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ORIGINAL ARTICLE

Six months of exclusive breastfeeding of very low birth weight preterm babies submitted to the kangaroo method

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Kangaroo-Mother Care Method,
Breast Feeding,
Infant,
Very Low Birth Weight,
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Abstract

Objective: To know the rate and factors associated with exclusive breastfeeding in the follow-up of the preterm submitted to the kangaroo method. **Methods:** Cross-sectional study performed with pre-terms smaller than 33 weeks and/or birth weight <1,500 grams, born in 2019, submitted to the kangaroo method and followed up to six months. Descriptive analysis and association and comparison tests were carried out for the maternal and neonatal factors for the outcome of exclusive breastfeeding yes (G1) and not (G2) by the IBM-SPSS/Statistics program 22. **Results:** Of the 111 patients who were discharged, 82 (100%) were followed up to the corrected ages 3.8/4.2 and chronological 5.9/6.3 months, respectively, in the G1/G2. Exclusive breastfeeding was present in G1 at 22 (26.8%) patients and 60 (73.2%) in the G2 had already introduced formula. Maternal age averages 28/29 years, gestational age 30.3/30.4 weeks, birth weight 1295/1434g, mechanical ventilation time 5.0/5.8 and total hospitalization 56/49 days in groups G1 and G2, respectively. Cesarian section frequencies 68/61%, necrotizing enterocolitis 4.5/8.3%, severe peri-intraventricular hemorrhage 4,5/8.3%, late sepsis 19/16.9%, and rehospitalization after discharge 4.5/6,8% in G1 and G2 patients. There was no statistical significance of the variables analyzed for the outcome of exclusive breastfeeding. **Conclusion:** Compared to other cohorts and at the service itself in 2010 analysis, the breastfeeding rate was high and, especially the exclusive breastfeeding, condition associated with the best development of the preterm. The perinatal variables were not determinants of the success of exclusive breastfeeding in these patients treated by the kangaroo method.

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INTRODUCTION

Exclusive breastfeeding (EBF) is recommended for all newborns (NBs), especially preterm infants (PTNBs), as it offers benefits such as reduced rates of late-onset sepsis (ST), necrotizing enterocolitis (NEC), retinopathy of the prematurity, rehospitalizations in the first year of life and better outcomes in neurological development. Considering the follow-up of these patients in the long term, EBF is associated with lower rates of metabolic syndrome, blood pressure and levels of low-density lipoproteins, in addition to lower insulin and leptin resistance when they reach adolescence, especially when compared to preterm infants receiving formula[1].

In Brazil, approximately 12% of live births are PTNB. The immaturity of the sucking-swallowing-breathing reflex, especially below 34 weeks of age, may result in difficulties for the preterm infant (PT) to receive the best food - the mother's own milk, either by orogastric route, translactation or finger- feeding[2].

The lower prevalence of breastfeeding (BF) in low-birth-weight newborns (LBW) can be, in part, explained by the complexity of neonatal routines, which make it difficult for the mother to remain in the neonatal unit and breastfeeding. In a study conducted in a Neonatal Intensive Care Unit (NICU) in the state of Mato Grosso, the authors concluded that weaning during hospitalization was due not only to neonatal pathologies, but also to the lack of routines and practices to encourage BF and the difficulties related to the hospital environment[3,4].

Despite the widely known benefits of BF and the existence of laws and programs to support this practice, rates are still below the recommended level. Studies show the low prevalence at regional, national and global levels and highlight numerous associated factors. Follow-up and continued surveillance are essential to change this scenario, which can lead to lower infant morbidity and mortality rates[5].

Therefore, the application of the Kangaroo Method (KM) has shown satisfactory results with increased BF rates in NBLB in different analyses. According to a prospective observational study carried out in São Paulo, EBF was 82.6% higher in patients treated by the KM compared to the control group, which received conventional neonatal care. The effect of this model of humanized care, which advocates the presence of the mother with the baby, valuing maternal care and skin-to-skin contact, proved to be crucial for this purpose, proving to be more effective in increasing the prevalence of EBF in the short and medium terms.[6]

Despite this knowledge, breastfeeding rates in PTNB are still not ideal. There are few studies that report the duration of BF after hospital discharge, throughout the first year of life, in newborns younger than 33 weeks. This knowledge is important for promoting BF maintenance strategies in this group of patients[7].

