



The skin to skin contact at birth and newborn crying during vaccination against Hepatitis B*

O contato pele a pele ao nascimento e o choro de recém-nascidos durante vacinação contra Hepatite B

El contacto piel con piel en el nacimiento y llanto del recién nacido durante la vacunación contra la Hepatitis B

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ABSTRACT

Objective: To test the effectiveness of skin to skin contact, between mother and child after birth, in reducing stress and pain behavior manifested by the cries of the newborn (NB), from the procedure of vaccination against Hepatitis B. **Methods:** This is a quasi-experimental comparative study covering 40 full-term newborns, divided into two groups, with or without skin contact with their mothers after birth, and were compared in terms of time crying during vaccination against Hepatitis B. **Results:** We observed, in both groups, changes in crying time during the phases of the process. **Conclusion:** The effect of contact in reducing crying time of neonates was not demonstrated statistically. Clinically, during the treatment time was observed Calling Syndrome caused by stress, as well as the effectiveness of the contact period in modulating the behavior of crying in newborns.

Keywords: Mother-child relations; Infant, newborn; Postpartum period; Crying

RESUMO

Objetivo: Testar a efetividade do contato pele a pele entre mãe e filho após o nascimento na redução do comportamento de estresse/dor manifestado pelo choro do recém-nascido (RN), decorrente do procedimento de vacinação contra a Hepatite B. **Métodos:** Estudo comparativo quase-experimental abrangendo 40 RN a termo, divididos em dois grupos, com ou sem contato pele a pele com suas mães após o nascimento, e que foram comparados quanto ao tempo de choro durante a vacinação contra Hepatite B. **Resultados:** Variações no tempo de choro foram observadas nos dois grupos durante as fases desse procedimento. **Conclusão:** O efeito do contato na diminuição do tempo de choro dos RN, não foi demonstrado estatisticamente. Clinicamente, a Síndrome do Chamado pelo Estresse foi observada, bem como a efetividade do período de contato, na modulação do comportamento de choro dos neonatos, enquanto estes estiveram sob o momento terapêutico.

Descritores: Relações mãe-filho; Recém-nascido; Período pós parto; Choro

RESUMEN

Objetivo: Comprobar la efectividad, del contacto piel con piel entre madre e hijo después del nacimiento, en la reducción del comportamiento de estrés y dolor manifestado por el llanto del recién nacido (RN), proveniente del procedimiento de vacunación contra la Hepatitis B. **Métodos:** Se trata de un estudio comparativo casi-experimental abarcando 40 RN a término, divididos en dos grupos, con o sin contacto piel con piel con sus madres después del nacimiento, y que fueron comparados en lo que se refiere al tiempo de llanto durante la vacunación contra la Hepatitis B. **Resultados:** Se observó en los dos grupos, variaciones en el tiempo de llanto durante las fases de ese procedimiento. **Conclusión:** El efecto del contacto en la disminución del tiempo de llanto de los RN, no fue demostrado estadísticamente. Clinicamente, durante el momento terapéutico, fue observado el Síndrome del Llamado causado por el estrés; así como la efectividad del período de contacto en la modulación del comportamiento del llanto en los recién nacidos.

Descriptores: Relaciones madre-hijo; Recién nacido; Periodo de posparto; llanto

* Study carried out in a maternity facility in the interior of São Paulo where teaching and research activities and community services are developed by the University of São Paulo at Ribeirão Preto, College of Nursing – Ribeirão Preto, SP, Brazil.

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INTRODUCTION

Transition from fetal to neonatal life involves a series of anatomic transformations, especially physiological changes, which when successful, ensure the newborn's (NB) self-maintenance at the end of the placental support period. At birth, the lungs must rapidly adapt to their function of exchanging gases, otherwise hypoxemia, hypercapnia and consequent acidosis secondary to labor and birth impede the process of adaptation to neonatal life⁽¹⁾.

Crying represents the beginning of this adaptation process. The first cry is considered physiological; through it blood is better oxygenated and the cardiovascular and respiratory systems are reorganized, which help to maintain homeostasis. For the medical and nursing teams it represents a sign of vitality and physiological adaptation⁽²⁾.

