Journal of Nursing
Revista de Enfermagem
UFPE On Line
ISSN: 1981-8963

ORIGINAL ARTICLE

EVALUATION OF PAIN IN NEWBORNS HOSPITALIZED TO A NEONATAL INTENSIVE CARE UNIT

AVALIAÇÃO DA DOR DE RECÉM-NASCIDOS INTERNADOS EM UMA UNIDADE DE TERAPIA INTENSIVA NEONATAL

EVALUACIÓN DEL DOLOR DE RECIÉN NACIDOS HOSPITALIZADOS EN UNA UNIDAD DE CUIDADOS INTENSIVOS NEONATAL

Cibele Thomé da Cruz[1], Mariléia Stübe[2], Eliane Raquel Rieth Benetti[3], Joseila Sonego Gomes[4], Rosane Maria Kirchner[5], Eniva Miladi Fernandes Stumm[6]

ABSTRACT

Objective: describing the sociodemographic/clinical characteristics of newborns admitted to the Neonatal Intensive Care Unit and checking the score of pain in the first 24 hours of life. ***Method:*** this is a transversal research, descriptive, quantitative, with 34 newborns, developed from December 2012 to February 2013. Data were collected from sociodemographic/clinical forms and the Neonatal Infant Pain Scale, analyzed with descriptive statistics. The project was approved by the Research Ethics Committee, CAAE 10728012.3.0000.5350. ***Results:*** of the newborns, 64,7% are preterm boys, 52,9% small for gestational age, 52,9% with venous access via Inserted Peripheral Central Catheter, 64,7% in use of orogastric probe and 35,3% orogastric probe/vesical. There was verified the presence of severe pain on admission of the NB; within 24 hours of admission there was variation between no pain and severe pain. ***Conclusion:*** the assessment and management of pain qualify nursing care once they provide individualized interventions. ***Descriptors:*** Newborn; Premature; Pain Measurement; Intensive Care Units; Nursing Care.

RESUMO

***Objetivo*:** descrever as características sociodemográficas/clínicas de recém-nascidos internados em Unidade de Terapia Intensiva Neonatal e verificar o escore de dor nas primeiras 24 horas de vida. ***Método*:** trata-se de uma investigação transversal, descritiva, quantitativa, com 34 RNs, desenvolvida de dezembro/2012 a fevereiro/2013. Os dados foram coletados a partir de formulários sociodemográficos/clínicos e *Neonatal Infant Pain Scale*, analisados com estatística descritiva. O projeto foi aprovado pelo Comitê de Ética em Pesquisa, CAAE 10728012.3.0000.5350. ***Resultados*:** dos RNs, 64,7% são meninos pré-termos, 52,9% pequenos para idade gestacional, 52,9% com acesso venoso via Cateter Central de Inserção Periférica, 64,7% em uso de sonda orogástrica e 35,3% de sonda orogástrica/vesical. Foi verificada presença de dor forte na admissão do RN; nas 24 horas de internação houve variação entre ausência de dor e dor forte. **Conclusão:** a avaliação e manejo da dor qualificam a assistência de enfermagem por possibilitarem intervenções individualizadas.

***Descritores*:** Recém-Nascido; Prematuro; Medição da Dor; Unidades de Terapia Intensiva; Cuidados de Enfermagem.

RESUMEN

Objetivo: describir las características sociodemográficas/clínicas de los recién nacidos ingresados en la Unidad de Cuidados Intensivos Neonatales y comprobar la puntuación del dolor en las primeras 24 horas de vida. ***Método:*** se trata de una investigación transversal, descriptiva y cuantitativa, con 34 recién nacidos, desarrollada a partir de diciembre/2012 a febrero/2013. Los datos fueron obtenidos a partir de formas sociodemográficas/clínicas y Neonatal Infant Pain Scale, analizados con estadística descriptiva. El proyecto fue aprobado por el Comité de Ética en la Investigación, CAAE 10728012.3.0000.5350. ***Resultados:*** de los recién nacidos, el 64,7% son niños prematuros, 52,9% pequeños para la edad gestacional, el 52,9% con acceso venoso a través de catéter central de inserción periférica, el 64,7% en el uso de la sonda orogástrica y 35,3% orogástrica/vesical. Se verificó la presencia de dolor severo en la admisión del RN; dentro de las 24 horas de ingreso, hubo una variación entre ningún dolor y dolor severo. ***Conclusión:*** la evaluación y el manejo del dolor califican la atención de enfermería, una vez que proporcionan intervenciones individualizadas. ***Descriptores:*** Recién Nacido; Prematuro; Medición del Dolor; Unidades de Cuidados Intensivos; Cuidados de Enfermería.