Thus, given the relevance of the subject, the present study aims to understand the rate of EBF in premature infants of less than 33 weeks and/or weighing less than 1500g, that is, very low birth weight (VLBW), at six months of chronological age (CA) and establish the risk factors associated with this outcome.

METHODS

An observational, cross-sectional study was carried out with PTs of less than 33 weeks and/or VLBW (below 1,500 grams), born from January to December 2019, at Januário Cicco Maternity School (MEJC), followed from birth to the six months of CA and who underwent follow-up consultations and at the clinic until September 2020. Patients born at less than 27 weeks, with major congenital malformations or with chromosomal syndromes, from another maternity hospital and transferred to our service for more than seven days.

This study consists of an excerpt from the project "How do former VLBW preterm infants grow after discharge in Brazil? A multicenter cohort study" (figure 1), approved by the Research Ethics Committee, under number (CAE 97359518710015327). The parents/guardians of the participating NBs authorized their children's participation in the study by signing the Informed Consent Form (figure 2) and the anonymity of those included was maintained through identification by numbers. Maternal (maternal age, pre-eclampsia, mode of delivery), neonatal (birth weight, gestational age (GA), birth weight, classification as to GA, gender) and in-hospital (APGAR in the fifth minute, time of mechanical ventilation (MV), respiratory distress syndrome (RDS), TS, NEC, seizures, degree of peri-intraventricular hemorrhage (PIVH), weight at hospital discharge and days of hospital stay) were obtained after parental authorization, by analysis of the physical and electronic records and consultation of the NB discharge summaries, with data referring to the period of hospitalization in the NICU and in the Kangaroo Unit ward. At the six-month consultation, the patients were allocated in G1 if they received exclusive breast milk and in G2 if they had already been started on other foodstuff. Due to the pandemic, with the impossibility of attending the outpatient clinic, remote consultations were carried out to fill in the data referring to the sixth-month visit. For this, it was necessary for the baby to have attended a healthcare service to have the data checked by a qualified professional.

For data analysis, the Shapiro-Wilk test was applied in order to verify the compliance of continuous variables to the normal distribution. As their distribution was normal, the descriptive analysis was performed using the mean and standard deviation (Mean ± SD), and Student's t test for independent samples was applied. For categorical variables, the analysis was performed using absolute and relative frequencies. The Chi-square test was used to investigate the association between categorical variables, and in situations where the cells in the tables had occurrences of less than five, Fisher's exact test was applied. A significance level of 5% was adopted for all analyses. The software used was IBM SPSS Statistics 22.

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2018-0360 Rita de Cássia Silveira – How do Very-Low-Birthweight grow after hospital discharge in Brazil? A multicentric cohort study

MATERNAL INFO

Record ID	----------
Number of Mother's Chart	----------
Mother's Name Initials	---------- (e.g., Maria de Jesus da Silva – type MJS, do not type a dot in between the letters)
What is the mother's date of birth?	---------- (use the calendar to insert the date)
Did the mother have preeclampsia?	----- Yes ----- No
Did the mother use steroids?	----- Yes ----- No
How many hours ago did the water break?	_____ (type the number only. E.g., if it broke 4 hours ago, type 4. If it broke now, type 0 (zero); if it broke 4 hours and 30 minutes ago, type 4.5).
Number of the NB's chart	----------
NB's initials	---------- (e.g. Carlos de Alcantara e Silva, type CAS. Do not type dots in between the letters).
What is the NB's birth date?	---------- (use the calendar to insert the date)
Why was the NB premature?	___ Twin ___ TPP ___ Ovular infection ___ DM ___ Other ___ Not applicable

Exclusion Criteria

Did the NB have larger congenital malformations?	___ Yes ___ No
Did the NB have a genetic syndrome?	___ Yes ___ No
Did the NB die during the neonatal hospital stay?	___ Yes ___ No

Was the newborn transferred from another center after 7 days of life?	___ Yes ___ No (if up to 7 days, include in the study. With 8 days or more, do not include).