In general we say that crying is an essential part of the process of adaptation to outside womb life and acts directly on the NB's anatomical/physiological changes during this transition. However, it is also considered a global indicator of stress and can be triggered by both painful and painless procedures⁽³⁾.

Some authors draw attention to both immediate and long-term repercussions of excessive NB crying. Among them, they describe increased heartbeat and systemic and cerebral blood pressures, depletion of glucose and oxygen reserves, cerebral damage and cardiac disorders⁽⁴⁾.

Aware that hypoglycemia is one of the greatest difficulties faced by NBs during the first moments of life⁽⁵⁾ and considering that crying can represent an increase of 13% of energy spent in infants⁽⁶⁾, we question what the direct relationship between excessive crying and deleterious effects is in the period of adaptation to life outside the womb.

The fetus' sympathetic-adrenal system is activated in response to labor and birth according to the evidence of catecholamine levels in umbilical cord blood. These levels have several important purposes such as facilitating lung activity by activating the process of liquid absorption, improving cardiac activity and mobilizing glucose and free fatty acids. Thus, from an adaptive perspective, NB stress is important but may cause deleterious effects when exacerbated. Early maternal body contact can help maintain control of physiological parameters as a natural way to minimize the exacerbation of such effects⁽⁷⁾.

Skin-to-skin contact between mother and NB in the immediate post partum is one of the recommendations of the humanization policies of birth care⁽⁸⁾. Benefits attributed to this practice such as the establishment of affective bonding between mother and child, improved adaptive conditions to life outside the womb, early breastfeeding and late weaning have been proven, as well,

to be advantageous to women in the immediate puerperium and to reduce the likelihood of hospitalization due to neonatal jaundice^(7,9-17).

Some authors have already demonstrated the benefits of skin-to-skin contact between mother and child in relation to reduced crying time during painful procedures in infants just a few days old⁽¹⁸⁻²⁰⁾. As far as we know, there are no studies evaluating the effect of skin-to-skin contact immediately after birth in modulating pain/stress behavior manifested by the NB's crying time.

It is worth noting that the acute pain procedure was performed at the point of contact in the cited studies. The study⁽²¹⁾ showing that skin-to-skin contact's therapeutic action on the NB's central nervous system persists beyond the therapeutic moment motivated this study. Hence this study looks for a late effect in relation to reduced crying time after birth, which characterizes it as an unedited study.

The intramuscular injection of the Hepatitis B vaccine was selected as the acute pain procedure. This is a procedure established by the Ministry of Health as part of the first care delivered to NBs in the labor room. The first dose of the vaccine must be administered in the maternity facility in the NB's first twelve hours of life⁽²²⁾.

OBJECTIVE

To test the effectiveness of skin-to-skin contact between mother and child after birth in reducing stress/pain behaviors manifested by NB's crying due to vaccination for Hepatitis B.

METHOD

This is a quasi-experimental comparative study. Opting for such a design was necessary since randomization of the NBs between groups would lead to ethical implications, since skin-to-skin contact is recommended for all NBs with the necessary requirement to the therapeutic procedure. The study was carried out in a maternity facility in the interior of São Paulo, where teaching, research and community services are provided by the University of São Paulo at Ribeirão Preto, College of Nursing.

The population was composed of NBs who met the inclusion criteria from April to June 2008. Inclusion criteria were: NBs born through vaginal birth, whose mothers were in stable hemodynamic conditions and agreed to participate in the study; gestational age between 37 and 41 weeks and six days and Apgar grade ≥ 8 in the 1st minute of life. Exclusion criteria: syndromic NBs, with congenital diseases, or presenting impairment from poor adjustment to life outside womb.

The study received approval from the University of São Paulo at Ribeirão Preto, College of Nursing protocol

0863/2007. The binomials were only included in the study after the mothers provided their consent through a free and informed consent form.

