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ORIGINAL

Influence of Kangaroo Mother Care on breastfeeding, the introduction of complementary feeding and diet quality in the first year of life

Influência do Método Canguru sobre o aleitamento materno, a introdução da alimentação complementar e a qualidade da dieta, no primeiro ano de vida

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ABSTRACT

Objective

To assess the influence of Kangaroo Mother Care on breastfeeding rates in preterm neonates, both at hospital discharge and throughout the first year of life, as well as its relation with the time of introduction of early complementary feeding and diet quality.

Methods

Observational, prospective and analytical longitudinal study conducted in a public hospital in southern Brazil. The study included 46 preterm neonates, who were admitted to a Kangaroo Neonatal Intermediate Care Unit or Conventional Neonatal Intermediate Care Unit.

Results

The frequency of exclusive breastfeeding at hospital discharge was higher in preterm neonates of Kangaroo Neonatal Intermediate Care Unit (p<0.001), and at four months of corrected age, 35% of them continued on exclusive

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breastfeeding (p=0.029), as compared to infants in Conventional Neonatal Intermediate Care Unit. However, at six and 12 months, no difference was found in breastfeeding rates between the participating groups. At four months of corrected age, approximately 45% of the breastfeeding infants in both groups were already on complementary feeding. At 12 months of corrected age, consumption of ultra-processed foods was 38.9% in infants from the Kangaroo Neonatal Intermediate Care Unit and 70% in infants from the Conventional Neonatal Intermediate Care Unit (p=0.054), and no significant differences were found.

Conclusion

The Kangaroo Mother Care fostered exclusive breastfeeding at hospital discharge and at 4 months of corrected age. On the other hand, with regard to the early introduction of complementary feeding, Kangaroo Mother Care was not protective, and a high rate of consumption of processed foods by infants was found.

Keywords: Eating behavior. Kangaroo mother care. Neonatal intensive care. Newborn. Premature.

RESUMO

Objetivo

Verificar a influência do Método Canguru sobre as taxas de aleitamento materno em recém-nascidos pré-termo, tanto na alta hospitalar, como ao longo do primeiro ano de vida, assim como sua relação com o momento de introdução da alimentação complementar e a qualidade da dieta.

Métodos

Estudo longitudinal do tipo observacional, prospectivo e analítico em um hospital público no Sul do Brasil. Participaram do estudo 46 recém-nascidos pré-termo, que foram internados em Unidade de Cuidado Intermediário Neonatal Canguru ou Unidade de Cuidado Intermediário Neonatal Convencional.

Resultados

A frequência de aleitamento materno exclusivo na alta hospitalar foi mais elevada nos recém-nascidos pré-termo da Unidade de Cuidado Intermediário Neonatal Canguru (p<0,001), sendo certo que, aos quatro meses de idade corrigida, 35% deles continuavam em aleitamento materno exclusivo (p=0,029), em comparação com os bebês da Unidade de Cuidado Intermediário Neonatal Convencional. Já aos seis e 12 meses, não foram encontradas diferenças nas taxas de aleitamento materno entre os grupos participantes. Aos quatro meses de idade corrigida, aproximadamente 45% dos lactentes de ambos os grupos já haviam iniciado a alimentação complementar. Aos 12 meses de idade corrigida, o consumo de alimentos ultraprocessados foi de 38,9% nos lactentes da Unidade de Cuidado Intermediário Neonatal Canguru e de 70% nos da Unidade de Cuidado Intermediário Neonatal Convencional (p=0,054), não sendo encontradas diferenças significativas.

Conclusão

O Método Canguru favoreceu o aleitamento materno exclusivo na alta hospitalar e aos quatro meses de idade corrigida. Já para a introdução precoce da alimentação complementar, o Método Canguru não se mostrou protetor, sendo encontrado um elevado percentual de consumo de alimentos processados pelos lactentes.

Palavras-chave: *Comportamento alimentar. Método canguru. Terapia intensiva neonatal. Recém-nascido. Recém-nascido prematuro.*

INTRODUCTION

The World Health Organization (WHO) recommends that all Newborns (NB) be exclusively breastfed until the sixth month of life [1,2]. Breast milk is the food perfectly adapted and personalized for each newborn. It contains adequate amounts of nutrients, bioactive compounds and immunological factors that provide complete nutrition for the child growth and development, being offered at a time when genes are being expressed for life [3,4].

