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Factors Associated with Skin Injury in Hospitalized Newborns in Intensive Care Units

Fatores relacionados a lesão de pele em recém-nascidos hospitalizados em Unidade de Terapia Intensiva

Factores relacionados con lesiones cutáneas en recién nacidos hospitalizados en una Unidad de Cuidados Intensivos

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ABSTRACT

Objective: to analyze types of skin injuries affecting newborns hospitalized in a neonatal intensive care unit and to discuss factors associated with these injuries. **Method:** cross-sectional study conducted in a neonatal intensive care unit in Paraná, Brazil, over 12 months. Data obtained from electronic medical records and by injuries monitoring, following the Newborn Skin Condition Scale, analyzed using Chi-square tests, Analysis of Variance (ANOVA), and Tukey's test. **Results:** the incidence of skin injuries was 25.40%; the most common were perianal dermatitis (39.29%), pressure injuries, and surgical wounds (both 16.96%). These injuries were more prevalent in male newborns with a birth weight of over 2,500 grams, gestational age between 32-35 weeks and over 37 weeks, Apgar score between 7-10, and hospitalization of 30 days. Pressure injuries were frequent in premature newborns, with a mean weight of 1,517.89 grams. **Conclusion:** perianal dermatitis was the most commonly identified injury, associated with factors such as male sex, birth weight over 2,501 grams, Apgar score above 7, and extended hospitalization.

Descriptors: Neonatal Nursing; Infant, Newborn; Intensive Care Units, Neonatal; Skin; Wounds and Injuries.

RESUMO

Objetivo: analisar os tipos de lesões de pele que acometem recém-nascidos hospitalizados em unidade de terapia intensiva neonatal e discutir os fatores relacionados às lesões de pele. **Método:** estudo transversal, realizado em unidade de terapia intensiva neonatal do Paraná, durante 12 meses. Dados obtidos em prontuários eletrônicos e acompanhamento das lesões, segundo a Escala de Condições de Pele do Recém-Nascido, analisados por Teste Qui-quadrado, Análise de Variância e Teste de Tukey. **Resultados:** a incidência de lesões de pele foi 25,40%, principalmente, dermatite perianal (39,29%), lesões por pressão e feridas operatórias (ambas 16,96%), entre recém-nascidos do sexo masculino, com peso ao nascer >2.500g, idade gestacional entre 32-35 e >37 semanas, Apgar entre 7-10 e 30 dias de hospitalização. Lesão por pressão foi frequente em prematuros, com peso médio 1.517,89g. **Conclusão:** dermatite perianal foi a lesão mais identificada, cujos fatores se relacionaram ao sexo masculino, peso >2.501g, Apgar >7 e longo período de hospitalização.

Descritores: Enfermagem Neonatal; Recém-nascido; Unidade de Terapia Intensiva Neonatal; Pele; Ferimentos e Lesões.

RESUMEN

Objetivo: analizar los tipos de lesiones cutáneas que afectan los recién nacidos hospitalizados en unidad de cuidados intensivos neonatales y discutir los factores relacionados con las lesiones cutáneas. **Método:** estudio transversal, realizado en unidad de cuidados intensivos neonatales de Paraná, durante 12 meses. Datos obtenidos de las historias clínicas electrónicas y del seguimiento de las lesiones, según la Escala de Valoración de la Piel del Recién Nacido, analizados mediante la Prueba de Chi-cuadrado, Análisis de Varianza y Prueba de Tukey. **Resultados:** la incidencia de lesiones cutáneas fue del 25,40%, principalmente dermatitis perianal (39,29%), lesiones por presión y heridas quirúrgicas (ambas 16,96%), en recién nacidos varones, con peso al nacer >2.500g, edad gestacional 32-35 y >37 semanas, Apgar 7-10 y 30 días de hospitalización. Las lesiones por presión fueron comunes en los bebés prematuros, con un peso promedio de 1.517,89g. **Conclusión:** la dermatitis perianal fue la lesión más identificada, cuyos factores se relacionaron con sexo masculino, peso >2.501g, Apgar >7 y largo tiempo de internación.