[1]Nurse, Specialist in Nursing Intensive Care, Charity Hospital of Ijuí/RS. Ijuí (RS), Brazil. Email: cibelethome@bol.com.br; [2]Nurse, Specialist in Oncology, Charity Hospital of Ijuí/RS, Master's Student of the Postgraduate Program in Comprehensive Health Care/UNIJUÍ. Ijuí (RS), Brazil. Email: marileia06@yahoo.com.br; [3]Nurse, University Hospital of Santa Maria/RS, Master Teacher of Nursing, Department of Life Sciences of the Regional University of the Northwest of Rio Grande do Sul/UNIJUI, Doctoral Student of Nursing, Postgraduate Nursing Program, Federal University of Santa Maria/PPGEnf. Santa Maria (RS), Brazil. Ijuí (RS), Brazil. Email: elianeraquelr@yahoo.com.br; [4]Nurse, Master Teacher of Nursing, Department of Life Sciences, Regional University of the Northwest of Rio Grande do Sul/UNIJUI. Ijuí (RS), Brazil. Email: joseila.sonego@unijui.edu.br; [5]Mathematician, Professor of Electrical Engineering, Federal University of Santa Maria - Campus CESNORS. Ijuí (RS), Brazil. Email: rosanekirchner@gmail.com; [6]Nurse, Professor of Life Sciences, Department of Life Sciences/ Postgraduate Program in Integral Attention to Health, Regional University of the Northwest of the State of Rio Grande do Sul/UNIJUI. Ijuí (RS), Brazil. Email: eniva@unijui.edu.br

INTRODUCTION

Pain is a subjective experience that may be associated with actual or potential tissue damage, has sensory, affective, autonomic and behavioral aspects, described as the fifth vital sign.[1] Thus, it should be assessed along with the other signals from all patients who require nursing care team.

Regarding pain in neonates, the literature highlights a gap between scientific knowledge about pain, its consequences and the use of methods for evaluation and treatment.[2] It is known that in neonates the stimulus and the perception of pain occur before birth. The nerve endings appear in the perioral region in the seventh week of pregnancy, follow to the face, palms and plantar region in the 11th week, the trunk and proximal ends at the 15th week and around the 20th to 24th, the nerve synapses are complete to the perception of pain.[3] However, it is considered that, beyond scientific knowledge and the existence of protocols and routines, it is necessary to reflective practice to which are apparent changes in daily practice in the Neonatal Intensive Care Unit (NICU).

Whereas the World Health Organization shows that each year are born about 15 million premature babies in the world and that Brazil is in 10th place in absolute numbers, with 279.300 premature births per year[4], the number of newborns (NBs) who require admission to NICU has increased. This means that are expected of staff that assist them, skilled care and individualized, which include attention to pain, regarded as an important aspect in human assistance.

On average, premature infants in the NICU is subjected to about 130-234 manipulations within 24 hours and many of these are painful.[5] Acute painful stimuli in newborns trigger a stress response that includes physiological changes, accompanied by endocrine-metabolic reaction with release of adrenaline, noradrenaline and cortisol, which interfere in the homeostatic balance.[5] This imbalance can cause drop in oxygen saturation, increased heart and respiratory rate, stress and other long-term consequences such as impaired growth, development, decreased threshold pain and hyperalgesia.[5]