Despite Breastfeeding (BF) benefits' awareness, its use in Preterm Newborns (PTNB) is lower than in full-term NB [5,6]. A study carried out in the central region of Brazil showed a drop in the rate of Exclusive

Breastfeeding (EBF) in PTNB around the second week after hospital discharge, evidencing the difficulties in maintaining EBF in the home setting [7].

Interventions such as Kangaroo Mother Care (KMC) are recommended by the WHO to assist in the health of PTNB, as a routine care for those infants whose weight is equal to or below 2000 grams [8]. The KMC was originally developed by Rey and Martinez [9] in 1979, in the city of Bogotá, and since then it has been recommended worldwide. The main features of KMC are skin-to-skin contact between the NB and the mother and/or caregiver, and when possible, EBF, as well as early hospital discharge with home care [10,11]. The KMC should be started as early as possible, as soon as the PTNB reaches clinical stability, because, in addition to helping with thermal regulation, the method presents positive results in the rates of BF and in the establishment of mother and baby bond [8,12].

Kangaroo Mother Care is considered a BF facilitator [8,10, 12-14]. According to a meta-analysis study carried out in 2016, it was found that KMC increased the probability of EBF by 50% at hospital discharge or with 40 to 41 weeks of corrected gestational age [13]. A study carried out in China found that PTNB who had been under KMC were twice as likely to be in EBF at discharge (OR=2.15), and to continue EBF in the 42-day follow-up after hospital discharge (OR=2.55), when compared to those infants who had not been treated with this method [14]. In a review published by Cochrane, PTNB mothers who practiced the KMC were more likely to breastfeed, both at discharge and in the first three months of follow-up; however in the 6 to 12 months follow up, the investigators found no influence of the method on breastfeeding rates [10].

From six months of life onwards, breastfed milk should be maintained and new foods should be offered, with a variety of colors, flavors and textures. The Food Guide for Brazilian children under two years of age provides recommendations and information about breastfeeding and children feeding [15]. However, for PTNB other aspects should be considered. In addition to gestational age, physiological maturity, infants' abilities to receive foods other than breast milk must be taken into account, a practice that may or may not be used at around six months of Corrected Age (CA) [16].

Considering the importance of breastfeeding for the health of the NB, the present study aimed to verify the influence of KMC on the rates of BF in PTNB, both at hospital discharge and throughout the first year of life. The objective was also to verify the relationship between KMC and the age of introduction of complementary feeding as well as the diet quality at six and 12 months corrected age.

METHODS

This is a longitudinal, observational, prospective and analytical study developed in the Neonatal Intensive Care Unit of a public hospital in the city of *Santa Maria* (RS) Brazil. This unit has 25 beds, ten of which are for high risk, ten for conventional intermediate care and five for the Kangaroo Mother Care. The inclusion of PTNB in the study took place from April 2018 to January 2019. The study was approved by the Ethics Committee of the *Santa Maria* Federal University under opinion nº 183.559, CAAE 11155312.7.0000.5346. All those responsible for the participants signed the Free and Informed Consent Form.

For sample selection, the records of the preterm newborns who met the established inclusion criteria were pre-selected. The inclusion criteria were: gestational age at birth less than or equal to 34 weeks and clinical stability to allow oral feeding. Exclusion criteria considered: presence of head and neck malformations, cardiac and/or genetic syndromes; maternal or neonatal conditions that contraindicated breastfeeding, such as galactosemia; diagnosis of grade III and IV intracranial hemorrhage; bilirubin encephalopathy; bronchopulmonary dysplasia and twin pregnancy.

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The selected PTNB were evaluated based on the oral feeding initiation medical prescription. Guardians answered a structured questionnaire that addressed the gestational and maternal period. In addition, clinical data were collected from the electronic medical records, such as: type of delivery, weight and gestational age at birth, gender, and Apgar scale at the first and fifth minutes. To estimate the adequacy of birth weight for gestational age, the INTERGROWTH-21st Project fetal growth curve was used [17,18].

After hospital discharge, the PTNB were followed up until they were one year old. Data collection on breastfeeding and food introduction was carried out through telephone calls to the infant's mother or guardian, in the week in which the infant completed four, six and 12 months of corrected age.