NB Info	
General instructions **Whenever there are numbers with decimals in the answers, please type a dot instead of a comma. E.g., 53,4, type 53.4** **Code for missing info: 9999**	
What is the NB's weight in grams?	_____ (type the number only. E.g., 1kg and 250 grams. Type 1250).
What is the NB's length at birth in cm?	_____ (type the number only. E.g., 36cm. type 36. E.g.,2: 38 cm and one half, type 38.5)
What is the NB's head circumference (cm)?	_____ (type the number only. E.g.,28cm, type 28. If it is 28 and one half, type 28.5)
What is the NB's brachial circumference (cm) ?	_____ (type the number only. E.g.,28cm, type 28. If it is 28 and one half, type 28.5)
What is the gestational age in weeks?	_____ (type the number only. E.g.,29 weeks, type 29. The days will be entered in the next questions)
If there were days in the previous question, please enter it in this field. If there were no days, please enter zero	_____
What is the NB's classification vis-à-vis gestational age?	_____ AGA _____ SGA
What is the NB's sex	_____ Male _____ Female
What is the type of delivery?	_____ Vaginal _____ C-section
What is the first-minute Apgar?	_____ (enter the number only)
What is the fifth-minute Apgar?	_____ (enter the number only)
Was there a need for mechanical ventilation?	_____ Yes _____ No
How many days of mechanical ventilation ?	_____ (enter the number only. If none, please enter 0 (zero))
Did the NB use nasal PAP	_____ Yes _____ No

How many days of nasal PAP	_____ (e.g., if NB used for two-and-half days, type 2.5. If not used, please enter 0 (zero)).
Did the NB use oxygen ?	----- Yes ----- No
How many days in oxygen?	_____ (enter the number only, if not used, type 0 (zero))
Did the NB use total parenteral nutrition with amino acids in the first 24 hours of life?	---- Yes ---- No
Did the NB use total parenteral nutrition with lipids in the first 24 hours of life?	---- Yes ---- No
What was the parenteral nutrition duration?	_____ (enter the number only, if not used, type 0 (zero))
When did the enteral nutrition start?	_____ (use the calendar to insert the date)
When did the NB reach full enteral nutrition?	_____ (use the calendar to insert the date)
Did the NB have hyalin membrane disease?	--- Yes --- No
Did the NB have early sepsis (< 72 hours of life, with positive blood culture)?	--- Yes --- No
Did the NB have necrotizing enterocolitis?	--- Yes --- No
Did the NB have neonatal seizures?	--- Yes --- No
Did the NB have peri-intraventricular hemorrhage (what level)?	--- Yes --- No
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What was the hemorrhage level?	--- Not happened --- Level 1 --- Level 2 --- Level 3 --- Level 4 (if the NB did not have hemorrhage, select "Not Happened).
Did the NB have peri-intraventricular leukomalacia?	--- Yes --- No
Did the NB have prematurity retinopathy? (level)	--- Yes --- No
What was the retinopathy stage?	--- Not happened --- stage 1 --- stage 2 --- stage 3 --- stage 4 --- stage 5

