *Conselho Nacional de Saúde* (CNS) (National Health Council) resolution n. 466/12. In addition, it was approved by the Research Ethics Committee at *Universidade Federal da Bahia / Instituto Multidisciplinar em Saúde* (UFBA/IMS), under the protocol number 1.861.163. Data collection took place by puerperal women who signed the Informed Consent Form (ICF).

Results

The initial cohort comprised 388 mother-baby pairs. Follow-up loss reached 15.2% (n=59), which resulted in the total number of 329 puerperal women and their newborns - who were examined at the first scheduled visit (30 days after childbirth). The afore-mentioned loss resulted in the impossibility of making contact with mothers' over the phone, wrong address and mothers' change of address to other cities or to the rural area of the countryside.

As for the mothers' characteristics, most of them were non-white (75.7%), 20 years old or older (87.8%), belonged to lower economic class (72.3%) and had a partner (77.8%). The lack of previous breastfeeding experience was reported by 54.7% of interviewees (Table 1).

Information shown in Table 2 refers to characte-ristics associated with prenatal and maternal care. 80.6% of the puerperal women attended six or more prenatal consultations, 70.0% received instructions about breastfeeding during these consultations and 73.2% did not participate in pregnancy support groups. Cesarean section (53.5%) was the most frequent type of delivery; 91.7% of the babies did not use a bottle at the maternity hospital.

In relation to newborns, 50.8% were boys, mean birth weight was 3,215.6 ± 413.0 grams and 4.3% of the babies presented low birthweight. Most children were breastfed (73.6%) and used pacifier (51.1%). In addition, 55.0% of the mothers reported not having breast issues (Table 3).

Tea consumption by babies in their first 30 days of life presented a prevalence of 34.6% (CI95%=29.7%; 40.0%); the mean age of the babies at the time tea was introduced to them was 18.9 ± 8.3 days. Most mothers reported giving tea was recom-mended by a family member (61.4%) their own deci-sion in giving their babies tea (26.3%), and 12.3% was due to the physician or by other health profes-sionals' recommendation. The reasons reported by mothers for giving their babies tea were incidence of colic and gas (74.6%), constipation (7.0%), to calm their child (4.4%), among other reasons (14%) such

as a cold, jaundice, reflux, lack of milk and for a matter of habit. In relation to the daily frequency of giving tea to babies, most mothers reported doing it once a day (78.1%), 14% did it twice a day and 7.9%, three, or more, times a day.

Based on the univariate analysis, all variables in the distal block - except for maternal age and skin color - were associated with tea consumption (Table 1). In relation to the variables in the intermediate block, "number of prenatal consultations" and "participation in pregnancy support group" were included in the multivariate model (Table 2). As for the proximal block, variables "types of feeding baby" and "the use of pacifier" in the first 30 days of a baby's life were included in the model (Table 3).

Based on the multivariate analysis, lower maternal schooling (PR=1.38; CI95%=1.03-1.84), mothers without a partner (PR=1.39; CI95%=1.03-1.88), lower economic class level (PR=2.21; CI95%=1.31-3.73), primiparous mothers (PR=1.48; CI95%=1.01-2.17) with no previous breastfeeding experience (PR=2.25; CI95%=1.48-3.41) and chil-dren used a bottle in their first 30 days of life (PR=2.10; CI95%=1.62-2.73) all remained posi-tively associated with the outcomes in the study. No intermediate level variable remained significant in its respective block (Table 4).

Discussion

Approximately one third of the study population consumed tea in their first month of life. This preva-lence was even higher in children born from mothers' who had low-income and schooling, did not have a partner, who were primiparous and did not have breastfeeding experience. In addition, children who used artificial milk presented a higher tea consumption.

The prevalence of tea consumption in the chil-dren's first month of life has exceeded the preva-lence observed in the *II Pesquisa de Prevalência do Aleitamento Materno nas Capitais Brasileiras e Distrito Federal* (34.6% *vs*. 15.3%).6 (II Survey about Breastfeeding Prevalence in Brazilian Capitals). However, studies carried out in Goiânia and Viçosa cities have found prevalence of tea consumption similar to the present study: 32.6%[18] and 36.8%,[19] respectively.

Most mothers in the present study reported the incidence of colic and gas in their children as the reason to give tea. The early introduction of tea in Brazilian children's diet can be explained by the belief in its medicinal functions, namely[4]: mitigating infantile colic[5,18] and earache, preventing and

Table 1

Gross prevalence and prevalence ratio (PR) of tea consumption in the babies' first month of life, according to sociodemographic and maternal characteristics. Vitória da Conquista, BA, Brazil, 2017. (n=329).

