NON-PHARMACOLOGICAL METHODS FOR RELIEF OF DISCOMFORT AND PAIN IN NEWBORNS: A COLLECTIVE NURSING CONSTRUCTION[1]

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ABSTRACT: This is a convergent care study with the aim to build, together with the nursing staff, a proposal for care protocol based on non-pharmacological methods for discomfort and pain management in newborns admitted to a neonatal intensive care unit. The study was carried out in a neonatal intensive care unit of a university hospital with 16 nursing staff professionals. Data were collected in two stages: first, a reflective-educational process was performed and, afterwards, a participant observation during the different work shifts of the nursing staff. The care protocol proposal will enable the standardization of care strategies for pain management in newborns using non-pharmacological methods. Furthermore, it will contribute to provide better care in the neonatal unit, reducing pain and discomfort experienced during hospitalization, as well as resulting in fewer consequences and better quality of life for the newborns and their families.

DESCRIPTORS: Pain. Infant, Newborn. Neonatology. Nursing.

MÉTODOS NÃO FARMACOLÓGICOS PARA ALÍVIO DO DESCONFORTO E DA DOR NO RECÉM-NASCIDO: UMA CONSTRUÇÃO COLETIVA DA ENFERMAGEM

RESUMO: Pesquisa convergente-assistencial, que teve como objetivo construir, com a equipe de enfermagem, uma proposta de protocolo de cuidados, baseada nos métodos não farmacológicos, para o manejo do desconforto e da dor no recém-nascido internado em Unidade de Terapia Intensiva Neonatal. Foi realizada na unidade neonatal de um hospital Universitário, com 16 profissionais da equipe de enfermagem. A coleta de dados foi realizada em duas etapas: primeiramente, foi realizado um processo educativo-reflexivo e, em seguida, a observação participante nos diferentes turnos de trabalho da equipe de enfermagem. A proposta de protocolo de cuidados possibilitará a padronização das estratégias de cuidado no manejo da dor utilizando os métodos não farmacológicos no recém-nascido, além de contribuir para um melhor atendimento prestado na unidade neonatal, reduzindo a dor e o desconforto vivenciado durante a hospitalização, repercutindo também em menor número de sequelas e melhor qualidade de vida para o neonato e família.

DESCRITORES: Dor. Recém-nascido. Neonatologia. Enfermagem.

MÉTODOS NO FARMACOLÓGICOS PARA EL TRATAMIENTO DEL INCOMODIDAD Y DOLOR EN EL RECIÉN NACIDO: UNA CONSTRUCCIÓN COLECTIVA DE ENFERMERÍA

RESUMEN: Estudio convergente-asistencial que tuvo como objetivo construir con el plan de atención de enfermería basada en métodos no farmacológicos para el tratamiento del incomodidad y dolor en los recién nacidos ingresados en la unidad de cuidados intensivos neonatales. Se llevó a cabo en una unidad neonatal del hospital universitario, con 16 miembros de enfermería profesional. La recolección de datos se realizó en dos pasos: un proceso educativo reflexivo y la observación participante en diferentes turnos de trabajo. El plan de atención a la normalización de las estrategias de cuidado en el tratamiento del dolor utilizando métodos no farmacológicos en el recém-nascido y contribuye a mejorar la atención recibida en la unidad neonatal, la reducción del dolor y el estrés sufrido durante la hospitalización y que también refleja un menor número de secuelas y una mejor calidad de vida para el recién nacido y la familia.

DESCRIPTORES: Dolor. Recién nacido. Neonatología. Enfermería.

INTRODUCTION

In the 1960s, the first studies to assess whether newborns are capable of feeling pain were carried out, showing that myelination was not essential for the transmission of impulses through the sensory tracts. Today, it is known that the elements of the central nervous system, necessary for the transmission of painful stimuli to the cerebral cortex, are present in full-term and premature newborns, although the maturation and organization of this neurosensory system continue during postnatal life.[1]

Between the twentieth and twenty-fourth week of pregnancy, the fetus is able to perceive pain stimuli, because the nerve synapses are complete for pain perception, and the existing free nerve endings in the skin and other tissues have pain receptors. Thus, according to the American Academy of Pediatrics, newborns (NB) have components of the neuroanatomical and neuroendocrine systems sufficient to enable the transmission of pain stimuli.[2]