	(if the NB did not have retinopathy, select "Not happened")
Did the NB have surgical correction of the retinopathy?	--- Yes --- No
What was the NB's weight in grams upon discharge?	_____ (enter the number only, e.g., 1kg and 250 grams, enter 1250)
What was the NB's length upon discharge in cm?	_____ (enter the number only, e.g., 53cm; type 53. E.g., 55,4, enter 55.4)
What is the NB's brachial circumference upon discharge (cm) ?	_____ (type the number only. E.g.,28cm, type 28. If it is 28 and one half, type 28.5)
What is the NB's head circumference upon discharge (cm)?	_____ (type the number only. E.g.,28cm, type 28. If it is 29 and one half, type 29.5)
What is the NB's hospital discharge date?	_____ (use the calendar to insert the date)
First Visit – Discharge Info	Page 6 of 9
Consultation date	_____ (use the calendar to insert the date)
What is the chronological age in months? If there are days, it will be entered in the next question	_____ (enter only the number of months. E.g., 1 month and 3 days, enter 1 and in the next question enter 3)
If there were days in the previous question, enter de number of days	_____ (enter the number only. If there were none, enter zero).
What is the corrected age in weeks? If there were days, enter the number of days in the next question	_____
If there were days in the corrected age, enter the number of days	---------- (If there were none, enter zero).
What was the NB's weight in grams on the day of the office visit?	_____ (enter the number only. E.g., 1kg and 250 grams, enter 1250)
What was the NB's length in cm on the day of the office visit?	_____ (enter the number only, e.g., 53cm; enter 53. E.g., 55,4, enter 55.4)
What was the brachial circumference in cm on the day of the office visit?	_____ (enter the number only. E.g., 28cm. enter 28. E.g., 29,6, enter 29.6).
What was the head circumference in cm on the day of the office visit?	_____ (enter the number only. E.g., 28cm. enter 28. E.g., 26,7, enter 26.7).
Was the NB admitted to the hospital during this period?	--- Yes --- No
Did the child die?	--- Yes --- No
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What was the NB's feeding?	___ Maternal milk ___ Maternal milk + formula ___ Maternal milk + fruits ___ Maternal milk + formula + fruits ___ Formula + fruits ___ Maternal milk + soups ___ Maternal milk + formula + soups ___ Formula + soups
What was the breastfeeding duration in minutes?	_____ (enter the number only. E.g., 1 hour: enter 60; if not used, enter 0 (zero)).
What was the number of bottles per day?	_____ (enter the number only. If not used, enter 0 (zero)).
What was the volume of each bottle in ml?	_____ (enter the number only. E.g., 30ml: enter 30; if not used, enter 0 (zero)).
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Office Visit	
Visit Date	(Use the Calendar to enter the date)
What is the chronological date in months? If there are days, they will be entered in the next question.	_____ (enter the number of months only. E.g., 1 month and 3 days, enter 1; and I the next question, enter 3)
If there were days in the previous question, enter the number of days here.	_____ (Enter the number only, if there are none, enter zero).
What is the corrected age in months? If there are days, enter them in the next question.	_____
If there are days in the corrected age, enter them here.	_____ (if there are none, enter zero)
What is the NB's weight in grams on the visit day?	_____ (Enter the number only. E.g., 1kg and 250 grams, enter 1250).
What is the NB's length on the visit day?	_____ (Enter the number only. E.g., 53 cm, enter 53. E.g., 55,4, enter 55.4).
What is the NB's brachial circumference on the visit day?	_____ (Enter the number only. E.g., 28 cm, enter 28. E.g., 29,6 enter 29.6).
What is the NB's Head circumference on the visit day?	_____ (Enter the number only. E.g., 28 cm, enter 28. E.g., 26,7 enter 26.7).
Was the NB admitted during the period?	___ Yes ___ No
Did the child die?	___ Yes ___ No
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What was the NB's feeding?	___ Maternal milk ___ Maternal milk + formula ___ Maternal milk + fruits ___ Maternal milk + formula + fruits ___ Formula + fruits ___ Maternal milk + soups ___ Maternal milk + formula + soups

	___ Formula + soups
What was the breastfeeding duration in minutes?	_____ (enter the number only. E.g., 1 hour: enter 60; if not used, enter 0 (zero)).
What was the number of bottles per day?	_____ (enter the number only. If not used, enter 0 (zero)).
What was the volume of each bottle in ml?	_____ (enter the number only. E.g., 30ml: enter 30; if not used, enter 0 (zero)).

Figure 1. Protocols from the ABRACE Multicentric study.

Informed consent form

Project GPPG or CAAE 97355918.7.1001.5327

Project title: How very low birth weight preterm infants grow after hospital discharge in Brazil: a multicenter cohort study.

This study is being coordinated by the neonatology service of Hospital de Clínicas de Porto Alegre (HCPA) and is being carried out in other 21 hospitals in Brazil.