Variables	N	%	Prevalence of tea consumption (%)	PRa (gross)	CI95%b	*p*
Maternal age (years)						
≥ 20	289	87.8	33.56	1		
< 20	40	12.2	42.50	1.27	0.85-1.88	0.243
Maternal skin color						
White	80	24.3	30.00	1		
Non-white	249	75.7	36.14	1.20	0.83-1.75	0.329
Maternal marital status						
With a partner	256	77.8	30.08	1		
Without a partner	73	22.2	50.68	1.69	1.26-2.26	0.001
Maternal schooling (years)						
> 8	245	74.5	29.80	1		
≤ 8	84	25.5	48.81	1.64	1.22-2.19	0.001
Economic classification (ABEP)						
Classes A/B	91	27.7	15.38	1		
Classes C/D/E	238	72.3	42.02	2.73	1.65-4.53	<0.001
Number of children						
Multiparous	169	51.4	30.77	1		
Primiparous	160	48.6	38.75	1.26	0.93-1.70	0.131
Previous breastfeeding experience						
Yes	149	45.3	26.17	1		
No	180	54.7	41.67	1.59	1.16-2.19	0.005

a PR= prevalence ratio; b CI95% = 95% confidence interval; ABEP = *Associação Brasileira de Empresa de Pesquisa* (Brazilian Association of Research).

Table 2

Gross prevalence and prevalence ratio (PR) of tea consumption in the babies' first month of life, according to prenatal and childbirth care characteristics. Vitória da Conquista, BA, Brazil, 2017. (n=329)

Variables	N	%	Prevalence of tea consumption (%)	PRa (gross)	CI95%b	*p*
Number of prenatal consultations						
≥ 6 consultations	265	80.6	32.45	1		
< 6 consultations	64	19.4	43.75	1.35	0.97-1.87	0.074
Participation in pregnancy support group						
Yes	88	26.8	42.05	1		
No	240	73.2	32.08	0.76	0.56-1.04	0.084
Instructions about breastfeeding during prenatal care						
No	98	30.0	30.61	1		
Yes	229	70.0	36.68	1.20	0.85-1.69	0.302
Type of delivery						
Vaginal	153	46.5	32.68	1		
Cesarean section	176	53.5	36.36	1.11	0.82-1.50	0.486
Use of bottle at the hospital						
No	300	91.7	33.67	1		
Yes	27	8.3	44.44	1.32	0.84-2.07	0.228

a PR= prevalence ratio; b CI95% = 95% confidence interval.

Table 3

Gross prevalence and prevalence ratio (PR) of tea consumption in the babies' first month of life, according to children's and characteristics and maternal breastfeeding. Vitória da Conquista, BA, Brazil, 2017. (n=329)

Variables	N	%	Prevalence of tea consumption (%)	PR[a] (gross)	CI95%[b]	*p*
Birth weight (g)						
≥ 2.500	315	95.7	35.24	1		
< 2.500	14	4.3	21.43	0.61	0.22-1.68	0.337
Food type in the baby's first month						
Maternal Breastfeeding	242	73.6	25.62	1		
Artificial milk	87	26.4	59.77	2.33	1.77-3.07	<0.001
Breast issues in the first month						
No	181	55.0	32.60	1		
Yes	148	45.0	37.16	1.14	0.85-1.53	0.387
Use of pacifier in the first month						
No	161	48.9	29.81	1		
Yes	168	51.1	39.29	1.32	0.97-1.78	0.074

[a] PR= prevalence ratio; [b] CI95% = 95% confidence interval.

Table 4

Factors associated with tea consumption in the babies' first month of life. Vitória da Conquista, Bahia State, Brazil, 2017 (N=329)

Variables	PR[a] (adjusted)	CI95%[b]	*p*
Distal Block: Sociodemographic and maternal characteristics[c]			
Maternal schooling (years)			
> 8	1		
≤ 8	1.38	1.03-1.84	0.030
Maternal marital status			
With a partner	1		
Without a partner	1.39	1.03-1.88	0.031
Economic classification (ABEP)			
Classes A/B	1		
Classes C/D/E	2.21	1.31-3.73	0.003
Number of children			
Multiparous	1		
Primiparous	1.48	1.01-2.17	0.045
Previous breastfeeding experience			
Yes	1		
No	2.25	1.48-3.41	<0.001
Proximal Block: Children's characteristics and maternal breastfeeding[d]			
Type of food in the baby's first month			
Maternal Breastfeeding	1		
Artificial milk	2.10	1.62-2.73	<0.001

[a] PR= prevalence ratio; [b] CI95% = 95% confidence interval; [c] Adjusted between sociodemographic and maternal variables (distal block); [d]Adjusted between sociodemographic and maternal variables (distal block) and variables associated with children and maternal breastfeeding (proximal block); ABEP = *Associação Brasileira de Empresa de Pesquisa* (Brazilian Association of Research).