Given these findings, it is essential that health care professionals who work in Neonatal Intensive Care Units (NICU) learn to identify, assess and treat pain in newborns, seeking to reduce and/or avoid adverse effects in their development, as well contribute to faster recovery and quality care provided.[1] In the hospital setting, the NB is commonly exposed to many painful and uncomfortable procedures. Studies indicate that in routine care in the NICU, each seriously ill newborn is subjected to about 50-150 painful procedures per day.[1,3] The aim of the pain assessment should be to provide accurate data to determine what actions should be taken to prevent, relieve or stop it, and at the same time, to evaluate the effectiveness of these actions. Ideally, the evaluation and treatment of pain are interdependent, since one is practically useless without the other. Strategies for treatment of pain used without systematic review are not effective or suitable.[4]

It is known that the assessment of discomfort and pain is subjective and abstract. It is also necessary to have instruments that "decode" the language of pain, for which one-dimensional and multidimensional scales were developed. The one-dimensional instruments are designed only to quantify the severity or intensity of pain. Examples of such instruments are the verbal/numerical category scales and the visual-angico scale, which are frequently used in clinical settings due to their easy and quick application. On the other hand, the multidimensional instruments are used to evaluate and measure aspects of pain, based on different behavioral, physiological and contextual indicators, in isolation or together.[5] Because NB have a singular language and cannot express their pain verbally, multidimensional scales to assist health care professionals in pain assessment were developed. With pain stimuli, a series of physical and behavioral parameters change in NB. Among the physiological parameters of pain, the most broadly used for evaluating the phenomenon of pain in clinical practice are heart rate, respiratory rate, oxygen saturation and systolic blood pressure. The behavioral assessment of pain is based on the modification of certain behavioral expressions after a pain stimulus. The most studied behavioral responses to pain are motor response, facial expressions, crying, and sleep-wake patterns.[6] Examples of pain assessment scales in NB are the Facial Action Coding System (FACS), the Pain Assessment Scale (PAS) and the Premature Infant Pain Profile (PIPP).[4]

The nursing approach to discomfort and pain relief management in neonates with non-pharmacological methods emerges as a need to perceive the subtlety of the expression of pain in the baby, to perform better body reading, and more consensual and broadly humanized applicability of techniques explained in the NICU. The result is the prevention or minimization of future psychomotor, auditory and visual losses, as well as cognitive limitations.[7]

Long-term follow-up studies on newborns who required treatment in NICU for long periods have shown an increase of disabling consequences, chronic illnesses, neurological disorders, learning disabilities as well as language, vision, hearing and behavioral cognitive disorders, among others.[3,8] Some studies suggest that part of this morbidity may represent injuries in brain development resulting from stressful stimulation from the intensive care environment, which end up compromising the safety of care of the newborn.[8-9]

The everyday practice of health care professionals in crowded NICUs shows the importance of conducting this research, with the aim to build, together with the nursing staff, a care protocol proposal based on non-pharmacological methods to manage discomfort and pain in newborns admitted to NICU.

METHODOLOGY

This is an investigative, qualitative Convergent Care Research (CCR) characterized by the association of health care practice and the educational process, through which nurses can act as facilitators in the workplace together with the nursing staff. The CCR is a method focused on solving or minimizing problems of everyday practice that nurses experience, and on possible changes that the reflection process promotes in health care practices.[10]

The study location was the Neonatal Unit of São Thiago Polydoro Ernani University Hospital, at the Federal University of Santa Catarina (UH/FUSC). The study participants included four nurses, nine nursing technicians, one nursing assistant and two nursing undergraduate students. Most of the study participants had approximately eight or more years of work experience in the NICU. Inclusion criteria for the participants were participate in previously scheduled focus groups, without affecting the care dynamics. Professionals who were on vacation and sick leave were excluded from participating.

Data collection from the CCR was performed in two stages: first, four focus groups were carried out in October and November 2011, through the educational process guided by the tenets of Paulo Freire and Charles Maguerez's "arch of questioning." Freire's tenets and the problem-solving approach enabled professionals to pose the problem of the reality experienced by newborns exposed to pain in the NICU, reflect on their own actions, and build conscious thinking and acting through dialogue.[11] In the first focus group, the group reflected on the identification of discomfort and pain, seeking to know their perceptions of the pain experienced by newborns or their triggers. In the second focus group, the professionals indicated which non-pharmacological methods they were familiar with. Moreover, theorizing was done from the integrative review, developed by the researchers, in order to know the state of the art of managing discomfort and pain in newborns, and identifying the key scientific evidence related to the theme. In the third focus group, the professionals reflected on how and when to use non-pharmacological methods of pain relief. In the last focus group, an evaluation was done on what functions properly in the NICU where the professionals work, and what could be improved in terms of managing discomfort and pain in newborns, based on the professional experience of the group and recently-published scientific studies on the topic.

