

The Effect of Facilitated Tucking (FT) During Venipuncture on Duration of Crying in Preterm Infants

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Abstract

Introduction

Humans in the last trimester of gestation are assumed to be in a pain-free environment in the womb, but those neonates who are born preterm often spend weeks in the Neonatal intensive care unit (NICU) and undergo numerous painful procedures as part of their routine care.

Methods and Materials

In this semi-experimental study, 70 preterm infants born at average 32 to 36 weeks' Gestational age (GA), who needed routine blood collection, were allocated to two intervention (35 neonates) and control (35 neonates) groups. In experimental group a nurse held the infant in the side-lying, flexed fetal-type position during blood collection.

The stopwatch was used to determine the duration of crying infants. The control group did not receive additional action for pain relief. Data were analyzed by using SPSS version 16 software.

Results

The mean age of infants was 34.45 ± 1.22 weeks. The results showed that the duration of crying after sampling in the two groups was statistically significant difference, this duration in control group was higher than the intervention group ($P < 0.05$).

Conclusion

The results of this study indicate that the facilitated tucking is effective in reducing the duration of crying infant. Since neonatal pain management is an important part of infant care, attention to this subject can be a major step in promoting the growth and development of infants.

Key words: Crying, Facilitated tucking, Preterm infants, Venipuncture.

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Introduction

Infants that are born preterm arrive in an untimely manner before their anatomy and physiology are prepared to cope with an extra-uterine environment. As such, they are typically hospitalized in a comparatively hostile environment of the Neonatal intensive care unit (NICU) where they undergo numerous tissue-damaging procedures that are part of clinical care (1). Pain causes acute stress that can potentially lead to long-term complications. Preterm neonates are more vulnerable to these effects as the painful insult occurs during the critical window of brain development, exposing them to possible long-term developmental and psychological problems. Therefore, pain management in preterm neonates is a very important issue in the NICU (2).

From the above-mentioned, it is obvious that effective pain management is an important indicator of the quality of care provided to neonates, not only from an ethical standpoint, but also in terms of protecting the long-term outcome. Neonates cannot assert their rights, and their reactions to pain are not so evident as in adults. Moreover, medical treatment initially has a strong focus on saving their lives, accepting that well-being is only secondary. Inadequate pain management in neonatal life impairs the neurodevelopment outcome. It alters pain thresholds, pain and stress-related behavior, and physiologic responses in later life (3).

The most common procedures involve blood procurement for laboratory analysis and include heel lance and venipuncture (1).

Pharmacological management of pain has been rendered more difficult by the lack of good and reliable measures of a baby's response to pain(4).

Given the frequency of painful procedures in NICU and the difficulties with

pharmacological management, other approaches are required. Non-pharmacological interventions that have been tested in neonates that have shown varying degrees of efficacy can be categorized into sensory stimulation (positioning or swaddling, vestibular action or rocking, non-nutritive sucking, music), nutritive (oral sweet solutions) and maternal interventions (maternal odor and voice, breastfeeding, and skin-to-skin contact or Kangaroo care).

Facilitated tucking, in which a nurse or a parent holds the infant in the side-lying, flexed fetal-type position. The effects of facilitated tucking have been examined in both preterm and very preterm infants undergoing commonly performed tissue breaking procedures in the NICU and have been shown to diminish the magnitude of physiological and behavioral pain response (1,5).

The concept of developmental care encompasses a family-centered nursing care philosophy and multiple strategies designed to minimize the stress of the NICU environment for the infant and his/her family. Developmental care initiatives have been advocated in NICUs in attempt to minimize the risk for poor neurodevelopment outcomes for preterm infants. Elements of developmental care such as facilitated tucking and swaddling have been shown to provide comfort during painful procedures (6,7).

This study aimed to determine the effectiveness of facilitated tucking in pain reduction and duration of crying when venipuncture is being performed on preterm infants.

Methods and Materials

This was a semi-experimental study that the study population included all infants of 32 to 36 weeks of gestational age

hospitalized in the neonatal intensive care ward in Hashemi Nezhad Hospital, Mashhad-Iran, from December 2011 to February 2012.

Inclusion criteria included: 32 to 36 weeks of gestational age, weighing 1200-3200 g, body temperature between 36 to 37.2 ° C, lack of hypo or hyper glyceemic, non-use of tranquilizer or sedative and anticonvulsant drug during the last 24 hours, chronological age less than a week and have not been trying for venous sampling previous.

Eligible infants were selected by convenience sampling, one among the intervention group and controls were. Demographic information based on questionnaires and profile infants filled. The duration of the procedure before venous sampling, the baby was in a relatively quiet environment. At first the baby's temperature is controlled in a normal manner, without clothes and with only a diaper and wrapped in sheets and samples were transferred to a radiating warmer was for acceptance.

After the baby on heating, bed linen was open and set aside. Skin sensor was in the right upper quarter of the baby's liver and temperature was recorded. If the baby's temperature is out of range, 36 – 37.2 ° C, were excluded from the study.