Upon being discharged from the High Risk Unit, PTNB were transferred to the Kangaroo Neonatal Intermediate Care Unit (UCINCa) or to the Conventional Neonatal Intermediate Care Unit (UCINCo). The allocation to the units was made based on the criteria established by the neonatal ICU. In order to be included in the UCINCa, the PTNB should have their mothers available to remain 24 hours a day in the unit and be able to give the care required by the unit protocol. If these conditions were not available, the PTNB were allocated to the UCINCo group.

The main outcome assessed was breastfeeding at hospital discharge and at four, six and 12 months of corrected age. The EBF was considered nursing the infant without any other food or drink, not even water; from six months of age onwards, nursing included breast milk complemented or not with other types of milk and/or infant formulas [19]. The consumption that occurred the day before the interview was taken into account.

The secondary outcome investigated was the introduction of complementary feeding at four months of corrected age, that is, whether the infant had already received any food or liquid other than breast milk and/or infant formulas at that age. At six and 12 months of corrected age, adequate meals supply frequency was assessed (at six months, having consumed two fruits and one salty food, and at 12 months, having consumed two fruits and two salty foods), minimal dietary diversity (consumption of six food groups: milk, porridge with milk or yogurt; fruits, legumes and greens; vegetables or fruits of orange color and dark green leaves vegetables; meat and eggs; cereals and tubers), consumption of foods rich in iron, in vitamin A and ultra-processed foods according to the *Sistema de Vigilância Alimentar e Nutricional* (Food and Nutrition Surveillance System) [20].

The results obtained were tabulated and reviewed using Stata software (version 10). Data normality was tested using the Shapiro-Wilk test. Continuous variables, with normal distribution, were expressed as mean and standard deviation and the others as median and interquartile range. To compare the means, the Student's *t* test was used, for two independent samples; for the medians, the nonparametric Mann-Whitney U test was used. Categorical variables were compared using the Pearson's Chi-square test. A value of $p<0.05$ was considered significant.

RESULTS

During the study period, 258 PTNB were admitted to the neonatal ICU, of which 94 were considered eligible for the study because they had a gestational age at birth less than or equal to 34 weeks. Out of these, 46 PTNB were selected who met the eligibility criteria previously defined, with 20 from UCINCa and 26 from UCINCo.

The flowchart of the study sample composition can be seen in Figure 1. Sample losses were monitored during the 12-month follow-up. In relation to the initial sample, in the UCINCa group there was a 10% loss of subjects, while in the UCINCo group the loss was 23% at the end of the first year of life.