The use of pain assessment scales in neonates is considered a clinical tool of low cost and high impact on the identification of this symptom. Although most health professionals consider pain as the fifth vital sign and meet scales to assess pain in general they are not used in day-to-day.[5] Therefore, it is important to exploitation and awareness of team nursing for the occurrence of pain assessment with validated scales, to ensure excellence and safety in patient care, through actions for pain management.[5]

The study aimed to recognizing the experience of nurses, who care for children and infants, for the evaluation and intervention for pain relief, shows that pain relief and promoting comfort are essential interventions involving, in addition to scientific knowledge and technical skills, humanitarian and ethical issues in nursing.[6] Still, research on the perception of pain in children by the nursing team, points out that assess pain is a challenge, implies scientific knowledge combined with proper records and actions, not necessarily pharmacological measures, aimed at pain relief.[7] Non-pharmacological methods such as touch, massage therapy, skin to skin contact, kangaroo position and breastfeeding are effective in reducing painful responses and physiological stability of NBs.[8]

This study is justified by the fact that, from the exploitation and awareness of the nursing team for assessment and recording of pain in neonates, it is expected to contributing to the implementation of the use of pain scale, both at the time of sign check as vital before and after procedures.

From these considerations we aim to:

- Describing the sociodemographic/clinical characteristics of newborns admitted to the Neonatal Intensive Care Unit;
- Checking the pain scores in the first 24 hours of life.

METHOD

A cross-sectional study, descriptive of a quantitative approach, conducted in a NICU of a general hospital size IV, of the Northwest Region of Rio Grande do Sul/Brazil.

The study included all neonates (n = 34) who were hospitalized in this unit from December 2012 to February 2013. Data were collected using a questionnaire with sociodemographic and clinical variables obtained from patient medical records. It also used the Neonatal Infant Pain Scale (NIPS), developed by Lawrence et al in 1993 to assess pain. The same evaluates the pain of the child, based on the following behavioral and physiological parameters: facial expression, crying, breathing, arms, legs and alert state.[9] For pain score, the authors propose: 0 - no pain, 1 and 2 – light pain, 3-5 - moderate pain and 6-7 - severe pain, as described in the table below:

Parameter	0 point	1 point	2 points
Facial expression	Relaxed	Contracted	-
Cry	Absent	"Grumblings"	Vigorous
Respiration	Relaxed	Unlike basal	-
Arms	Relaxed	Flexion or extension	-
Legs	Relaxed	Flexion or extension	-
State of alert	Sleeping or calm	Uncomfortable	-

Figure 1. Behavioral and Physiological Parameters for Classification of Pain.
Source: Neonatal Infant Pain Scale (NIPS)

There have been complied the ethical precepts of the Resolution 196/96 of the National Health Council[10], a project approved by the Research Ethics Committee, Opinion Embodied No. 177 690 of 19th December, 2012, CAAE 10728012.3.0000.5350. After approval, team instrumentation was performed on pain assessment and application of NIPS as the fifth vital sign. In the data collection period, the NIPS were applied by the researcher and nursing staff, concurrently with the measurement of vital signs every two hours.

Data analysis was performed using descriptive statistics, the average calculation and standard deviation of the variables studied, using the Statistical Package for Social Sciences (SPSS) 18.0, and the results presented in tables.

RESULTS

In table 1 are presented the sociodemographic characteristics and clinics of newborns.

Table 1. Sociodemographic and clinical characteristics of newborns admitted to the Neonatal Intensive Care Unit. Rio Grande do Sul, RS, Brazil, 2013.

Characteristics	n	%
Gender		
Male	22	64,7
Female	12	35,3
Gestational age		
Pre-term	24	70,6
To term	10	29,4
Birth		
Vaginal birth	12	35,3
Cesarean birth	19	55,9
Non-informed	3	8,8
Weight of the NB		
Small for the gestational	18	52,9
age	12	35,3
Appropriate for gestational	4	11,8
age		
Large for gestational age		
Apgar 1		
Greater than or equal to 8	27	79,4
(5th minute)	6	17,6
Smaller than 8 (5th minute)		

Source: Data of the research.

In table 2 there are explained the diagnosis of newborns to be admitted to the NICU. It appears that most newborns have more than one diagnosis, and that respiratory dysfunction is the one with the highest percentage, followed by prematurity and low birth weight.