All of the blood samples of infants under identical conditions (temperature, light, sound, size and type of needle) and by a skilled NICU nurses, who have at least five years of work in the infants and children, were taken. For all the babies of the same needle was used No. 21 and KBM mark. For control of hypoglycemia, the first drop of blood check by the devices glucometer (INFOPIA model). If not normally be excluded. For Accurate registration information in time of one chronometer was used.

In the infants were enrolled in the study, sampling period since the introduction of the

needle to withdraw it in seconds recorded and evaluated.

To evaluate the analgesic effects of facilitated tucking, researcher put your left hand on the head and with his right hand tucked lower limbs inside the belly of the baby.

Facilitated tucking before the needle starts and continued until calm baby or and continued until three minutes after sampling. To measure time cry baby in seconds, criterion for initiation and completion of cry, considered the first sound was audible to the paused that continue for at least five seconds. In control group, to prevent a change in position of baby from the lateral position to supine, a blanket roll back supine infant was placed. The roll not placed baby in the facilitated tucking, only prevent the child from the position change. According to routine hospital did not take any treatment for pain relief.

Credit of collection tools data were evaluated using content validity, to assess reliability, the reliability equivalence was used. For statistical investigation, descriptive statistics (frequency, percentage, and average \pm normal deviation) were used. For comparing quantitative findings between groups the statistical test of independent t-test was used. The study was done using SPSS16 statistical software and P-value<0.05 was significant.



Fig.1: In facilitated tucking, nurses holds the infant in the side-lying, flexed fetal-type position

Results

This study was performed on 70 infants that were 54.3% male and 45.7% female.

The mean gestational age of infants in study was 34.45 ± 1.22 weeks and weight of infants was between 1250-2950g. Intervention and control groups in terms of gender, birth order, first minute Appearance, Pulse, Grimace, Activity, Respiration (APGAR) scores, gestational age, birth weight and

chronological age, which could affect the results of this study were similar ($p < 0.005$).

Using an independent t-test revealed that the two groups are equal. The duration of crying after sampling, in the intervention and control groups, there were significant differences in the level of error 0.05 and this time in the control group was higher than the intervention group ($p\text{-value} = 0.024$).

Table 1: Comparison of The duration of crying after sampling in control and facilitated tucking groups

Comparison of the duration of crying after sampling	Group		P-value
	Intervention	Control	Independent t $t = -2.311$ $df = 68$ $p = 0.024$
	Mean \pm SD	Mean \pm SD	
	64.08 ± 57.44	97.14 ± 62.14	

Discussion

The findings of this study suggest that facilitated tucking is able to alleviate pain and duration of crying and nurses must be able to carry out facilitated tucking when needed. Pain management and relief is an important part of the infant developmental care that nurses to pay attention.

A similar study we don't found in search, but, in study of Olive et al. (2), the premature infant pain profile score for the treatment group was significantly lower (6.62 ± 2.598) than for the control group (8.52 ± 2.99 , respectively, $t = -2.202$, $p < 0.05$).

Johnston et al. (1) concluded that the effects of facilitated tucking have been examined in both preterm and very preterm infants undergoing commonly performed tissue breaking procedures in the NICU and have been shown to diminish the magnitude of physiological and behavioral pain response.

Corff et al. (8) neonates demonstrated a lower mean heart rate 6–10 minutes post-stick ($p < 0.04$), shorter mean crying time ($p < 0.001$), shorter mean sleep disruption time ($p < 0.001$), and fewer sleep-state changes ($p = 0.003$) after heel stick with facilitated tucking than without. Facilitated tucking is an effective comfort measure in attenuating premature neonates' psychological and behavioral responses to minor pain.

Axelin et al. (9) the highest Neonatal infant pain scale (NIPS) score was median 3 (range from 2 to 6) using facilitated tucking by parents and median 5 (range from 2 to 7) without tucking during suctioning ($p < 0.001$). The infants calmed down more quickly after facilitated tucking by parents (5 s vs. 17 s, $p = 0.024$).

Nineteen out of twenty parents preferred facilitated tucking during suctioning compared to control care.

Ward-Larson et al. (10) there was a significant difference between the Premature infant pain profile (PIPP) scores for tucking and non tucking positions ($p = 0.001$) and a non significant interaction with order ($p = 0.64$) as well as a non significant main effect for order ($p = 0.46$). In the regression analyses, all predictors taken together did not significantly predict PIPP scores in the tucked position ($p = 0.11$) or non tucked position ($p = 0.57$).

Conclusion

Since pain relief and management are one of key issues in current neonatal practice and considering the fact that despite increasing knowledge regarding neonatal pain, there is still a major gap between knowledge (“what we know”) and practice (“how we act”). In the hope that health team especially nurses, are doing any act painful for the baby, use a combination of non pharmacological pain reducer, have must in mind.

Conflict of interest: None

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