Descriptores: Enfermería Neonatal; Recién Nacido; Unidades de Cuidados Intensivos Neonatal; Piel; Heridas y Lesiones.

INTRODUCTION

Premature and low-birth-weight newborns require intensive hospital care to meet their survival needs. A variety of interventions, both invasive and non-invasive, are necessary in this context. However, while these interventions are essential, they can lead to adverse complications, with skin injuries being a significant concern often associated with early neonatal care[1].

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The primary causes of skin injuries in premature newborns in Neonatal Intensive Care Units (NICUs) include prolonged positioning in incubators or cribs, friction with medical devices, excessive handling during procedures[2], and the presence of other clinical conditions such as neonatal jaundice or respiratory problems[3]. These factors, combined with the delicate skin of premature infants, can predispose them to the development of skin injuries, ranging from simple abrasions to severe wounds[4]. Skin injuries can increase the risk of infections, prolong hospital stays, interfere with feeding and proper development, and potentially cause permanent scarring[5].

A study involving 32 NICUs in Australia and New Zealand found that 30% of skin injuries were related to medical devices or adhesives, 46% to abrasions/friction, 55% to perineal skin breakdown, 47% to pressure injuries (PI), and 60% to perianal dermatitis[6]. In a Brazilian study, 48% of skin injuries were related to the use of medical equipment, with peripheral devices and nasal septum injuries being the most frequent[7]. Recommended preventive practices for skin injuries include slow removal of adhesives with moist gauze, regular inspection of skin in contact with devices, rotation of monitoring sites, frequent changes in body position, and reduction in the use of potentially toxic substances for the skin[5,6,8].

To assess the skin condition of newborns, various scales are used, with the Newborn Skin Condition Scale (NSCS) being an important tool recommended in the current literature[1,4]. Additionally, to evaluate the risk of pressure injuries (PI) in hospitalized patients, there is the Braden QD Scale[1,9], which is used for newborns from 21 days of life onward. Both instruments are crucial for monitoring the skin of newborns as they can identify the risk of developing severe injuries at an early stage[9].

It is important to note that skin injuries cause discomfort and pain, which can lead to stress and adversely affect the newborn in sensory, affective, autonomic, and behavioral aspects, as well as interfere with brain development. Moreover, considering that pain is regarded as the fifth vital sign, healthcare professionals must evaluate it throughout the care provided[10]. There are over 40 instruments for assessing pain in newborns; however, implementing them in practice is challenging. For example, a study conducted in Warsaw, which analyzed the use of two pain scales, found that both the Neonatal Infant Pain Scale (NIPS) and the Comfort-Behavior Scale were considered moderately good, but training is required to improve the competencies of the NICU nursing team in using these pain scales. Thus, it was concluded that pain is still under-assessed and undertreated[11].

Therefore, it is essential for healthcare professionals, particularly the nursing team, including assistants, technicians, and nurses, to be aware of the importance of identifying factors that trigger skin injuries in newborns, as well as the practices that help maintain skin integrity, given the need to minimize short- and long-term complications. Given the above, the following guiding question arises: what factors are associated with the occurrence of skin injuries in hospitalized newborns? To address this, the present study aimed to: analyze the types of skin injuries affecting newborns hospitalized in NICUs and discuss the factors related to these skin injuries.

METHOD

This was a cross-sectional, prospective, and quantitative study conducted in the NICU of a university hospital in Western Paraná, Brazil. The NICU has ten beds dedicated to the care of critically ill newborns from the obstetric center, the neonatal intermediate care unit, and emergency care units in the city and region (10th Health Region, which covers 25 municipalities)[12]. The hospital is considered a regional reference for high-complexity neonatal care, receiving cases from across the region, which provides a diverse and representative sample of newborns with different clinical profiles.