The NBs included in the study totaled 40 individuals divided into groups of study: group A (n=20) was composed of NBs who immediately had skin-to-skin contact with their mothers, where they remained for 15 minutes⁽¹⁹⁾ and group B (n=20) was composed of NBs separated from their mothers after birth and directly sent to a heated crib. The criteria established for such selections were those normally used in the facility's routine; hence, the researchers did not interfere in the study environment. Among such criteria is the mothers' refusal to perform such contact, restricted involvement of the health team to encourage adherence to the practice, and especially the service's dynamics, which allied with limited human and structural resources, do not encourage the team to adopt such therapeutic actions in high demand situations.

The NBs from group B were kept for 15 minutes in the heated crib before data collection so that both groups would be equal in terms of time of life at the time of data collection. Vocalizations of newborns were recorded using an evaluation instrument during the 15 minutes they were in contact with their mothers (Group A) or waited in the heated crib for data collection (Group B) for later analysis and comparison.

The administration of the vaccine was the first procedure performed on NBs after birth; physical assessment and the remaining routine care were postponed so that the intramuscular injection was the first experience of acute pain in the life of the NBs in both groups.

A camera was continually focused in the NBs to measure crying time. All NBs were filmed for five minutes before the procedure (pre-injection period), during all the procedure's phases (antisepsis, puncture, injection and compression) and five minutes after the compression phase (recovery period). A blind analysis of images was later carried out and allowed measuring the crying time of each NB second by second during the procedure phase.

The technique to administer the vaccine followed the facility's protocol for administering intramuscular injections in NBs, so that the procedure was standardized among the auxiliaries who performed it.

The database was structured through the construction of a dictionary, in an Excel spreadsheet to code the

variables. The data were submitted to a double entry process so that the spreadsheets would not diverge after the validation process. Afterwards, the data were processed through descriptive (description of frequencies) and comparative (intra and inter-groups) statistics using the Statistical Package for the Social Science (SPSS) version 10.1.

Normality of distributions was tested using the non-parametric Kolmogorov-Smirnov test. The Student's *t* test was used when they were normally distributed to compare independent groups. When normality of distribution of such variables was not observed, the Mann-Whitney non-parametric test for two independent samples was used to compare the two groups.

RESULTS

According to information presented in Table 1, the sample of NBs at term was characterized as appropriate to gestational age (AGA) according to established inclusion criteria. The average weight at birth was 3,190g for group A and 3,325g for group B; these values do not differ in statistical terms. A significant difference was found in relation to the groups' average gestational age. The gestational age for group A was 272.4 days or 39 weeks while for group B it was 280.4 days of 40 weeks.

Table 2 – NBs according to total crying time in pre-injection phases, procedure and recovery according to the 'contact' group (A) and 'no contact' group (B) and respective *p*-values in the statistical tests. Ribeirão Preto, SP, Brazil. 2008

Crying time	Group A		Group B		<i>p</i> -value
	\bar{x}	SD	\bar{x}	SD	
Total Time (s)	144.1	140.3	102.8	110.4	0.30 ¹ (NA)
Pre-injection	55.8	68.4	29.2	56.1	0.18 ² (NA)
Procedure	20.8	8.8	19.2	8.9	0.57 ¹ (NA)
Recovery	67.5	69.4	54.35	55.4	0.51 ¹ (NA)

¹ Student's *t* test ² Mann-Whitney
(NA) There was no association between groups

During the skin-to-skin contact period, 19 NBs (95%) from Group A remained in silence and did not manifest any audible vocalization, though they were fully awake and active on their mothers' chests. Among the NBs from

Table 1 – NBs according to weight and gestational age corrected by ultrasound, according to the 'contact' group (A) and 'no contact' group (B) and respective *p*-values in the statistical test. Ribeirão Preto, SP, Brazil. 2008.

Variables	Group A		Group B		<i>p</i> ¹
	\bar{x}	SD	\bar{x}	SD	
Weight (g)	3190.0	92.5	3325.2	87.2	0.29 (NA)
Gestational age US (days)	272.4 (39s)	1.8	280.4 (40s)	1.7	0.02 (A)

² Student's *t* test \bar{x} = average SD = standard deviation
(NA) There was no association between groups (A) There was association between groups

group B, 15 (75%) presented non-measured episodes of crying while waiting for data collection in the heated crib.

