Original Article

Characteristics of skin-to-skin contact in Brazilian neonatal units: a multicenter study

Características do contato pele a pele em unidades neonatais brasileiras: estudo multicêntrico

Características del contacto piel con piel en unidades neonatales brasileñas: estudio multicéntrico

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Abstract

Objective: To describe the beginning, duration, location and who makes skin-to-skin contact in Brazilian neonatal units.

Methods: This is a descriptive, longitudinal multicenter study, carried out from May 2018 to March 2020, in five reference neonatal units for Kangaroo Mother Care in Brazil, which included newborns weighing up to 1,800 grams. Maternal and newborn characteristics were collected from medical records and interviews. Skin-to-skin contact was recorded on cards attached to the bed, filled in by the team and fathers. Analysis occurred through descriptive statistics.

Results: We included 405 newborns, 51.4% male, median gestational age of 31.4 weeks and birth weight of 1,412 grams. Regarding skin-to-skin contact time, the median daily contact frequency was 1.5 times (IQR: 1.2 - 2.4), the time/day was 147 min/day (IQR: 106.7 - 263.0) and the first contact at five days of life (IQR:4.0-8.0). The longest contact time/day was performed by mothers, with a median of 137.8 minutes per day (IQR:95.6-232.1), and the second stage of kangaroo Mother Care, kangaroo Intermediate Care Unit, was the place where contact was performed for the longest time, with a median of 184.4 minutes per day (IQR:124.7-455.4).

Conclusion: In the units assessed, skin-to-skin contact is practiced intermittently, a few times a day, predominantly by mothers and with longer exposure time in the second stage. It is necessary to seek ways that allow more encounters between mother/father-child and that gives conditions of greater permanence of fathers in the hospital.

Resumo

Objetivo: Descrever o início, duração, local e quem realiza o contato pele a pele em unidades neonatais brasileiras.

Métodos: Estudo multicêntrico descritivo, longitudinal, realizado de maio de 2018 a março de 2020, em cinco unidades neonatais referência para o Método Canguru no Brasil, que incluiu recém-nascidos com peso até 1800g. As características maternas e dos recém-nascidos foram coletadas em prontuários e entrevistas. A prática do contato pele a pele era registrada em cartões anexados ao leito, preenchidos pela equipe e pelos pais. A análise ocorreu por meio de estatística descritiva.

Resultados: Foram incluídos 405 recém-nascidos, 51,4% do sexo masculino, mediana de idade gestacional de 31,4 semanas e de peso ao nascimento de 1.412g. Em relação ao tempo de realização do contato pele a pele, a mediana da frequência do contato diário foi de 1,5 vezes (IIQ: 1,2 - 2,4), o tempo/dia de 147 min/

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dia (IIQ: 106,7 - 263,0) e a realização do primeiro contato aos cinco dias de vida (IIQ:4,0-8,0). O maior tempo de contato/dia foi realizado pelas mães, com mediana de 137,8 min/dia (IIQ:95,6-232,1) e a segunda etapa do Método Canguru, Unidade de Cuidados Intermediários Canguru, foi o local onde se realizou por maior tempo o contato, com mediana de 184,4 min/dia (IIQ:124,7-455,4).

Conclusão: Nas unidades avaliadas, o contato pele a pele é praticado de forma intermitente, poucas vezes por dia, predominantemente pelas mães e com maior tempo de exposição na segunda etapa. É necessário buscar meios que possibilitem mais encontros entre mãe/pai-filho e que dê condições de maior permanência dos genitores no hospital.

Resumen

Objetivo: Describir el inicio, duración, lugar y quién realiza el contacto piel con piel en unidades neonatales brasileñas.

Métodos: Estudio multicéntrico descriptivo, longitudinal, realizado de mayo de 2018 a marzo de 2020, en cinco unidades neonatales de referencia del Método Canguro en Brasil, que incluyó recién nacidos de hasta 1800 g de peso. Las características maternas y de los recién nacidos fueron recopiladas en historias clínicas y entrevistas. La práctica del contacto piel con piel fue registrada en tarjetas anexadas a la cama, completadas por el equipo y por los padres. El análisis se realizó mediante estadística descriptiva.