The inclusion criteria were: newborns hospitalized in the NICU, regardless of gestational age and reason for admission, provided they presented at some point with a score greater than 4 on the NSCS. The exclusion criteria included: newborns transferred to the NICU from another institution before the completion of skin injury treatment, as this would prevent monitoring the progression of the injury, and those who remained hospitalized beyond the data collection period. The final sample comprised 74 medical records of newborns, selected through non-probabilistic convenience sampling, with non-random selection of participants.

Data collection took place over one year, beginning in September 2022 and ending in August 2023, using a structured instrument developed by a researcher specializing in neonatal nursing and a nursing resident, later reviewed by two nurses from the neonatal unit. After five pilot tests, it was determined that no adjustments were necessary, and the instrument was incorporated into the study.

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The dependent variables were the types of identified skin injuries, while the independent variables included in the instrument were organized into two categories: birth data (sex, birth weight, gestational age, and Apgar scores at the 1st and 5th minutes) and clinical characteristics and interventions (use of antibiotics, hemoglobin tests, total parenteral nutrition, phototherapy, length of hospitalization, NIPS score, NSCS score, and healing time).

Data were organized in Microsoft Excel® spreadsheets and analyzed using XLStat2014® software. Initially, absolute and relative frequencies of the variables of interest were calculated. To investigate possible associations between categorical variables, a Chi-square test was performed with a significance level of 5%. Additionally, to analyze continuous variables and compare means between different groups, Tukey's test was used following an Analysis of Variance (ANOVA), also with a significance level of 5%.

The study was approved by the Research Ethics Committee of the educational institution (Approval No. 5.656.829/2022) and complied with Resolution 466/2012 of the Brazilian National Health Council, which regulates research involving human subjects. After explaining the research objectives, consent was obtained from the parents or guardians of the newborns. All participants signed the Informed Consent Form, provided in duplicate. The anonymity of the information was ensured through the coding of the medical records of the participating newborns.

RESULTS

The results show that out of the 291 newborns admitted during the analysis period, 74 (25.4%) developed skin injuries, with 59.4% presenting more than one injury. The average length of hospitalization for these cases was 37 days. A total of 112 skin injuries were identified, categorized as follows: 44 (39.29%) were dermatitis; 19 (16.96%) were pressure injuries (PI); 19 (16.96%) were surgical wounds (SW); and 30 (26.79%) were other types of injuries, such as blisters, infiltration, abrasions, ulcerations, among others.

Regarding the locations of the skin injuries in the newborns: 35 (31.25%) were located in the perianal region; 13 (11.61%) on the head; 12 (10.71%) on the nasal septum; 11 (9.82%) on the abdomen; 8 (7.14%) on the chest; 7 (6.25%) on the upper limbs; 7 (6.25%) on the lower limbs; and 19 (16.96%) in other regions of the body.

Table 1 presents the birth characteristics of the newborns affected by skin injuries.

Table 1: Profile of Newborns According to Birth Characteristics (n=74) Cascavel, PR, Brazil, 2023.

Characteristics	Dermatitis	f(%)	FO*	f(%(	SW**	f(%)	Others	f(%)
Gender								
Female	19	43.2	6	28.6	12	63.2	11	36.7
Male	25	56.8	15	71.4	7	36.8	19	63.3
p-value	0.4510		0.8909		0.3588		0.2012	
Birth weight (grams)								
<1000	7	15.9	0	0.0	6	31.6	5	16.7
>1,001 and <1,500	5	11.4	4	19.0	5	26.3	12	40.0
>1,501 and <2,500	14	31.8	7	33.3	6	31.6	8	26.7
>2.501	18	40.9	10	47.6	2	10.5	5	16.7
p-value	0.0186		0.2765		***		0.2214	
Gestational age (weeks)								
≤28	8	18.2	0	0.0	5	26.3	13	43.3
≥29 and <32	2	4.5	0	0.0	7	36.8	1	3.3
≥32 and <35	13	29.5	6	28.6	3	15.8	9	30.0
≥35 and <37	8	18.2	8	38.1	2	10.5	4	13.3
≥37	13	29.5	7	33.3	2	10.5	3	10.0
p-value	0.0516		***		***		0.0030	
Apgar 1st minute								
0-3	14	31.8	6	28.6	7	36.8	16	53.3
4-6	15	34.1	0	0.0	5	26.3	6	20.0
7-10	15	34.1	15	71.4	7	36.8	8	26.7
p-value	0.9775		0.0809		0.8102		0.0608	
Apgar 5th minute								
0-3	1	2.3	4	19.0	1	5.3	3	10.0
4-6	8	18.2	0	0.0	5	26.3	8	26.7
7-10	35	79.5	17	81.0	13	68.4	19	63.3
p-value	0.0001		0.001		0.0028		0.0012	