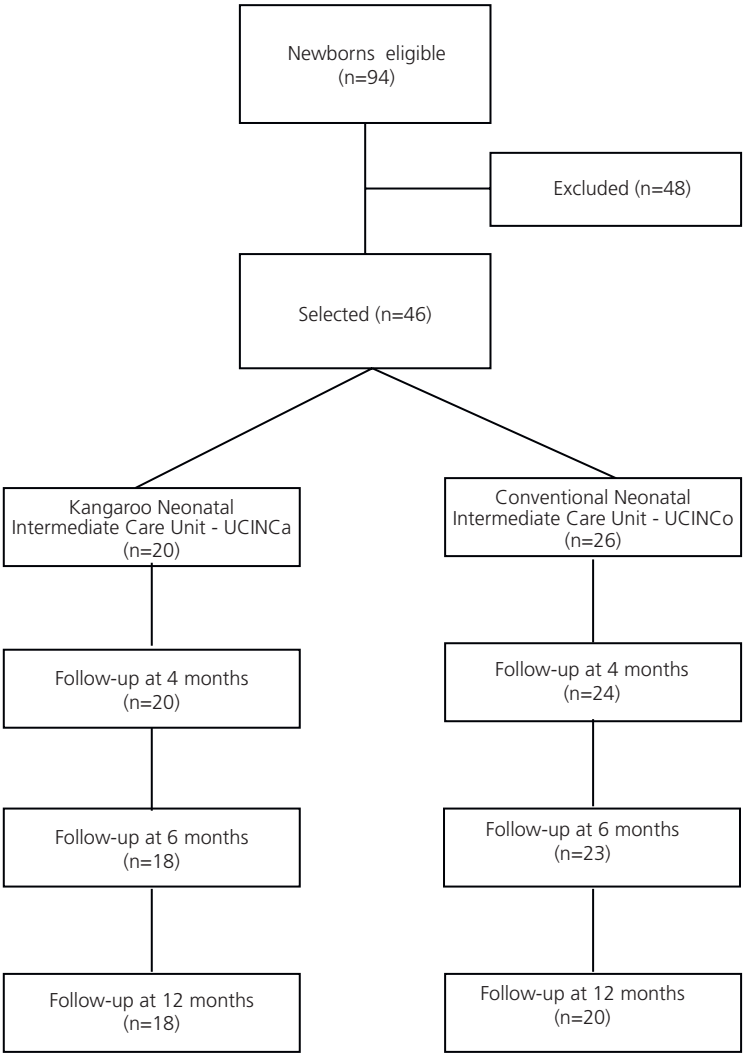

Figure 1 – Flowchart referring to the composition of the study sample. *Santa Maria* (RS), Brazil, 2019-2020.

The PTNB maternal characteristics and birth conditions are described in Table 1. There was no difference in the maternal variables assessed, based on the inpatient unit. It is noteworthy that the conditions of having worked during pregnancy, being a primiparous, having a partner and cesarean delivery were more frequent in UCINCa mothers, while vaginal delivery and previous abortions occurred more frequently in UCINCo mothers. In addition, there were no significant differences regarding weight and gestational age at birth, Apgar scale in the first and fifth minutes of life and adequacy of intrauterine growth, in the PTNB of the units assessed.

Exclusive breastfeeding frequency at hospital discharge and at four months of corrected age is reported in Table 2. The frequency of EBF at discharge from the neonatal unit was almost three times higher for NBs from UCINCa when compared to those from UCINCo (p<0.001). Out of the infants who were on EBF at four months of corrected age, 35% were from UCINCa, and 8.3% from UCINCo, and this difference was statistically significant (p=0.029).

The frequency of complementary feeding introduction at four months and of breastfeeding at six and 12 months corrected age are described in Table 3. The introduction of complementary feeding was

assessed at four months of corrected age. It was found that approximately 45% of PTNB were already on complementary feeding. No statistically significant difference was found between the inpatient units regarding the time of complementary feeding initiation in the neonatal period. At six months of corrected age, breastfeeding frequency was 50% in children from UCINCa and 34.8% in those from UCINCo. At 12 months of corrected age, the percentage of infants still on breastfeeding remained higher in the UCINCa infants (38.9%) when compared to those of UCINCo (30%); however, no statistically significant differences were observed between the groups.

Table 1 – Maternal variables and characteristics of preterm newborns, according to the inpatient unit. *Santa Maria* (RS), Brazil, 2019-2020.

Variables	UCINCa[a]			UCINCo[b]			*p*
	n	%	Mean±SD	n	%	Mean±SD	
Maternal							
Maternal age			28.5±7.9			27.7±7.2	0.731*
Maternal education (years)			10.9±2.5			9.6±3.2	0.136*
Primiparous	12	60.0		10	38.5		0.147**
Working during pregnancy	11	55.0		10	38.5		0.264**
Presence of partner	16	80.0		19	73.0		0.585**
Type of Delivery							
Vaginal	5	25.0		9	34.6		0.482**
Cesarean	15	75.0		17	65.4		
Previous abortions	4	20.0		8	30.8		0.409**
Newborn							
Male	9	45.0		14	53.8		0.552*
Gestational age (weeks)			32.0±0.9			31.8±2.1	0.357*
Birth weight (g)			1583±302			1619±405	0.367*
Apgar scale 1'minute			7.2±1.9			7.2±1.8	0.494*
Apgar scale 5'minutes			9.1±0.9			8.8±1.0	0.244*
Weight for gestational age							
Small for gestational age	4	20.0		4	15.4		0.356**
Appropriate for gestational age	14	70.0		15	57.7		
Large for gestational age	2	10.0		7	26.9		

Note: *Analysis by Student's *t* test; **Pearson's Chi-square test. [a]n=20; [b]n=26. UCINCa: Kangaroo Neonatal Intermediate Care Unit; UCINCo: Conventional Neonatal Intermediate Care Unit; SD: Standard Deviation.

Table 2 – Length of stay and frequency of exclusive breastfeeding at hospital discharge and at 4 months corrected age, according to the inpatient unit. *Santa Maria* (RS), Brazil, 2019-2020.