Resultados: Se incluyeron 405 recién nacidos, 51,4 % de sexo masculino, mediana de 31,4 semanas de edad gestacional y de 1412 g de peso al nacer. Con relación al tiempo de realización del contacto piel con piel, la mediana de la frecuencia del contacto diario fue 1,5 veces (IIQ: 1,2 - 2,4), el tiempo/día fue de 147 min/día (IIQ: 106,7 - 263,0) y la realización del primer contacto a los cinco días de vida (IIQ:4,0-8,0). El mayor tiempo de contacto/día fue realizado por las madres, con una mediana de 137,8 min/día (IIQ:95,6-232,1) y la segunda etapa del Método Canguro, la Unidad de Cuidados Intermedios Canguro, fue el lugar donde se realizó el contacto por mayor tiempo, con una mediana de 184,4 min/día (IIQ:124,7-455,4).

Conclusión: En las unidades analizadas, el contacto piel con piel se practica de forma intermitente, pocas veces por día, predominantemente por las madres y con mayor tiempo de exposición en la segunda etapa. Es necesario buscar medios que permitan más encuentros entre madre/padre-hijo y que ofrezcan condiciones de mayor permanencia de los progenitores en el hospital.

Introduction

Kangaroo Mother Care (KMC) has been used worldwide as an intervention capable of qualifying newborn (NB) care and contributing to the reduction of neonatal morbidity and mortality.[1-3] According to the World Health Organization, the main guidelines that define KMC are skin-to-skin contact (SSC) between mother and NB, breastfeeding and outpatient follow-up.[4] In Brazil, since 2000, KMC is a public health policy that includes qualified, comprehensive and humanized care, relying on four basic foundations that cover family care, respect for singularities, mothers' involvement in child care and SSC promotion.[5]

Studies have shown that SSC is a safe alternative to conventional care in perinatal care,[6] with favorable results related to reducing the risk of serious infections, hypothermia,[7] hypoglycemia, hospital readmission, greater weight gain, increased time of exclusive breastfeeding,[8] best mother interaction with the child,[9] greater NB stress regulation[10] and better emotional development in the first year of life,[11] in addition to reduced neonatal mortality.[3,6]

Despite the many evidences regarding the benefits, the recommended length of stay in SSC is quite divergent in different countries.[8] In Brazil, it is recommended to encourage fathers to use SSC for as long as it is comfortable and pleasurable for both, with a minimum time of one hour for physiological reasons.[5]

The great diversity of this practice occurs because there is still no consensus in the literature on the ideal time necessary to ensure the benefits already demonstrated. Important systematic reviews published could not determine the minimum time required to observe these positive effects, mainly due to the wide variety in SSC duration in the studies included in these reviews.[6,8]

Thus, the present study aimed to describe the beginning, duration, location and who performs SSC in Brazilian neonatal units.

Methods

This is a descriptive, longitudinal study that is part of a multicentric study entitled "*Efeito do tempo de exposição ao CPP sobre os desfechos clínicos em recém-nascidos de baixo peso*". Five reference units for KMC participated in this research, two from the Northeast, two from the Southeast and one from the South. The study was conducted from May 2018 to March 2020.

Fathers who accepted participating signed the Informed Consent Form. All live births in these in-

stitutions during the study period that met the following criteria were considered eligible: single birth, birth weight up to 1,800 grams, without malformations, severe perinatal asphyxia and genetic syndromes. Non-inclusion criteria were: NBs whose mother had diagnosed psychiatric and/or behavioral disorders, or was seropositive for the human immunodeficiency virus (HIV). Exclusion criteria were: NBs with symptomatic congenital infection; NBs who did not undergo SSC at any time during hospitalization; NBs who were discharged from the neonatal unit or died within the first seven days of life; NB who developed severe bronchopulmonary dysplasia or severe alteration of the Central Nervous System (CNS); NBs whose mother had a serious illness or other maternal problems; and NBs whose mother died during the hospitalization period. At the end of the study, 180 NBs were also excluded due to follow-up losses (Figure 1).