Table 2. Diagnostics of the NBs at the time of hospitalization in Neonatal Intensive Care Unit. Rio Grande do Sul, RS, Brazil, 2013.

Diagnosis	n	%
Respiratory dysfunction	25	73,5
Prematurity	21	61,8
Low birthweight	5	14,7
Meconium aspiration	3	8,8
Gestational Diabetes mellitus	3	8,8
Neonatal sepsis	2	5,9
Perinatal Anoxia	2	5,9
Respiratory insufficiency	2	5,9
Twin Pregnancy	2	5,9
Hypotonia	1	2,9
Convulsive crisis	1	2,9
Hypoglycemia	1	2,9
Stock route	1	2,9
Bronchopneumonia	1	2,9
Transient tachypnea	1	2,9
Hyaline membrane disease	1	2,9
Large for gestational age	1	2,9
Hydrocephalus	1	2,9
Dehydration	1	2,9

Sequentially in table 3 presents the technical procedures performed in newborns at the time of admission to the NICU as well as medications administered. It is noteworthy, that was held more than one procedure in each NBs and receiving multiple medications. Most of them were punctured peripheral venous access, and more than half was inserted the Central Catheter Peripheral (PICC), and the peripheral venous access.

Table 3. Technical procedures on the admission of NBs in the Neonatal Intensive Care Unit. Rio Grande do Sul, RS, Brazil, 2013.

Procedures	n	%
Venous access		
Catheter of PICC	18	52,9
Peripheral venous access	26	76,5
Other	2	5,9
Oxygenation		
Mechanical ventilation	16	47,1
Canopy of Oxygen	16	47,1
Ambient air	2	5,9
Sounding		
Orogastric sounding	22	64,7
Orogastric and vesical sounding	12	35,3
Antibiotic management		
Yes	22	64,7
No	12	35,3
Use of vasoactive drugs		
Yes	14	41,2
No	20	58,8
Use of Sedative drugs		
Yes	12	35,3
No	22	64,7

Table 4 shows the measurement of pain in the first 24 hours after admission to the NICU.

Table 4. Measurement of pain in the early life of 24 hours of NBs admitted to Intensive Neonatal Care Unit l. Rio Grande do Sul, RS, Brazil, 2013.

	Classification of pain				
Verification	None n (%)	Weak n (%)	Moderate n (%)	Strong n (%)	Average ± SD*
First	8(23,5)	2(5,9)	11(32,4)	13(38,2)	1,85±1,18
Second	23 (67,6)	3(8,8)	5(14,7)	3(8,8)	1±1,04
Third	22 (64,7)	7(20,6)	4(11,8)	1(2,9)	0,52±1
Fourth	20(58,8)	5(14,7)	7(20,6)	2(5,9)	1±1
Fifth	20(58,8)	4(11,8)	8(23,5)	2(5,9)	1±1,01
Sixth	26(76,5)	1(2,9)	6(17,6)	1(2,9)	0,47±1
Seventh	24(70,6)	2(5,9)	4(11,8)	4(11,8)	1±1,09
Eighth	24(70,6)	3(8,8)	5(14,7)	2(5,9)	1±1
Ninth	27(79,4)	1(2,9)	3(8,8)	3(8,8)	0,47±1
Tenth	22(64,7)	4(11,8)	7(20,6)	1(2,9)	1±1
Eleventh	25(73,5)	2(5,9)	5(14,7)	2(5,9)	1±1
Twelfth	22(64,7)	5(14,7)	4(11,8)	3(8,8)	1±1,01

* Value of pain intensity scores on descriptive analysis: 0=none; 1=weak, 2=moderate, 3=strong.

It was found that pain was strong in the first check, that is, during the hospitalization of infants in the NICU, with highest average. This was also verified by considering the percentage of newborns who had severe pain (38,2%) followed by moderate pain (32,4%) in the first assessment.