Note: *Surgical Wound (SW), **Pressure Injury (PI), ***Not possible to calculate.

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The majority of newborns who presented with dermatitis and/or SW were male (respectively, n=25; 56.8% and n=15; 71.4%). Additionally, 19 (63.3%) male newborns presented with other types of injuries, with no statistically significant difference found between the sex of the newborn and the type of injury. Most newborns with a birth weight above 2,501 grams developed perianal dermatitis (n=18; 40.9%) or SW (n=10; 47.5%), with a statistically significant difference (p=0.02) for those presenting with dermatitis.

Newborns with a gestational age of 28 weeks or less exhibited other types of injuries (n=13; 43.3%), with statistical significance (p=0.003) compared to dermatitis, SW, and PI. Among newborns with a gestational age between 29 and 32 weeks, PIs were the most prevalent (n=7; 36.8%). For those between 35 and 37 weeks of gestation, most presented with SW (n=8; 38.1%); however, due to the low number of events, a statistical test could not be performed. For newborns with dermatitis, the predominant gestational ages were between 32 to 35 weeks (n=13; 29.5%) and 37 weeks or greater (n=13; 29.5%), but without statistical significance.

In relation to the Apgar score, newborns with a score above 7 in the fifth minute presented some type of injury, all of which showed statistical significance. In the first minute, newborns with dermatitis had similar scores, ranging from 4 to 6 and 7 to 10 (n=15; 34.1%). For those with SW, the score was between 7 and 10 (n=15; 71.4%). Newborns with PI had similar scores, from 0 to 3 and 7 to 10 (n=7; 36.8%). Finally, those with other types of injuries predominantly had a score of 0 to 3 (n=16; 53.3%). The Apgar scores at the first minute did not show statistical significance.

Table 2 presents the clinical characteristics of newborns who developed skin injuries.

Table 2: Distribution of newborns with skin injuries by yype of injury, clinical characteristics, and interventions during hospitalization (n=74) Cascavel, PR, Brazil. 2023.

Characteristics	Dermatitis	f(%)	FO*	f(%)	SW**	f(%)	Others	f(%)
Antibiotics								
Yes	4	9.1	21	100.0	2	10.5	30	100.0
No	40	90.9	0	0.0	17	89.5	0	0.0
p-value	0.0013		0.0001		0.0013		0.001	
Hemoglobin								
< 11g/dl	8	18.2	8	38.1	4	21.1	8	26.7
≥ 11g/dl	36	81.8	13	61.9	15	78.9	22	73.3
p-value	0.0001		0.3827		0.0218		0.0176	
Total Parenteral Nutrition								
Yes	34	77.3	6	28.6	8	42.1	14	46.7
No	10	22.7	15	71.4	11	57.9	16	53.3
p-value	0.0005		0.0495		0.6464		0.8551	
Phototerapy								
Yes	20	45.5	16	76.2	3	15.8	10	33.3
No	24	54.5	5	23.8	16	84.2	20	66.7
p-value	0.6511		0.0291		0.0059		0.1003	
Hospitalization time								
Up to 7 days	0	0.0	0	0.0	0	0.0	5	16.7
8-14 days	10	22.7	2	9.5	0	0.0	4	13.3
15-30 days	14	31.8	3	14.3	4	21.1	5	16.7
More than 30 days	20	45.5	16	76.2	15	78.9	16	53.3
p-value	0.0002		0.0001		*		0.0048	
NIPS* **								
<4	38	86.4	19	90.5	15	78.9	22	73.3
≥4	6	13.6	2	9.5	4	21.1	8	26.7
p-value	0.0001		0.0005		0.0218		0.0176	