The second stage of data collection was through participant observation conducted by the researchers in February 2012, during the morning, afternoon and night shifts. Participant observation[13] is a technique performed through direct contact of the researchers with the phenomenon (pain relief management in newborns due to painful procedures or moments of discomfort), aiming to get as much information about the reality of the nursing staff in their professional context (NICU). At this time, the researchers sought to join the process of orientation and learning together with the nursing professionals, gleaning the theoretical aspects of management of discomfort and pain, as well as the discussions in the focus groups. The researchers were able to observe and validate the data collected in the focus groups, and to suggest possibilities for the application of non-pharmacological methods cited in the literature, as beneficial alternatives for the NBs.

The focus groups were audio recorded for data collection, as agreed by the participating professionals. As an additional method of data collection, a field journal was kept, in which the stories and conversations during the focus groups were fully recorded. The participant-observation stage was also recorded in the same journal.

Data analysis followed the steps of CCR, namely: collection, synthesis, theorization and application, resulting in the construction of the care protocol proposal, based on the data collected in the two phases of the research.

Ensuring ethical precepts, the research subjects agreed to participate voluntarily and were identified with alphabet letters referring to their professional category and a number (T1, N2, A1). The research was initiated only after the participating professionals signed a Free and Informed Consent Form, and the project was approved by the Human Research Ethics Committee of FUSC, under case n. 2241 FR 462628.

RESULTS AND DISCUSSION

The construction of the care protocol proposal aims to organize the actions of the nursing staff for the management of pain and discomfort in NBs through the use of non-pharmacological methods, and enables systematization of the care provided, while at the same time enables pain assessment, and guides the actions necessary for care, thereby minimizing the risk of consequences to the neonate.

During the process of collective construction of the protocol, the professionals from the nursing team had the opportunity to rethink the practice of care, and broaden their knowledge on the subject. Thus, the result of this work can be attributed to the convergence of theory and practice in an action-reflection-action movement.

Care protocol proposal for the management of discomfort and pain in NBs admitted to the NICU

This proposed protocol includes nursing care which should be used for the management of discomfort and pain in NBs admitted to the NICU, based on non-pharmacological management methods.

The material presents the primary invasive procedures to which hospitalized NBs are submitted, and points to the procedures that should be adopted by the professional nursing staff, with the purpose of preventing or minimizing the babies' pain and discomfort.

The first part of the protocol relates preliminary care actions for the management of discomfort and pain, which serve as general guides for care in the NICU. Description of this care is then provided.

Reduce environmental stimuli (noise and light)

The noise produced in the NICU reaches potentially dangerous levels for the fragile auditory system of NBs, especially preterm infants. High levels of noise can damage the cochlea, causing hearing loss to the NBs, as well as interfere with their rest and sleep, leading to fatigue, agitation and irritability, crying, increased intracranial pressure and predisposition to cranial bleeding in premature newborns.[13] Additionally, there is still the constant light in the NICU environment, which may delay the onset of endogenous circadian rhythms, leading to sleep deprivation or interference with normal sleep consolidation in pre-term infants, which take longer to adjust to the day/night cycle, and sleep more until they are 37 weeks old.[3] The strong light prevents the NBs from opening their eyes and inspecting the environment, and may cause endocrine changes. An abrupt increase of light is significantly associated with decreased oxygen saturation.[3]

Grouping care procedures and promoting sleep periods

Routine care should be grouped according to the tolerance of the baby, respecting sleep cycles in order to allow the greatest amount of deep sleep possible.[3] This does not mean doing all of the care at once, as the grouping of several procedures in a short amount of time can be more harmful to preterm infants. Humanized care to newborns with low weight, the Kangaroo method, advocates the use of day/night cycles, which may allow for improved synchronization of biological rhythms, resulting in increased hours of nighttime sleep, improved feeding efficiency and even body weight gain.[3]

Procedures administered to newborns should always be performed by two people

Professionals should work in pairs during procedures, taking care to leave one person providing ongoing support (containment) to the NB (may be either the father or mother), when duly instructed to be careful during care, and keeping all interactions within the newborns' tolerance levels.[3]

Care of newborns weighing until 1,000g should include containment during procedures and no glucose