The sample size calculation was based on the frequency of the result in a population of 50% and a 95% confidence level (CI). The final number required was 384 individuals.

Maternal and neonatal variables were collected through medical records or questionnaires applied during the hospitalization period. The maternal variables collected were age, education, marital status, economic class, parity, type of birth and knowledge about KMC. The neonatal variables were weight, gestational age (GA) at birth, sex (male or female), severity index using the Score for Neonatal Acute Physiology - Perinatal Extension II (SNAPPE II), measured in the first 12 hours of NBs' life,[12] and length of hospital stay.

Regarding the characteristics of performing SSC, we analyzed the time from start to the first contact (in days of life), frequency of performing SSC per day, duration of each contact (in minutes), mean time of SSC performed per day and by morning, afternoon and night shifts (in minutes/day), total time of SSC during hospitalization performed by mother and father (in minutes), mean time per day performed by mothers and KMC stages (in minutes/day).

The mean time per day was calculated by dividing the total time of SSC (maternal and paternal) during hospital stay by the number of days in which this contact was made. Likewise, the mean time per shift, per mother and per KMC stage was obtained by dividing the total time of SSC in each category

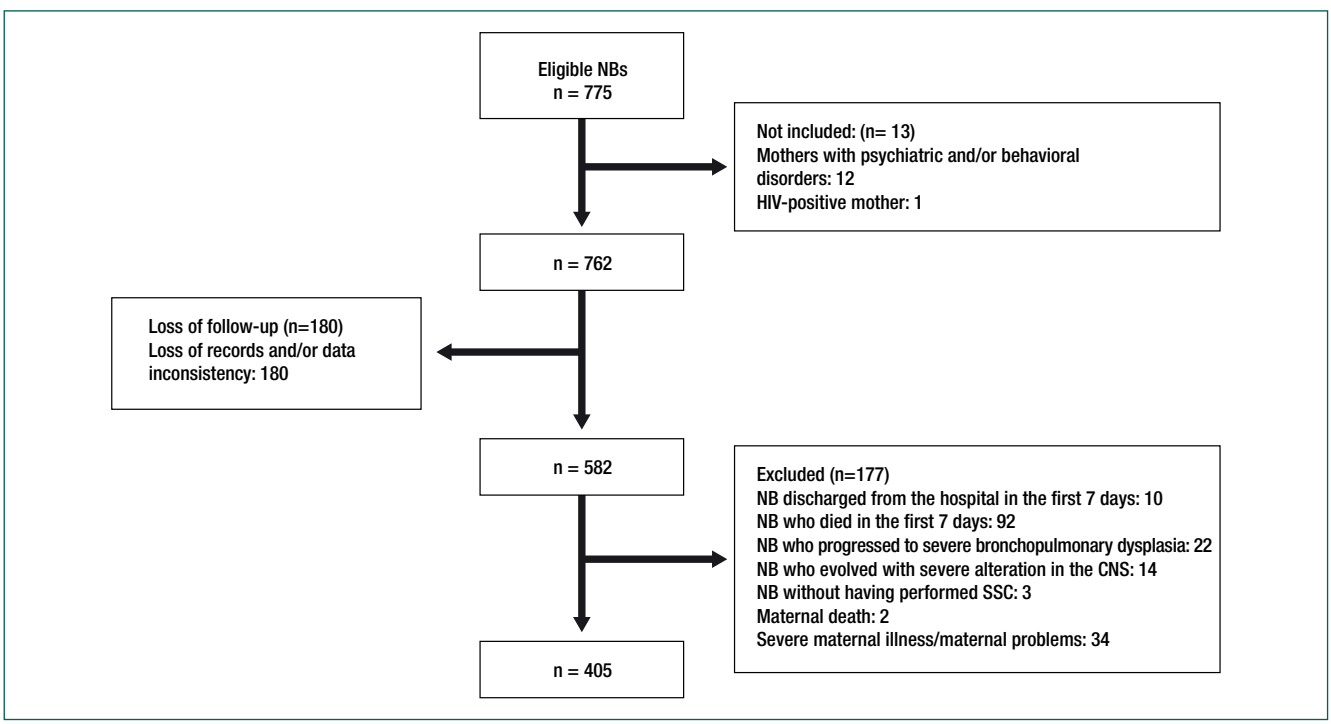

Figure 1. Sample flowchart

by the number of days of this contact. It was not possible to calculate the mean time of paternal SSC, since, despite having collected the total time of SSC between father and child, there is no information on the number of days the father was present at the unit.