Note: *Surgical Wound, **Pressure Injury, ***Neonatal Infant Pain Scale.

Regarding the length of hospitalization, it was observed that most newborns stayed for more than 30 days, and all these cases showed statistical significance. Concerning hemoglobin levels, the majority had levels ≥ 11 g/dl, suggesting that these levels may not be related to the occurrence of skin injuries. For NIPS scores, most newborns scored below 4, indicating few signs of pain or discomfort.

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Regarding interventions, it was found that for newborns with SW (n=21; 100%) and other types of injuries (n=30; 100%), the administration of antibiotics was required. In contrast, most of those with perianal dermatitis (n=40; 90.9%) and PI (n=17; 89.5%) did not receive antibiotics. In the analysis related to the length of hospitalization and interventions, statistical significance was observed, suggesting a possible relationship between these variables.

Among the newborns who underwent phototherapy, 76.2% (n=16) had SW. On the other hand, among those who did not undergo this procedure: 84.2% (n=16) presented with PI, showing statistical significance; 54.5% (n=24) had dermatitis; and 66.7% (n=20) had other types of skin injuries, although without statistical significance.

For newborns with dermatitis, 77.3% (n=34) received total parenteral nutrition. However, among those who did not receive it, 71.4% (n=15) had SW (with statistical significance), 57.9% (n=11) had PI, and 53.3% (n=16) had other types of skin injuries, without statistical significance.

Table 3 presents the clinical and birth characteristics and their relationship with the types of skin injuries.

Table 3: Analysis of variance of variables and their relationship with types of injuries.

Characteristics	Dermatitis Mean (SD***)	FO* Mean (SD)	SW** Mean (SD)	p-value
Birth weight	2223.77 (971.31)[a]	2475.52 (725.73)[a]	1517.89(±753.94)[b]	0.0026
Gestational age	33.61 (4.29)[a]	35.57 (1.99)[a]	30.79(±3.90)[b]	0.0009
Apgar 1st minute	4.86 (2.89)	6.05 (2.94)	4.79(±2.76)	0.2535
Apgar 5th minute	7.50 (1.62)	7.48 (2.38)	7.21(±1.62)	0.8416
NSCS****	5.41 (0.62)[a]	5.76 (0.77)[ab]	5.26(±0.45)[ac]	0.0344
NIPS*****	1.57 (1.73)	0.95 (1.47)	1.74(±1.88)	0.2861
Healing time	6.06 (3.52)[a]	24.06 (13.89)[b]	12.89(±13.94)[ac]	0.0001
Length of hospitalization	32.75 (20.92)[a]	44.38 (16.81)[ab]	56.16(±33.94)[b]	0.0009

Note: *Surgical Wound, **Pressure Injury, ***Standard Deviation, ****Newborn Skin Condition Scale, *****Neonatal Infant Pain Scale.

According to birth weight, newborns with dermatitis (2,223.77g) and PI (1,517.89g) differed statistically ($p<0.05$), as did those with PI and SW (2,475.52g). The same pattern was observed concerning gestational age and types of injuries, with a higher gestational age found for newborns with SW and a lower gestational age for those with PI.