The crying time counted in seconds in all phases of data collection for both groups is presented in Table 2.

An intra-group analysis revealed that NBs of both groups cried longer during the recovery phase. Group A presented higher average crying times in all phases and in the total period of collection, though the differences found between the groups were not statistically significant.

We stress that no differences between time of administration of vaccine in either groups were found.

DISCUSSION

Our sample included NBs at term with weight appropriate for the gestational age in both groups. The statistical difference between gestational ages is not clinically relevant since even with such a difference, the two groups were composed of NBs at term.

According to the results, group A composed of NBs who had previous contact with their mothers presented higher average crying time in comparison to the group who were immediately separated from their mothers in all phases of evaluation. This difference, though not statistically significant, was clinically evidenced and more accentuated in the pre-injection period (55.8 seconds of crying in group A and 29.2 in group B). This fact merits attention because it was the closest period to the therapeutic action.

This result can be discussed based on Christensson's(23) findings, whose study analyzed three groups of NBs for the period of 90 minutes. The first group was in contact with their mothers after birth, the second was separated from their mothers for whole period of evaluation and the last group was separated from their mothers for 45 minutes and was put in contact with their mothers for the remaining period. The results evidenced that babies recognize separation from their mothers and respond with crying, in a reflex known as "Separation Stress Call", recognized in many animal species. According to the author, such a defense mechanism ceases when contact with the mother is reestablished and might be genetically coded.

In the Christensson's(23) study, NBs in the group who were in contact with their mothers during the therapeutic period were analyzed, which certainly contributed to concluding that crying was almost absent, added to fact that this period covered a period of 90 minutes.

This conclusion confirms the results of this study since only one NB manifested vocalization; all the others remained in silence despite being awake and alert while they were with their mothers.

The soothing mechanism of skin-to-skin contact is still little studied(20). Several studies suggest an analgesic action, regulation of the NBs' organization state(18), the maternal

touch, that NBs recognize their mothers' voices and the smell of maternal milk as similar to the amniotic fluid(25).

The results presented in this study contradict some studies that analyze the therapy's analgesic effect concomitantly with an acute pain procedure. In a study(19) in which 30 NBs at term were submitted to heel puncturing, the authors concluded that the skin-to-skin maternal contact markedly reduced crying time (82%).

The authors(18) carried out a study aiming to compare the heel puncture in preterm NBs during skin-to-skin maternal contact with the procedure performed with NBs in an incubator, in reducing behavioral and physiological responses to pain. The average crying time during the baseline period of the puncture was smaller in the situation of contact than in the situation in which NBs were placed in an incubator.

A study with 31 preterm NBs with skin-to-skin maternal contact for 15 minutes, before and during the whole procedure, and 28 NBs kept in a crib or incubator during the whole procedure, concluded(20) that the average times significantly differed between the groups and was higher in the control group.

Studies addressing skin-to-skin maternal contact in the relief of neonatal stress/pain implemented the therapy simultaneously with the painful procedure, that is, these did not test for a late therapeutic effect.

The study(21) that evidenced the therapeutic action in NBs' central nervous system observing modulation of their behavior under stress and whose effects of immediate skin-to-skin contact persisted beyond the therapeutic moment, motivated this study however such results were not confirmed.

CONCLUSION

This study did not statistically demonstrate the late soothing effect of contact between mother and child after birth, during the intramuscular injection of the vaccine for Hepatitis B in reducing NBs' crying time. However, in agreement with other authors, the occurrence of the separation stress call was clinically observed and confirmed the moment of contact is valuable in the modulation of NBs' crying behavior while they were in therapeutic moment. These results support the discussion concerning the necessary valorization of the period immediately after birth in relation to the need to provide contact between mother and child.

This therapy, proven to be a method that controls crying and the exacerbation of stress during the NB's adaptation to life outside the womb, has the nursing team as an important ally. Nurses, aware of the role of this procedure in the process of the humanization in labor and birth, can significantly contribute to this practice's implementation.

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