It is emphasized that the application of KMC in Brazil is developed in three stages.[5] The first took place in the Neonatal Intensive Care Unit (NICU) and/or in the Conventional Neonatal Intermediate Care Unit (CoNICU), the second, at the Kangaroo Intermediate Care Unit (KaINCU), and the third, after hospital discharge until they reached 2,500 grams.

SSC was recorded on cards attached to the bed, being filled out by the health team at the beginning of hospitalization in the Neonatal Unit. From then on, fathers were progressively encouraged to register when NBs were already at CoNICU or KaINCU. This card recorded the start time, end time and period of the day of each SSC, in addition to who performed it (mother or father). These records were checked daily by auxiliary researchers, previously trained, who made contact with fathers and professionals and consolidated the data in their own form.

The data collected regarding mothers, NB and SSC were registered in Google Forms and later exported to a Microsoft Office Excel spreadsheet, version 2016.

The sample was analyzed using descriptive statistics, using medians and interquartile ranges (IQR) for continuous variables, as they did not meet the criterion of normal data distribution, verified by statistical test (Shapiro Wilk). Categorical variables are presented according to absolute and relative frequencies.

The study was approved by a Research Ethics Committee (Opinion 270,959), with CAAE (*Certificado de Apresentação para Apreciação Ética* - Certificate of Presentation for Ethical Consideration) 83803817.0.1001.5086.

Results

Of the 405 NBs analyzed, 51.4% were male, the median gestational age was 31.4 weeks, birth weight was 1,412 grams and the severity score was 5 (SNAPPE II). NBs' mothers were predominantly young adults aged between 20 and 34 years (63.5%), had a partner (82.1%), were primiparous (50.6%) and the most frequent route of birth was cesarean section (66.7%). Most mothers (69.7%) reported being unaware of the KMC, with the current hospitalization being their first experience. Table 1 shows the other characteristics of mothers-children.

Table 1. Maternal and neonatal characteristics of the dyads assessed on the performance of skin-to-skin contact in the reference units for Kangaroo Mother Care (n= 405)

Neonatal variables	n(%)	Median (Q1 - Q3*)
Male	208(51.4)	
Gestational age (weeks)		31.4 (29.1-33.3)
Weight (grams)		1.412 (1.164-1.605)
SNAPPE II**		5 (0-15)
Length of stay		34 (25-52)
Maternal variables		
Age (years)		
<20	66(16.3)	
20 – 34	257(63.5)	
≥35	82(20.2)	
Education		
No education/incomplete ES***	47(11.8)	
Complete ES/incomplete HS****	108(27.1)	
Complete HS/incomplete higher education	200(50.2)	
Complete higher education	43(10.8)	
Economic class		
A-B	47(14.6)	
C	136(42.4)	
D-E	138(43.0)	
Marital status		
With a partner	330(82.1)	
Primiparity	205(50.6)	
Route of birth		
Caesarean section	270(66.7)	
Did not know Kangaroo Mother Care	228(69.7)	

*Q1-Q3 - Interquartile ranges; **SNAPPE II - Score for Neonatal Acute Physiology - Perinatal Extension II; ***ES - elementary school; ****HS - high school

It was observed that the median frequency of SSC was 1.5 times/day, the duration of each contact was 94 minutes (1 hour and 34 minutes) and the performance of the first SSC on the 5th day of a NB's life. During NB hospitalization, the median SSC performed was 147 minutes/day, with the median total SSC time with the mother being 2496.5 minutes/hospitalization and with the father 35 minutes/hospitalization (Table 2). The longest exposure time/day to SSC was observed in the second KMC stage (KaINCU), with a median of 184.4 minutes/day (Table 2).