Regarding the NSCS, a statistically significant difference was observed between PI and SW ($p<0.05$), with a higher score for newborns with SW. For healing time, newborns with dermatitis or PI differed from those with SW ($p<0.01$), with the longest healing time observed in newborns with SW. Finally, concerning the length of hospitalization, there was a statistically significant difference between dermatitis and PI ($p<0.01$), with a longer hospitalization time for newborns with PI.

DISCUSSION

Skin injuries in newborns present a frequent challenge in providing care in NICUs. Preserving skin integrity is essential to ensure the quality of healthcare services, as a reduction in the number of injuries is directly related to fewer complications, both infectious and non-infectious[7].

The results of this study demonstrate that newborns with a higher number of injuries were male, had a birth weight of 2,501 grams or more, and a gestational age between 32 and 35 weeks and above 37 weeks. These newborns exhibited different types of injuries, such as perianal dermatitis, SW, PI, and other types of injuries. A study conducted in the neonatal unit of a teaching hospital in Fortaleza, Ceará, showed that the highest number of injuries occurred in male newborns with a gestational age of less than 31 weeks, predominantly dermatitis and PI[7].

Meanwhile, a study conducted in Australia found that 38% of hospitalized newborns presented skin injuries (bruises, abrasions, erythema, and PI) caused by venipuncture, moisture, heel lancets, and the use of medical devices, with the rates of these injuries decreasing as gestational age increased[13]. Research at the Hospital das Clínicas in Curitiba, Paraná, showed that all evaluated newborns had some dermatological diagnosis, of which 24% were traumatic injuries, 16.7% toxic erythema, and 5% contact dermatitis. The study also found that injuries were more frequent in male newborns of 34 weeks with an average weight of 2,107 grams, and that prematurity and age were determining factors for skin changes[14]. These findings are similar to those found in this study, reinforcing the need for preventive measures to ensure the skin integrity of premature newborns.

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In this investigation, the newborns who presented with PI most frequently were those who were very premature (approximately 30 weeks gestation) and had an average weight of 1,517.89 grams. The occurrence of SW also stood out as a significant concern for the nursing and medical teams, given that they increase the risk of infection and complications in healing. In this context, the role of the nursing team is crucial in preventing complications related to SW in newborns. These professionals are responsible for preoperative evaluation, preparing the environment and the patient for surgical procedures, postoperative monitoring, pain management, and other procedures to ensure the well-being and health of newborns[15-18].

Regarding the use of medical devices, there is a high incidence of injuries; however, these devices are essential for maintaining the lives of patients. Therefore, the healthcare team must invest more time in preventive care for these injuries through the management of purchasing high-quality devices specific to the neonatal segment, the use of prophylactic dressings, daily skin assessment, and classification of injuries[19].

A study conducted in the state of Minas Gerais, Brazil, investigated the relationship between the occurrence of skin injuries and the use of medical devices, finding that 72.9% of the evaluated newborns had skin injuries, with 64.7% being abrasions and 28.2% device-related injuries[20]. The authors highlighted the importance of the nursing team in identifying the risk of injuries and promoting qualified and humane care to mitigate associated complications, such as length of hospitalization, mortality rate, physical discomfort, and hospital costs. A study conducted with 8,126 hospitalized newborns in 22 hospitals in China revealed that 521 (6.41%) had iatrogenic injuries, of which: 47.98% were diagnosed with perianal dermatitis; 15.55% with PI related to medical devices; 13.44% with injuries caused by physical-chemical factors; and 13.24% with skin injuries associated with the use of adhesives. These findings indicate that the use of protective applications to prevent PI, careful removal of catheters, and the choice of appropriate adhesive tapes can minimize skin damage[21].

Among the strategies to prevent injuries in hospitalized premature newborns, the implementation of preventive measures from admission to discharge is highlighted. These measures include: constant monitoring of the skin; using materials and solutions suitable for skin needs; keeping the skin clean and dry; promoting regular position changes; taking care during the fixation of devices with adhesives during procedures; and periodic training of the healthcare team[16,22]. Other measures include using appropriate mattresses, such as “egg-crate” types[3,15], using hydrocolloids on bony prominences[3,23], applying mineral oil for adhesive removal[15,23], and rotating the pulse oximeter position to avoid burns[3,23].