Variables	UCINCa		UCINCo		*p**
Length of stay (days) [a,c]	24 (19.5-37.5)		27 (19-42)		0.602*
	n	%	n	%	
EBF at hospital discharge					
Yes	15	75.0	6	23.1	<0.001**
No	5	25.0	20	76.9	
EBF at 4 months corrected age[b,d]					
Yes	7	35.0	2	8.3	0.029**
No	13	65.0	22	91.7	

Note: *Mann-Whitney U test (values expressed as median 1st and 3rd quartile); **Pearson's Chi-square test. The total of variavels from UCINCa is: [a]n=20; [c]n=20. The total of varialvels from UCINCo is: [b]n=20; [d]n=24. UCINCa: Kangaroo Neonatal Intermediate Care Unit; UCINCo: Conventional Neonatal Intermediate Care Unit; EBF: Excusive Breastfeeding.

Table 3 – Frequency of introduction of complementary feeding at four months and of breastfeeding at six and 12 months of corrected age. *Santa Maria* (RS), Brazil, 2019-2020.

Variables	UCINCa		UCINCo		*p**
	n	%	n	%	
Food introduction at 4 months corrected age[a,d]					0.955
Yes	9	45.0	11	45.8	
No	11	55.0	13	54.2	
Breastfeeding at 6 months corrected age[b,e]					0.326
Yes	9	50.0	8	34.8	
No	9	50.0	15	65.2	
Breastfeeding at 12 months corrected age[c,f]					0.564
Yes	7	38.9	6	30.0	
No	11	61.1	14	70.0	

Note: *Pearson's Chi-square test. The total of variavels from UCINCa is: [a]n=20; [b]n=18; [c]n=18. The total of varialvels from UCINCo is: [d]n=24; [e]n=23; [f]n=20. UCINCa: Kangaroo Neonatal Intermediate Care Unit; UCINCo: Conventional Neonatal Intermediate Care Unit.

The food consumption indicators at six and 12 months of corrected age are described in Table 4. As for the indicators of diet quality, at six months it was found that 22.2% of the infants from UCINCa were fed a dietary diversity, while at UCINCo this diversity occurred in 47.8% of the sample. At 12 months, dietary diversity was higher in infants from UCINCa (88.9%) compared to infants from UCINCo (65%), with no significant differences between groups. Regarding the consumption of ultra-processed foods, it was 38.9% in UCINCa infants and 70% in UCINCo infants at 12 months of corrected age and no statistically significant difference between the groups was observed.

Table 4 – Food consumption indicators at six and 12 months of corrected age according to the neonatal inpatient unit. *Santa Maria* (RS), Brazil, 2019-2020.

Variables	6 months				*p**	12 months				*p**
	UCINCa[a]		UCINCo[b]			UCINCa[c]		UCINCo[d]		
	n	%	n	%		n	%	n	%	
Adequate frequency of meals**					0.445					0.417
Yes	11	61.1	15	68.2		12	66.7	15	75.0	
No	7	38.9	7	31.8		6	33.3	5	25.0	
Minimum food diversity					0.085					0.877
Yes	4	22.2	11	47.8		16	88.9	13	65.0	
No	14	77.8	12	52.2		2	11.1	7	35.0	
Iron-rich foods					0.691					0.616
Yes	1	5.6	1	4.3		3	16.7	3	15.0	
No	17	94.4	22	95.2		15	83.3	17	85.0	
Vitamin A consumption					0.087					0.152
Yes	18	100	19	82.6		16	88.9	14	70.0	
No	0	0	4	17.4		2	11.1	6	30.0	
Consumption of ultra-processed products					0.453					0.054
Yes	4	23.5	7	30.4		7	38.9	14	70.0	
No	13	76.5	16	69.6		11	61.1	6	30.0	

Note: *Fisher's Exact Test; **Adequate frequency of meals: at 6 months, having consumed two fruits and one salty food, and at 12 months, having consumed two fruits and two salty foods. 6 months: the total of variavels from UCINCa is: [a]n=18 and UCINCo is: [b]n=23. 12 months: the total of variavels from UCINCa is: [c]n=18 and UCINCo is: [d]n=20. UCINCa: Kangaroo Neonatal Intermediate Care Unit; UCINCo: Conventional Neonatal Intermediate Care Unit.

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DISCUSSION

In this study, a significantly higher frequency of exclusive breastfeeding was observed in the infants of the UCINCa, in comparison with those of the UCINCo at hospital discharge and at four months corrected age. As for the introduction of complementary feeding, being from the UCINCa did not prove to be protective, since about 45% of the infants in both units had started with the early intake of other foods, at four months of corrected age.