Table 2. Characterization of skin-to-skin contact in reference units for Kangaroo Mother Care (n=405)

Variable	Median	Q1-Q3 (interquartile range)
First SSC (in NB's days of life)	5	4 - 8
SSC frequency/day	1.5	1.2 - 2.4
SSC duration at each moment (min)	94.2	75.4 - 116.7
Total SSC time with mother (min)	2496.5	1172.5 - 6557.5
Total SSC time with father (min)	35	0 - 370
SSC time/day (min/day)*	147.0	106.7 - 263.0
SSC time/morning (min/day)	53.9	33.1 – 82.9
SSC time/afternoon (min/day)	70.0	52.8-105.0
SSC time/night (min/day)	26.6	6.2 – 98.3
SSC time/day with mother (min)	137.8	95.6 – 232.1
SSC time/day in the first stage (min/day)	110.9	85.8 - 152.0
SSC time/day in the second stage (min/day)	184.4	124.7 - 455.4

*SSC (skin-to-skin contact) time/day, calculated in total minutes during hospitalization divided by the days in which contact was practiced.

Discussion

SSC in Brazilian neonatal units investigated was performed, mainly by the mother, intermittently, with a median stay of 94 minutes at a time. The median of the total time was 147 minutes/day and the frequency of use was one and a half times/day.

The time of exposure to SSC in the present study was considered less than ideal for these NBs. Although there is no consensus on the minimum time after which the chance of occurrence of favorable outcomes is greater, the literature has presented studies that often use times longer than those verified in this investigation. A meta-analysis showed that performing at least 6h/day of SSC had a direct impact on neonatal growth,[13] another study observed an association between SSC use for more than 3 hours a day with reduction of neonatal sepsis in very preterm NBs.[14] A randomized clinical trial also demonstrated that prolonged SSC 4 hours a day reduced outcomes of necrotizing enterocolitis and neonatal sepsis in preterm under respiratory support.[15] A retrospective study pointed to the promotion of breastfeeding in NBs under 29 weeks, when SSC was performed for more than 3 hours a day.[16]

However, intermittent SSC, interspersed with periods of conventional care in incubators or warm cribs, seems to be the most common form of use in several countries. This fact was observed in a systematic review, in which 66% of studies had SSC time of less than 4 hours a day.[8]

The first SSC performed in the Neonatal Units of this study occurred at a median of five days of life of NBs. Two randomized clinical trials, carried out in Africa and India, showed benefits mainly related to breastfeeding in NBs who practiced SSC early. The first study assessed the long-term effects of SSC in Madagascar and found that when performed within the first 24 hours of life (median = 20.5 hours) it resulted in a higher proportion of exclusive breastfeeding (EBF) at six months of age.[17] The study in India showed that SSC started within four days of birth positively impacted the continuity of breastfeeding after discharge.[18] Moreover, a prospective cohort study observed that the early beginning of SSC (median=4.3 days) in preterm infants, even when using respiratory support and/or with an umbilical catheter, had a positive effect on establishing complete enteral feeding in shorter time and with exclusive use of breast milk in relation to the control group.[19] Another important object of study, neonatal death, was investigated in a multicenter clinical trial, which associated the very early beginning of SSC (median = 1.3 hours) after birth with a 25% reduction in this outcome.[3]

In this research, the beginning of the first SSC with a median time of 5 days, may be related to institutional routines of minimal handling up to 72 hours of life, especially for very preterm NBs. This would be associated with concerns about changes in cerebral blood flow, which could increase the risk of intracranial hemorrhage. However, a previous study showed that the change in NB head positioning did not alter cerebral oxygenation and was not related to the incidence of intracranial hemorrhage.[20]

Another barrier to the earlier beginning of this practice may have been the cesarean delivery route, predominant in this study, which makes it difficult for mothers to travel to the Neonatal Unit in the most immediate postoperative period. It is known that the severity of NBs also makes an early SSC impossible, since the current WHO recommendation is to perform it after clinical stability.[4] However, the study sample had a median SNAPPE-II score (which considers those with >37 points to be at greatest risk for mortality) well below the considered risk for mortality,[12] which would not justify performing this first SSC late.