The "containment facilitator" is the placement of still hands in an elastic manner, without excessive pressure, to contain the head, buttocks and limbs of the NB. This technique is considered an effective means to comfort preterm infants during procedures that cause pain or discomfort.[3]

Infants weighing 1,000g or less have no sucking reflex and do not coordinate swallowing and breathing. The reflexes of sucking and swallowing are present from the 17th week of pregnancy, and the coordination of sucking, swallowing and breathing is observed from the 32nd to 34th week of gestation.[3] Nevertheless, professional practice has shown that these babies do not initiate effective sucking abruptly, requiring a period of preparation and training so that sucking and swallowing movements are coordinated, with observation of clinical stability and individual maturity being required.[14]

Encourage and assist parents in the removal of the newborn from the incubator, avoiding disorganization

Before removing the NB from the incubator, the nursing staff can invite the parents to help

organize it. If they do not accept due to fear, they should gradually be inserted into care of the NB. The purpose of this practice is so that the NB is properly organized with help from the parents.[3]

Pain assessment should be performed daily, preferably in conjunction with checking vital signs

Pain should be considered the "fifth vital sign," and its assessment is recommended each time the newborn's vital signs are checked. Thus, the NB will be evaluated frequently and appropriate interventions for pain control can be adopted when necessary.[15]

When performing pain assessment, based on the appropriate scale and if the pain score is greater than 4, describe the intervention used and reassess after 30 minutes, always recording the result

The Pain Assessment Scale (PAS) was developed to facilitate the "decoding" of the signs emitted by the NB,[6] and to promote the most appropriate management during its hospitalization. During use of the PAS, based on assessment of physical and behavioral parameters, and if a score greater than 4 is obtained, the newborn should be considered to be in pain.

Nursing professionals must provide a written record of the care provided. Nursing records consist of written information relevant to NBs and their care. It is understood that the records are essential to the care process, because when written in a way that documents the reality, they enable ongoing communication, monitoring, evaluation, universal (re)planning and continuous care, in addition to monitoring the care provided.[16]

The second part of the care protocol proposal identifies the routine care procedures and causes of pain in NBs hospitalized in the NICU, and points out the treatment that should be adopted by professional nursing staff to prevent/reduce pain, as well as the justifications for such treatment.

For better visualization, the care protocol proposal is presented in the table below.

Table 1 - List of invasive procedures identified by the professional nursing staff, with the procedures to be adopted and their justifications to minimize discomfort and pain in newborns

Procedures	Treatment	Justification
Arterial/venous puncture (collection for exams, peripherally inserted central catheter, neonatal screening, peripheral puncture)	1. Provide 25% glucose (slow oral) or mother's milk drops, from two to three minutes before, during and after the procedure.	The 14th Cochrane Group review shows significant reduction of pain indicators when glucose was used as an analgesic in premature and full-term newborns subjected to blood collection.[4] Oral glucose is broadly used because it is believed to activate the taste buds on the back portion of the tongue, leading to the release of endogenous opioids.[2] Investigation of the efficacy of breast milk and its components for pain relief during and after the heel lancing procedure found that sucrose and Similac (special milk formula) reduced the signs of pain during and after the procedure.[17-18]
	2. Perform containment of the NB during the procedure.	The "facilitator containment" (placement of idle hands, in an elastic manner and without excessive pressure, to contain the head, buttocks and limbs) proved to be an effective means to comfort preterm infants during the heel lancing procedure.[3] Containment is a measure that favors self-organization and suggests an extension of the intrauterine environment, from the organization and postural sense of safety it provides. It is the promotion of an effective comfort which attenuates psychological and behavioral responses from neonates.[3,18]
	3. Promote skin-to-skin contact.	Skin-to-skin contact before, during and three minutes after the procedure calms babies, causing them to cry less during the procedure, and giving them a calmer facial expression during and after the procedure. This finding seems to be explained by the release of endogenous opioids, leading to an analgesic effect.[2]
	4. Stimulate nutritive sucking (when the mother is in the unit, the newborn can be placed on her breast) and/or stimulate non-nutritive sucking in infants who cannot suckle.	Non-nutritive sucking seems to be very useful in the neurological and emotional organization of the NB after the procedure.[2] One integrative review[19] identified the effectiveness of non-nutritive sucking in the reduction of pain experienced by newborns undergoing painful procedures. Administration of milk or breastfeeding should be used for the relief of pain in neonates undergoing painful procedures.[20] For acute pain caused by minor procedures (venipuncture, heel puncture, blood collection, aspiration, etc.), non-pharmacological strategies should be considered. These include: sucking at the breast, use of sweet oral solution (glucose or sucrose), non-nutritive sucking, skin-to-skin contact and multisensory stimulation,[21] the short-term efficacy and good tolerance of which are recognized.[19]