The baby you are responsible for is being invited to participate in a survey on the growth of very low birth weight premature babies after hospital discharge. Prematurity (birth before the right time, scheduled for 9 months) can be a serious situation, which requires very careful monitoring by the pediatrician after the baby is discharged. It is important to evaluate weight, length and head circumference (head size) in all consultations, in addition to the child's development.

The accompanying graphs of the children's weight gain (like the one on the vaccination card) were made with information from children who were born at term (at the right time).

In this study, we want to assess weight gain, length and head growth in very low birth weight premature babies (who were born with a weight equal to or less than 1,500 grams).

If you accept that the baby for whom you are responsible participates in the study, we ask for your authorization to use the data concerning the baby's weight, length and head circumference, which are measured in all consultations at the clinic. No other procedure will be performed besides the outpatient routine. If you do not agree to participate in the study, the baby will continue to be treated at the outpatient clinic in the same way.

Participation in the study will probably not bring direct benefits to the participants, but it will contribute to the study of the growth of very low birth weight preterm infants and may benefit future patients.

Participation in this study is completely voluntary, that is, it is not mandatory. If you decide not to authorize the collection of data for the study, or if you still wish to withdraw your consent after starting the study, there will be no loss to the care that the baby receives or may receive at the institution.

No type of payment is foreseen for participating in the study and you will not incur any costs with respect to the procedures involved.

The data collected during the study will always be treated confidentially. The results will be presented jointly, without identifying the participants, that is, the names of the participants will not appear in the publication of the results.

If you have any questions, you can contact the head researcher, Prof. Dr. Rita de Cassia dos Santos Silveira, by phone: 33598794, or the Research Ethics Committee of the Hospital de Clínicas de Porto Alegre (HCPA), by phone (51) 33597640, or on the 2nd floor of the HCPA, room 2229, Monday to Friday, from 8 am to 5 pm.

This Term is signed in two copies, one for the participant and another for the researchers.

_____

Study Participant's Name

_____

Signature

_____

Name of the researcher who applied the Term

Figura 2. Termo de Consentimento Livre e Esclarecido.

RESULTS

During the study period, 140 PT were admitted to the NICU. The flowchart of patients from admission to the NICU until the six-month joint stay is described in Figure 3.

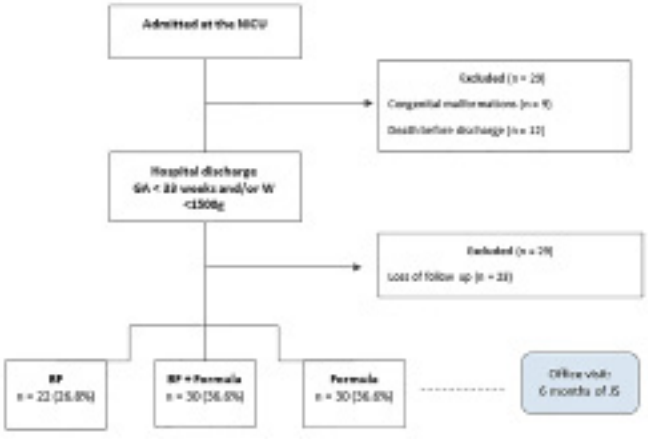


Figure 3. Flowchart of included patients. JS =Joint Stay.

The series was characterized by 33 (40.2%) males PT, the mean GA was 30.4 (+1.8) weeks and birth weight 1404g (+362.4) and nine (11.2 %) were small for GA.

Table 1 shows the analysis of maternal and neonatal factors for the BF outcome of 82 NBVLW PTs at the six-month JS consultation.

Table 2 describes the analysis of in-hospital neonatal variables for the BF outcome in the outpatient follow-up of 82 PT NBVLW with six months of JS.

Table 3 shows the analysis of the variables of the six-month JS consultation for the BF outcome of the 82 NBVLW patients followed up at the MEJC risk NB follow-up clinic.

DISCUSSION

EBF at six months of life is a difficult goal to be achieved, especially in PTs, due to physiological immaturity due to the absence or incoordination of the sucking-swallowing-breathing reflex, neonatal factors and associated disorders[2]. In 2010, in the first week after coming to the MEJC, which applies the KM, the EBF rate was only 25% among the NBVLW[8]. After 10 years,

Table 1. Maternal and neonatal factors.