The difficulty in keeping the mother hospitalized for longer and the fear of placing NBs in SSC also interfere with the precocity of this first SSC while the latter is on ventilatory support. Thus, it is necessary to recognize and encourage early SSC as a safe intervention capable of promoting greater physiological stability for NBs.[21]

This study pointed to an almost exclusive participation of mothers in SSC (93.6%). Although in Brazil the term "Kangaroo Mother Care" has been replaced by "Kangaroo Care", in order to encourage paternal participation in this care process,[5] which in fact can suffer the influence of numerous factors. Sociocultural contexts influence cultural constructions of gender and the roles to be played by fathers and mothers in child care.[22] Another possible explanation for the limitation of parental participation may be related to difficulties regarding team institutional organization[23] and prejudice that, although it recognizes changes in the role of fathers in the family context, still faces difficulties in involving them in this care.[24]

Father's participation is fundamental, as they transmit confidence and comfort to children and mothers.[25] In addition to this, fathers' involvement favors the exercise of paternal role, which is a cultural and not a biological fact, which can also reduce home abandonment rates.[26] Thus, all cultural and social difficulties need to be considered in this approach, such as paternity leave length. Furthermore, the health team must be empathetic and prepared to include them in all stages of their child's care.

The health services where this study was carried out are reference centers for KMC and have beds available at all stages of the method. In the second stage (KaINCU), there was a longer SSC /day in relation to the period of hospitalization in the first (NICU and CoNICU). However, an even longer time for SSC was expected at the KaINCU, since there is a welcoming structure for mothers and they remain full-time with the child. Ensuring fathers to remain in full capacity during their children's hospitalization allows for greater encounters between the dyads, strengthens the bond and offers greater chances of positive outcomes.[5]

Mothers' educational level and socioeconomic vulnerability probably influenced the use of SSC during neonatal hospitalization, since 38.9% did not complete or did not even attend high school, while 42.9% said they belonged to the economic class D/E. Furthermore, most women did not know the KMC, and the current hospitalization was their first experience. Maternal education, considered a marker of socioeconomic status, is related to the cultural and behavioral profile that intrinsically influences NB health care as well as the continuity of this care after hospital discharge;[27] a fact described in a Brazilian study that observed this inadequacy of care in women with less education and in regions with less economic development of the country.[28]

A study carried out in the city of Kunshan, China, assessed prenatal care in combination with maternal educational level and concluded that the level of education remains a recognized factor that affects individuals' perception, attitudes and practice.[29] Thus, women with better education are more likely to put into practice the guidelines they receive regarding neonatal care, which can contribute to better SSC compliance.

SSC direct observation is not considered a limitation of this study. However, supervision of data recording was performed daily by the research assistant team until NBs were discharged, which made it possible to circumvent the memory bias of fathers and professionals and, consequently, reduce underreporting of records. Moreover, although the study sample is not considered representative of all regions of Brazil, we can consider it a good example of how SSC has occurred in our country. We also emphasize the pioneering nature of the study, whose SSC monitoring took place from NB length of stay to discharge.

Conclusion

This study showed that, in the assessed units, SSC is practiced intermittently, a few times a day, predominantly by mothers and more effectively in duration/day in the second stage of KMC (KaINCU). SSC can be improved in these units, since there is a need to promote paternal involvement in child care and to seek means that allow more time for the

mother/father-child dyads to meet during hospitalization. Thus, it is necessary to promote strategies that minimize the difficulties encountered, offering greater support to fathers and conditions for a longer stay in the hospital.

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Collaborations

Goudard MJF, Lamy ZC, Caldas LN, Marba STM, Costa R, Lima GMS, Azevedo VMGO and Lamy-Filho F contributed to study design, data analysis and interpretation, article writing, relevant critical review of the intellectual content and approval of the final version to be published.

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