Some authors refer that PTNB mothers who participate in the KMC practice have a greater potential of exclusive breastfeeding at discharge from the neonatal unit, and for a longer period, about one to three months, when compared to mothers of children undergoing conventional care [10,14]. The KMC is a health practice that facilitates breastfeeding, as mothers gradually become trained in skills and responsibilities with their child, identifying needs and providing care, both physical and emotional [21]. In the present study, breastfeeding results at the time of hospital discharge and at four months corrected age, corroborate the findings in the literature. The continuous maternal presence seems to provide security to mothers while allowing more frequent breastfeeding experiences to the PTNB, when compared to PTNB who are in conventional care. Although hospital routine allow mothers to be continuously present in the conventional care unit, their presence is less frequent both for breastfeeding and for care, which may explain this finding.

Among the factors that influence breastfeeding, the literature described some maternal characteristics that tend to be protective, such as: being married, getting support from a partner and having a higher level of education [21]. The protective role of these conditions was not observed in our study, since almost all the mothers reported having a partner, and the level of education was rather similar among them. With regard to the characteristics of the preterm newborns that influence breastfeeding, the higher gestational age at birth, shorter time on invasive ventilation and hospital stay are reported [21] among others. It should be noted that, in the present study, the gestational age at birth and the length of hospital stay did not differ between the groups.

At four months of corrected age, 35% of the infants from the KMC group and 8.3% of the infants who had been in conventional care were on exclusive breastfeeding. These findings corroborate a study carried out in a public hospital in the city of São Paulo (SP), that found a 43.5% prevalence of EBF in the third month of life for PTNB belonging to the Kangaroo Mother Care and of 5% for those who received conventional care during the period of hospital stay [22]. A much lower percentage of EBF (14.4%) was observed in a cohort of preterm infants under KMC, at four to five months of corrected age, in the Northeast region of Brazil [23]. Higher percentages, 81.7% versus 75.3%, were reported by Charpak *et al.* [24]; however not only infants in exclusive breastfeeding, but also in mixed breastfeeding were included in the sample. The studies described above corroborate our findings, confirming the effect and the benefit of Kangaroo Mother Care in connection with breastfeeding, especially in the first months of life.

At six and 12 months corrected age, breastfeeding rates were similar in infants discharged from UCINCa and UCINCo. This observation was confirmed by other authors, who also found no influence of KMC on the breastfeeding frequency in infants from six months of age onwards [24,25]. A few negative aspects contribute to the discontinuation of breastfeeding, such as inadequate maternity leave, lack of opportunities to breastfeed and milk in the workplace [26]. In the present study, 55% of the UCINCa mothers and 38.5% of the UCINCo mothers reported working during the pregnancy period. Although the return to work variable has not been investigated, the fact that mothers worked during pregnancy can lead to infer that there was a return to work during the exclusive breastfeeding period, impairing EBF maintenance.

It is important to highlight that from the time of hospital discharge, PTNB may be weaned. A study comparing the first month after PTNB hospital discharge mentioned cultural and educational factors among the main causes of early weaning: consisting in the introduction of other foods/liquids, insufficient mother's milk, in addition to the custom of giving PTNB teas and water [27].

The introduction of infant formulas or other types of milk competes directly with the duration of breastfeeding [28]. Furthermore, there is evidence that the introduction of solid foods in PTNB occurs very early, well before the recommended age for full-term children [29,30]. This may be associated with the fact that some mothers consider the baby's chronological age for the introduction of food, and not the corrected age. The impact and consequences of early food introduction in PTNB should be reviewed with great caution, as it can hinder future food acceptance. In a systematic review on complementary feeding in PTNB, Liotto *et al.* [30] indicate that the literature available does not offer guidelines on complementary feeding management in this group of children. Still, there is a tendency towards early food introduction, which can be partially attributed to family members inadequate nutritional education.

In our study, a pattern of breastfeeding early discontinuation was observed, since at four months of corrected age, about 45% of the infants had started complementary food intake. The existence of food guides helps professionals and family members to introduce food, with quality and safety, in a timely manner. However, those guides are mostly referring to term children, such as the guide of the World Health Organization, the European Society of Pediatrics, the Italian Society of Pediatrics, the American Food Guide and the Food Guide for Brazilian Population under 2 years of age [31-34,15]. The Brazilian guide recommends, in the case of premature children, that the time when food should be offered is the responsibility of the health professional [15].