Variables	EBF		*p-value*[a]
	Yes	No	
	22 (26.8)	60 (73.2)	
Maternal age, years	28±7.4	29±7.9	0.665
Maternal age, n (%)			0.309
≥ 30 years	8 (38.1)	32 (54.2)	
< 30 years	13 (61.9)	27 (45.8)	
Maternal pre-eclampsia, n (%)			0.293
Yes	10 (45.5)	18 (30.0)	
No	12 (54.5)	42 (70.0)	
Type of delivery, n (%)			0.613
Vaginal	7 (31.8)	23 (39.0)	
C-Section	15 (68.2)	36 (61.0)	
Birthweight, g.	1.295±292	1.434±366	0.112
Gestational Age, weeks.	30.3±1.83	30.4±1.76	0.747
Classification as to GA, n (%)			0.700*
PGA	19 (86.4)	52 (89.6)	
SGA	3 (13.6)	6 (10.4)	
NB gender, n (%)			0.801
Males	8 (36.4)	25 (41.7)	
Females	14 (63.6)	35 (58.3)	

[a]Significance of difference between groups by Student's t-test (continuous variables) or Pearson's or Fisher's chi-square test (categorical variables). Continuous data are expressed as mean (ME) and standard deviation (SD): ME ± SD Categorical data are expressed as absolute (n) and relative (%) frequency. Abbreviations: n, number; MV, Mechanical Ventilation; CPAP, Continuous Positive Airway Pressure.

a new study, at the same institution, shows much higher rates in the outpatient follow-up, with a similar rate of EBF, 26.8%, but after six months of JS.

A study with a similar population, 258 NBVLW, born at the Fernandes Figueira Institute of Women's, Children's and Adolescents' Health Maternity (Rio de Janeiro), observed only 5.5% EBF upon hospital discharge. At four months of CGA, 48.1% were still receiving breast milk; however associated with formula and no EBF rate was described[7]. Considering the importance of exclusive breastfeeding for the growth and development of these patients, the satisfactory results achieved in 2020 stand out, with 26.8% of EBF, 36.6% of BF associated with formula, totaling 63.4% of BF in the follow-up of the MEJC PTs. In Sweden, the follow-up of preterm infants up to 12 months described a similar rate of 23% of EBF at six months of JS; however, the casuistry covered GA below 37 weeks. In the same year, 2018, a multicenter European cohort with 3217 PTs under 32 weeks had 34.45% of them breastfed at six months of life, reiterating the satisfactory results of this cohort, which had a mean GA of 30.4 weeks and similar rates of breastfeeding[9,10].

The assessment of the prevalence of BF in a Brazilian cohort of PTNBs, from a Kangaroo Ward, showed that 94.9% of them were discharged on BF, 56.2% being exclusive, and that at six months of age 40.7% were in BF, being 14.4% exclusive[11]. Even when using the KM, such results in 2014 were lower than those seen at the MEJC in 2020. The six-year gap between the two analyzes may partially explain the evolution of EBF rates, similarly to what happened in the KM itself at MEJC between 2010 and 2020. Considering that in recent years there have been improvements in clinical practices in most maternity hospitals in the country, in addition to the increase in multidisciplinary teams, with the inclusion of speech therapists and nutritionists in most services, conditions that have not been evaluated at the moment, we can assume that the temporal difference could justify the results, with much higher rates of EBF in 2020.

In fact, preliminary results from the Ministry of Health's National Study of Child Food and Nutrition[12] show that BF rates are increasing in Brazil. In this study, 14,505 children under five years of age were evaluated between 2019 and 2020, and more than half (53%) of children born at term in Brazil continue to be breastfed in the first year of life. Among children younger than six months, the EBF rate is 45.7%. Thus, making a comparison with the results obtained for PTNB in the present analysis, which rate was 26.8%, it is inferred that, despite the increase in relation to the 2010 study in the same service, the rates are still lower than the general population . This is probably due to the risk factors to which this population is subjected, and it is important to carry out studies that seek to identify the determinants associated with still unsatisfactory results and establish interventions in the intra- and extra-hospital care of these patients.