DISCUSSION

Among NBs 64,7% were male, 70,6% were born preterm (gestational age < 37 weeks old) and 52,9% small for gestational age. A similar result was found in a study conducted in a NICU of a teaching hospital in Fortaleza/Ceará, in which the authors identified 50% of male NBs, 80,8% small for gestational age and 92,3% preterm.[11]

It is noteworthy that the low weight is a factor that influences mortality and clinical complications during hospitalization of infants in the NICU, which is exposed to a number of painful procedures daily. In this context, the stress of handling for procedures increases the metabolic demand and the need for oxygen, with physiological and behavioral responses that can impact on the neurobehavioral development of NB.[11]

The increase in mortality, neurodevelopmental sequelae and abnormal front somatization to pain in other stages of life can be considered negative consequences of repeated painful stimuli in the neonatal period.[12] Thus, the reduction in exposure to nociceptive or stressful events can lead to better results, both clinical and related neurological development of the newborn.

Therefore, in recent years, major advances have occurred in relation to the assessment of pain with the validation of objective criteria that can be used in different locations. The standardization of pain as the fifth vital sign, by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) is considered one of these advancements, as scores as priorities evaluation (location and intensity) based on behavioral scales and physiological parameters, intervention and pain revaluation in the hospital qualification process.[5]

Whereas the infant is unable to inform the site of pain and its intensity, the nursing staff is of paramount importance because providing direct care to newborns continuously. However, some factors, such as: gestational age, gender, race, physical appearance, presence of tissue damage and severity of the diagnosis can change the inference of the presence and magnitude of pain by the observer.[12]

With regard to the technical procedures that newborns were subjected to admission to the NICU, it was found that in all of them was punched venous access, either a peripheral or central catheter (PICC). This result is explained by the need for venous infusions, both of vasoactive drugs, sedative/analgesic and antibiotics, as Total Parenteral Nutrition (TPN). In this sense, among the essential procedures in the care of newborns in a NICU invasive stand out and, including venipuncture, considered one of the most difficult practices to perform in neonates and one of the most played by the nursing team.[13]

In addition to the venipuncture procedures, apparently less painful, deserve attention by professionals working in the NICU and justify the need for the use of scales to assess pain. In the meantime, a study that aimed to identify whether nurses recognize the completion of the technical procedure of nasal CPAP installation NB as pain triggering of the 11 nurses interviewed, only two (18%) signaled the nasal CPAP as painful.[14] This result we infer that the pain and its management in NB receive little attention in clinical practice and reflect that, no matter how small the technical procedure should be offered very carefully, especially when it

comes to newborns, who need a clinical perspective critical for the interpretation of their pain.

As regards pain during insertion of the PICC, the study dimensioned pain during insertion of the catheter, comparing the time of venipuncture with the same progression, and pain ranged from moderate to severe in neonates subjected to puncture.[15] Thus, given the impossibility of eliminating painful invasive procedures, being necessary to risk newborns, it is important preventing the negative effects of the procedure, in order to protect them. Search strategies to control pain in neonates should be a goal for professionals, in particular non-pharmacological strategies, in order to relieve pain caused by procedures and avoiding aggravate the clinical status of the NB.[15]

Regarding the oxygenation of those surveyed NBs, identical percentage was in mechanical ventilation and oxygen hood. It is considered that the first condition requires tracheal aspiration, an invasive and painful procedure. In a study with ten premature newborns, submitted to the evaluation of pain during aspiration, found that 95% showed behavioral and physiological changes, indicative of pain .[16]

All newborns underwent Orogastric survey and 35,3% to Orogastric and urinary catheterization. In this context, research in which also used the NIPS to assess newborns pain before, during and after Orogastric survey procedures and venipuncture, concluded that newborns had severe pain during the completion of the procedures .[17] Given these results, we highlight the need for professionals to be judicious when assessing the indication of these and other procedures, and to use strategies to minimize or alleviate pain.