To start food introduction in PTNB, it is important to consider the corrected age and the presence of signs of readiness to accept solid foods, with infant individualized assessment, taking into account their neuropsychomotor development and the recommendation to initiate at the corrected age of six months [16]. The Brazilian Society of Pediatrics recommends that the beginning of complementary feeding should be in accordance with the infant's neurological maturity, starting at six months corrected age for children in EBF and earlier, at three months CA, for PTNB who receive only milk formula [35].

In a systematic review on food introduction in preterm infants, Liotto *et al.* [30] the lack of specific guidelines, suggesting that food introduction may occur between five and eight months of chronological age, with at least three months corrected age, and always associated with the development of oral ability. For this reason, the authors suggest that an individualized assessment of the child be carried out, focusing on his/her global development. In the case of PTNB who developed some oral dysfunction, they recommend a multidisciplinary evaluation carried out by pediatricians, nutritionists and speech therapists specialized in oral motor function [30].

Despite the lack of consensus on the optimal time to start complementary feeding in premature babies, early introduction can be harmful, especially if it occurs between three and four months corrected age as it can cause feeding problems in the early stages of life and during childhood. These disorders include irritability, stress, choking, nausea and vomiting, in addition to an increased risk of hospitalization, mainly due to diarrhea and lower respiratory tract infection [36,37]. The best time to start food-feeding PTNB is after six months corrected age [37].

The appropriate time to start complementary feeding should be duly assessed just like the quality of food offered to children. At six months of age, a diet with low dietary diversity should be considered, and only 22.2% of the infants from UCINCa, during hospitalization, consumed six food groups the day before the survey. Other authors also found a low dietary diversity at six months of age, which may cause

a monotonous feeding besides contributing to the worsening of the main nutritional deficiencies [38,39].

We found a high rate of infants who consumed ultra-processed foods the day before the interview at 12 months corrected age. A study carried out in southern Brazil describes a 19.7% contribution of ultra-processed foods in the total daily energy intake of children under 24 months of age [40]. These results enhance the finding of a high consumption of ultra-processed foods in the child population. Initiatives to encourage the consumption of fresh and minimally processed foods should be carried out aiming at the childhood.

Limitations of the study include the small size of the sample for a study power of at least 80%, and the convenience sampling, since our study was carried out in a single hospital. In addition, other limiting factors should be mentioned, such as the restricted number of beds allocated to the KMC practice; the sample loss in the 12-month follow-up; the lack of monitoring of the time that the mothers remained in the kangaroo position and the time that the UCINCo mothers remained in the unit; the absence of multivariate analyses due to the small sample size and failure to perform the third stage of the KMC. This third stage consists of continuous care for the PTNB with care at home, at the Health Unit in the infant dwelling area and maintaining connections with the relevant maternity hospital [41]. However, it should be noted that the hospital where the study was carried out has a PTNB outpatient follow-up service.

Despite the limitations, it is believed that the findings of this study are consistent with the reality of the feeding development of preterm children. Specific recommendations and protocols for PTNB are required to guide families as to the appropriate time for food introduction. Likewise, all PTNB undergoing or not the KMC practice must be followed up after hospital discharge, to encourage and promote exclusive breastfeeding until the sixth month of life and indicate the introduction of food at the appropriate time, so that it occurs safely and with quality.

CONCLUSION

The results of the present study confirmed the benefit of the Kangaroo Mother Care on breastfeeding in PTNB, especially in the first four months of life. Hospitalization in the Kangaroo Neonatal Intermediate Care Unit provided a significant increase in the rate of exclusive breastfeeding at hospital discharge and at four months corrected age, compared to conventional care. The Kangaroo Mother Care did not prove to be protective for breastfeeding after six months of corrected age and to help avoid the early introduction of complementary feeding and also for a better diet quality during the first year of life, as could be observed by the high rate of ultra-processed foods consumption by infants.

CONTRIBUTORS

CR CIOCHETTO participated in the conception and elaboration of the article, analysis and interpretation of data. GP BOLZAN participated in the conception and design of the study and review of the article. ARM WEINMANN participated, as advisor, in the analysis and interpretation of data and in the review and approval of the final version of the article.

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