treating cold, and hydrating children.[20] On the other hand, based on a study conducted with American mothers, the main reasons to give tea to babies was to calm them, help on the digestion processes and treating colic.[21]

Sociodemographic factors such as low schooling and income level were associated with the introduction of tea in the children's first month of life in the present study. This outcome corroborates the study carried out in five Brazilian macro-regions,[1] which has shown association between low maternal schooling and giving tea to babies in their first 30 days of life. Several national and international studies have found association between economic indicators and early introduction of fluids and other types of food.[3,4,22] Such an early introduction may be associated with women's lower access to information about healthy eating practices and with their slight difficulty in reading and understanding educational materials provided by the health services.[23] It was also suggested that the lack of knowledge in association with low socioeconomic level, makes several mothers see teas as natural remedies; consequently, they attribute important functions to them, such as mitigating infantile colic and gas.

The early introduction of fluids and/or solid food in babies' diet can lead to shorter breastfeeding time, affect the absorption of breast milk nutrients, as well as increase the likelihood of contamination and allergic reactions.[24]

Mothers who did not have previous breastfeeding experience gave higher amount of tea to their babies in their first 30 days of life. A study carried out at *Unidades Básicas de Saúde* (UBS), (Basic Health Units) in Rio de Janeiro City has shown that women who did not have experience in the breastfeeding process were 57% more likely to introduce fluids in their children's diet.[13]

Mothers who did not breastfeed their previous children tend to follow instructions provided by family members such as children's grandmothers, who advise them to give water and/or tea to their babies in their first month of life, because they believe it is the most appropriate thing to do at this stage.[2,12] These grandmothers had their children between the 1960s and 1980s, when the beneficial properties of breastfeeding were not so well evidenced in the scientific literature yet. Thus, beliefs about "weak milk" prevailed even among pediatricians, and it resulted in the spread of their experiences.[25]

Such a family culture passed on from generation to generation has an even more important impact on primiparous women,[26] who deal with insecurities and uncertainties about the breastfeeding process and about the time to introduce fluids in children's diet.[18]

In the current study, mothers without a partner introduced tea in their newborns' diet more often. These women live with less emotional, social and economic support from a partner, which is often counterbalanced by the support of a family member such as maternal grandmothers.[13]

Artificial milk in the children's first month of life was associated with higher prevalence of tea introduction in children's diet. It is possible to suggest that this association may be linked to likely increased incidence of intestinal colic in children consuming artificial milk in their first thirty days of life, which may have led to increase tea consumption. A cohort study conducted in the South of Brazil has shown that breastfeeding was the main protective factor against colic development.[27]

The aim of this present study was to investigate factors associated with early tea introduction in children's diet in their first month of life. Despite the high prevalence of tea consumption among newborns in the country,[4,6,18,19,28] studies available in the literature about factors exclusively associated with tea consumption remain scarce and are old.[3,12] This fact emphasizes the importance of this current study.

The cross-sectional approach of the current study can be mentioned as a limiting factor, since exposure and outcome are analyzed concurrently, and it makes it difficult to establish the temporal between possible predictors and the dependent variable (temporality bias). However, the interviews were carried out at the children's 30th day of life; thus, the addressed experience are in the near past, which reduced the likelihood of memory and temporality bias. The question about tea was only referred to whether or not it was given to the babies; thus, it was not possible to classify the types of tea and the consumed volume. Since the rural population was not investigated, results can be extrapolated to urban groups who present similar characteristics to these studied population.

Results in the current study point toward the inadequate practice of giving tea to babies in their first 30 days of life, a fact that deserves attention from the health professionals due to the significant impacts tea consumption can have on immature bodies, among those are: dehydration, electrolyte disturbances and toxicity,[29] which are factors capable of increasing the risk of morbidity and

mortality in this population.

In addition, artificial milk was associated with tea consumption in the babies' first month of life, and it can compromise their nutritional status, or unless, in case of duly justified prescription, such a practice is unnecessary and even harmful to children's health.

It is of paramount importance of taking health education actions in prenatal and postpartum consultations mainly focused on women presenting low economic level, low schooling, primiparous women and women who do not have a partner. This population must be instructed about the harm tea can bring to children's health and about the damage caused by this practice in breastfeeding, so they can feel safe

and encouraged to perform exclusive breastfeeding until the sixth month of their babies' lives.

Authors' contribution

Cirqueira RP, Novaes TG and Gomes AT contributed in the analysis, data interpretation and manuscript writing. Bezerra VM, Netto MP and Rocha DS contributed conception, study designed and critical revision of manuscript. All authors approved the final version of the article.

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