Table 2. Intra-hospital neonatal variables.

Variables		EBF		*p*-value[a]
	n	Yes	No	
n, %		22 (26.8)	60 (73.2)	
5th minute APAGAR, n (%)	82			0.740
< 7 points		4 (18.2)	9 (15)	
≥ 7 points		18 (81.8)	51 (85.0)	
MV use, days	82	5 ± 6.4	5.8 ± 11.2	0.743
CPAP use, days	82	5.7 ± 7	5 ± 5.3	0.669
SDR, n (%)	82			0.590
Yes		5 (22.7)	18 (30.0)	
No		17 (77.3)	42 (70.0)	
Late sepsis (> 72h), n (%)	80			1.000
Yes		4 (19.0)	10 (16.9)	
No		17 (81.0)	49 (83.1)	
Necrosing Enterocolitis, n (%)	82			0.678
Yes		1 (4.5)	5 (8.3)	
No		21 (95.5)	55 (91.7)	
Neonatal seizures, n (%)	82			0.560
Yes		0 (0.0)	3 (5.0)	
No		22 (100.0)	57 (95.0)	
Degree of perivetricular hemorrhage, n (%)	82			0.678
None (Grades 1 or 2)		21 (95.5)	55 (91.7)	
Grade 3 or 4		1 (4.5)	5 (8.3)	
Weight upon discharge		2131±420	2064±311.5	0.433
Chronological age upon discharge, DIH		56±27	49±24.5	0.318

[a]Significance of difference between groups by Student's t-test (continuous variables) or Pearson's or Fisher's chi-square test (categorical variables). Continuous data are expressed as mean (ME) and standard deviation (SD): ME ± SD Categorical data are expressed as absolute (n) and relative (%) frequency. Abbreviations: n, number; MV, Mechanical Ventilation; CPAP, Continuous Positive Airway Pressure.

Table 3. Variables from the six-month JS visit.

Variables	BF		*p* value[a]
	Yes	No	
N, %	22 (26.8)	60 (73,2)	
Chronological age, months	5.9±0.8	6.3±1.2	0.148
Corrected age, months	3.8±0.7	4.2±1.2	0.145
Weight on the visit, g.	5.935±744	6.305±1151	0.177
Hospital admission during the period, n (%)			1.000
Yes	1 (4.5)	4 (6.8)	
No	21 (95.5)	55 (93.2)	

[a]Significance of difference between groups by Student's *t*-test (continuous variables) or Pearson's or Fisher's chi-square test (categorical variables). Values in bold indicate significance. Continuous data are expressed as mean (ME) and standard deviation (SD): ME ± SD. Categorical data are expressed in absolute (n) and relative (%) frequency. Abbreviations: g, grams; n, number.

In this context, a systematic review concluded that effective support for the increase in the BF rate includes help from a trained team during the postnatal period[13]. On the other hand, a randomized clinical trial carried out in Sweden did not observe a significant difference between the control group and the group of mothers and babies who received conventional support and intervention with daily phone calls in order to offer support, from NICU discharge to 12 months of FH[9].

Studies persists in the search for the identification of factors associated with the improvement in BF rates in PTNB. A study carried out in Ethiopia in 2016, after logistic regression analysis, showed that mothers ≥ 30 years old practiced more EBF. The reason could be that as maternal age increases, child management experiences also increase[14]. In this follow-up, however, the averages did not differ in the two groups analyzed, and were below 30 years.

As for the mode of delivery, there is evidence in the literature that women undergoing repeated cesarean sections have greater difficulty in initiating breastfeeding, since there is less maternal-infant contact, use of medication and, often, post-surgical pain. Furthermore, this mode of delivery is associated with a lower volume of milk produced on the fourth day after birth, translating into greater difficulty in breastfeeding[15]. In the present study, however, high rates of cesarean delivery were seen in both groups, with no difference for EBF maintenance, as well as a study carried out in Sweden that also found no difference for this variable in relation to EBF in PTs at six and 12 months of JS[9]. A meta-analysis similarly demonstrated that only elective cesarean sections would be associated with BF failure[16].