The feeling of pain and stress mean suffering and discomfort for newborns and pain treatment consists of non-pharmacological and pharmacological measures and the use of specific protocols in the NICU. The care protocols for NBs should incorporate the principle of minimizing the painful interventions as much as possible and strategies should include pain assessment routinely decrease in the number of procedures performed at the bedside and use of effective measures proven scientifically .[18]

In measuring the pain of newborns in the first 24 hours of admission to the NICU, measured concurrently with other vital signs, it appears that it is strong in the first check, on admission of the NB to the NICU. Joins this result to the fact that this is where the newborns undergo several invasive procedures that are proven to cause pain. In this sense, it is fundamental minimizing the aggression suffered by neonates during hospitalization in the NICU and necessary to use assessment instruments and pain treatment protocols.

When identifying the pain, the nursing staff cannot perform pharmacological approaches that prevent clutter and unnecessary NB agitation. Also, it is important to worry about the sensitivity of the NB to pain, the physical and psychological consequences that they may suffer, in addition to growth and development commitment when excessively undergoing painful procedures .[19]

In order to promoting the management of discomfort and pain of the NB, a survey of nursing a Neonatology Unit professionals, proposed the construction of a care protocol in order to organizing the nursing team actions related to pain management and discomfort of the newborn (NB), using non-pharmacological methods.[20]

In the first part of the protocol, the authors cite care in the management of discomfort and pain, such as: reducing environmental stimuli (noise and light); group care and promote sleep periods; care of newborns with 1.000g weight should include the containment during procedures and not the supply of glucose; encourage and assist parents in removing the baby from the incubator and/or heated crib, avoiding your clutter.[20] In the second part, routine procedures and pain-causing in newborns hospitalized in NICU are identified and pointed out the behaviors that should be adopted by professional nursing staff, for the prevention/reduction of pain as well as the reasons for taking such conduct.[20]

From these results, it is concluded that a protocol of care allows for standardization of strategies for managing the discomfort and pain of the newborn, which contributes to quality care, reduces pain and discomfort experienced by neonates during hospitalization in a NICU and also reflected in fewer sequelae and improved quality of life for the newborn and its family. It is recommended that prior to procedures that can lead to acute pain, the NB is in behavioral alertness inactive, is positioned comfortably and organized; and, during the course of painful procedures, professionals should assess the newborn's response to non-pharmacological measure the need for other interventions.[8]

In this context, an action research conducted in order to know the perception of a NICU team on the evaluation and

management pain before and after an educational intervention, showed that the perception of professionals about the management and evaluation of pain was statistically significant between the two phases of the research.[21] The professionals involved in the educational intervention realized changes in pain management and related the strategies defined and implemented by the Operating Group.

This result highlights the importance of staff training for evaluation and proper management of pain. In addition, to score-need for a specific protocol from certain actions within a NICU, as the minimum manipulation, respect for the rule of sleep/wake NB, performing elective procedures during the day, among others, which, besides helping in reducing the painful sensation, maintaining the physical and mental integrity of the NB.

Based on the findings of the research, combined with the positions of different authors, it notes the importance of pain evaluation of neonates in intensive care and planning action for pain management, such as strategies for individualizing and humanizing assistance given to newborns in the NICU.

CONCLUSION

It is concluded that the assessment and monitoring of the neonate's pain qualify nursing care, since the notes her team can make use of non-pharmacological and pharmacological strategies for relief, enabling well-being and comfort to the NB. Therefore, it is believed that the action of a minimal handling protocol NB in the NICU may favor the practice of health staff and emphasize the holistic and individualized care, by raising awareness among professionals to ensure effective care for the well-promotion being of infants.

Considering the fact of having the agreement of the nurses who work in a NICU, combined with opportunity to prepare the nursing staff of the respective unit for the application of NIPS scale, it was important making possible to conduct this research successfully. The research enabled the implementation of this scale for the assessment of pain as the fifth vital sign, as well as the adoption of a pain management protocol in the unit in which it was held. From this study, assess pain along with other vital signs of the newborn is routine in this NICU, in order to provide individualized and humanized care to this significant percentage of the population.

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Submission: 2014/01/14
Accepted: 2015/01/24
Publishing: 2015/07/01

Corresponding Address

Eniva Miladi Fernandes Stumm
Rua Vinte de Setembro, 902
Bairro Centro
CEP 98700-000 –- Ijuí (RS),-Brazil