Procedures	Treatment	Justification
Continuous positive airway pressure (CPAP)	1. Instill 1 drop of 0.9% saline into the nostrils before placing the prongs, or lubricate prongs with petroleum jelly.	Inappropriate use of prongs can cause nasal injuries in newborns, ranging from simple hyperemia of the nasal mucosa, bleeding, crusting and necrosis, to total destruction of the anterior septum (columella) and nasal septum. It is important that health care professionals take into account the proper size of the prongs, according to weight and positioning. Well-positioned prongs do not deform the face of the neonate, and its bridge does not touch the nasal septum, nor allow the movement of this device inside the nostrils. Therefore, the size and inadequate fixation of the prongs are essential factors for non-beneficial effect and injuries, particularly smaller prongs, because when they do not fit perfectly into the nostrils of the NBs, they cause friction of the device inside the nostrils, in addition to encouraging escape of air. In order to provide relief and prevent injuries, adhesive nostril protectors are used, such as common surgical tape, hypoallergenic tapes and hydrocolloid plates, used above the nostrils, to avoid direct friction of the prongs with the columella and septum.[22]
	2. Use dual protection with thick hydrocolloid in a "T," or a "pig snout" shield.	
	3. Properly fix the trachea, preventing the prongs from "dancing."	
	4. Massage the nasal septum every eight hours.	
Fixing orogastric and nasogastric tubes.	1. Perform "kitten type" fixing by two people.	The "kitten type" attachment releases the orbicularis muscle of the lips, leaving it free and facilitating breast sucking. In a review of the gums of babies, the absence of dental alveolar cleft was observed.
	2. Always protect the skin with thin hydrocolloid.	One of the fundamental aspects of neonatal nursing care is preservation of the integrity of the newborns' skin.[23]
Aspiration of endotracheal tube and upper airways	1. Always perform the procedure with two people, even in a closed system.	Professionals should work together during procedures, taking care to leave one person providing ongoing support to the NB (either father or mother), being cautious during the care and keeping all interactions within the tolerance of the NB.[3]
	2. Check the measurement of the tube before aspiration.	The marking of the catheter should correspond to the length of the tracheal cannula, preventing the catheter tip from overcoming the limits of the cannula and traumatizing the mucous membrane. Perform bilateral lung auscultation to avoid selective aspiration. Check the position of the endotracheal tube. Check the setting, avoiding displacement of the tube and injury of the skin.[24]
	3. Maintain eye protection of the NB during aspiration.	To avoid falling of discharge into the newborns' eyes, and minimize the risk of bacterial conjunctivitis.
Lumbar puncture	1. Perform containment of NB during the procedure.	Containment is a measure that favors self-organization and suggests an extension of the intrauterine environment from its postural organization and the sense of safety. It is the promotion of an effective comfort which attenuates psychological and behavioral responses to pain in neonates.[3,18]

To finalize the care protocol proposal, the professionals stressed the importance of following all procedures, providing comfort for the NB, facilitating its reorganization, and resumption of the condition of well-being.

It is worth noting that the CCR and the problem-solving methodology allowed for movements of approach, distance and convergence with practice, so as to create spaces of overlap with care of hospitalized NBs.

CONCLUSION

The collective construction of a care protocol proposal for the management of discomfort and pain in NB, using non-pharmacological methods, allowed the nursing staff to share their ideas and experiences, spurring reflection and changes by the group on how to think and act in situations encountered in everyday care in the NICU.

The establishment of a care protocol proposal allows for standardization of care strategies in the management of discomfort and pain of NBs, using non-pharmacological methods. Additionally, this initiative contributes to provide better care in the neonatal unit, reducing the pain and discomfort experienced by neonates during hospitalization, as well as lowering the number of consequences, and improving the quality of life of NBs and their families.

The way the care protocol proposal was structured may contribute to its routine use by the nursing staff, guiding the necessary actions for care. Furthermore, it will give visibility to the role of nursing professionals in the prevention

and/or minimization of pain and discomfort of hospitalized NBs.

The situation experienced by the nursing staff is also expected to serve as a stimulus for new research, and for implementing similar protocols in other realities, in order to modify, enhance and equip neonatal nursing in the care of NBs admitted to NICU.

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