Other maternal variables, such as low socioeconomic status, education and home support, showed an important relationship with the EBF outcome, according to two studies carried out in Sweden, one in 2007 and another in 2018[9,10]. These variables were not analyzed in this study, and it is important to carry out future studies to understand this reality of the clinic.

Regarding GA, a study carried out by one of the largest maternal and child health centers in China, which offers classes on breastfeeding and education for parents, showed that babies with less than 32 weeks of GA were less likely to receive EBF than six months, and those under 28 weeks had more difficulty maintaining breastfeeding[15]. Furthermore, evidence presented by a study in Australia (2002) showed that, in mothers whose delivery was premature, there was a delay in the onset of lactogenesis and 82% have impairment in the onset of lactation. EBF maintenance was much more difficult in this population, with less than 10% of children on EBF both at discharge and after one month of JS[17]. Despite these results in the literature, in the present study, there was no association between GA and EBF rates at four months of JS, in the six-month chronological consultation, despite the immaturity observed in both groups, whose averages were 30.3 and 30.4 weeks in those with and without EBF, respectively.

Neonatal morbidity could also be a determining factor in the duration of breastfeeding[18], but the in-hospital neonatal variables analyzed did not show, an association with the EBF outcome. Previous studies also reported that few neonatal morbidities influence the continuation of BF, according to an Israeli cohort with 181 preterm infants < 32 weeks, which showed that bronchopulmonary dysplasia, NEC, IVH, leukomalacia, sepsis, retinopathy of prematurity and use of MV did not affect the duration of BF to six months JS, whose rate was 19.9%[19]. Although the statistical analysis did not show an association between morbidities and EBF, it was reported that most of the affected patients belonged to the group that did not prolong EBF, as in NEC (83.3%), in PIVH (83.3 %), in ST (71.4%) and in SDR (78.3%).

A prospective cohort, carried out in Goiás, reported a mean time on MV of 4.9 days and an association of this condition with a higher risk of interruption of BF, in preterm infants < 37 weeks[3]. In the present study, despite the lower GA and prolonged ventilation time, there was no difference in this variable for the prevalence of EB at six months[20].

A multicenter study carried out in 2018 in Sweden, with methodology similar to the KM, pointed out that the longer the period of stay in the NICU, the greater the chance of weaning in the first 12 months of life[9]. In Pará, in 2017, analyzing the profile of NBVLW admitted to the NICU with difficulty in maintaining breastfeeding, a risk was found in length of stay of more than 52.5 days[21]. In the current analysis, the length of hospital stay was on average 56 and 49 days for infants on EBF yes and no, respectively, at six months. In 2010, at the same institution, the average length of stay was 47.6 days for PTNBs who were not on EBF seven days after discharge[8], which is the main determinant of weaning. These results show that the length of stay is no longer a factor associated with weaning in 2020, despite being long. This can possibly be explained by up-to-date clinical practices and the presence of a multidisciplinary team at the service, which had several professionals added and prepared to encourage BF in the application of the KM in recent years.

A study carried out in Londrina, reported more frequent weaning in babies who need re-hospitalization in the first six months of life. In addition, the analysis showed a 61% lower risk of new hospitalizations in breastfed patients, concluding that BF has a protective character for readmissions in the first year of life of babies[22]. Even though there is no association of this factor in this analysis, only 4.5% of the EBF group required hospital readmission, a lower rate than that observed in the non EBF group, which was 6.8%.

Nutritional support for NBLBW with exclusive breast milk after discharge and in the long term remains a challenge for the multidisciplinary team, which must be continuously attentive to the risk factors that compromise this practice.

In this study, the vulnerable population submitted to the KM had a successful EBF rate, when compared to the numbers of the last ten years of this institution and other centers. The length of hospital stay and the other in-hospital factors analyzed, which were previously associated with weaning, did not appear as predictors of this outcome.

These results suggest that the constant training of multidisciplinary teams, which are increasingly completer and better prepared to deal with PT, associated with the modernization of clinical practices, may be reflecting on these results. Studies analyzing new variables will be important in order to expand knowledge about all the determinants that may reflect better EBF rates in PT in outpatient follow-up.

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