Supporting this, studies suggest that it is necessary to implement care protocols based on scientific evidence to standardize practices and reduce the risk of injuries in newborns in NICUs[24,25]. Australian and New Zealand researchers also advocate for the implementation of evidence-based practices and cite skin surveillance every 2 to 6 hours[6] as an essential part of reducing the risk of skin injuries acquired during hospitalization[13].

Regarding the use of antibiotics, this study found that all newborns with SW and other types of injuries (such as hematomas, infiltrations, blisters, burns, among others) received antibiotics, which is recommended in these cases to prevent severe infections. A study conducted in a hospital in Foz do Iguaçu, state of Paraná, Brazil, highlighted that one of the complications faced by these newborns is sepsis, indicating the use of antibiotics to promptly treat resistant microorganisms and prevent early death[26]. Another study conducted in the southern region of Brazil, examining prematurity, low birth weight, male sex, use of antibiotics, and weight gain among newborns hospitalized for more than seven days in a neonatal intermediate care unit, emphasized the need for antibiotics due to the high incidence of infections, which required prolonged hospitalization[27].

It is worth considering that the onset of perianal dermatitis may result from diarrhea associated with antibiotic use, according to the literature[28]. However, in the present study, perianal dermatitis, the most frequent type of skin injury, could not be associated with diarrhea caused by antibiotic use, as most newborns with this type of injury did not receive antibiotic therapy.

It was observed that the length of hospitalization for newborns with skin injuries exceeded 30 days, and this prolonged period is directly associated with an increased risk of developing skin injuries due to extended exposure to risk factors, such as immobility and invasive interventions. Moreover, the appearance of skin injuries can trigger complications, such as infections, contributing to a longer hospital stay[3,15,22-24].

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Regarding the pain assessment scale, the NIPS scale was used in this study, and the majority of newborns had a score of 4 or higher, indicating few signs of pain or discomfort. The occurrence of pain during procedures in newborns triggers a variety of physiological, behavioral, and hormonal disturbances, which can negatively affect the neurological development of premature newborns, especially during prolonged hospitalization periods when their bodies are still maturing and their nervous systems are rapidly developing [10,29,30].

A systematic review by Italian researchers found evidence that repeated or prolonged exposure to pain can negatively affect neurological development and have long-term consequences. When newborns experience pain, it can trigger physiological and neuroendocrine responses, including the release of stress hormones, increased autonomic nervous system activity, and modulation of pain perception[30].

A study conducted by Brazilian researchers observed a deficiency in the preparation of nursing staff regarding neonatal pain management. A relevant aspect identified was the predominant behavior in some hospital units, where there is a lack of adequate attention to pain treatment in newborns. While there is knowledge about the practices of recognizing, managing, and treating pain, it is common for some healthcare institutions to neglect these procedures, often due to demands in other areas[31].

In addition to scales for assessing pain levels, the scientific literature suggests evaluating cortisol levels in urine. This approach broadens the understanding of the discomfort experienced by newborns, allowing the nursing team to perform a more precise intervention to reduce the impact of painful procedures[31]. Humanized practices in nursing care aim to ensure more compassionate and effective care for vulnerable newborns. Furthermore, the NSCS has proven to be an important tool for guiding nursing practice, as it assists in identifying skin injuries, understanding the factors associated with each, and contributing to timely and effective treatment strategies.

The findings highlight the importance of the multidisciplinary team understanding the factors that affect the skin of premature newborns. This knowledge allows for the early identification of injuries and the adoption of preventive measures, such as the use of appropriate products, correct body positioning to prevent PI, continuous skin assessment using validated instruments, and the proper use of medical devices. By promoting the implementation of these measures, there is a substantial contribution to safe and high-quality care, reducing the impact of pain on the development of premature newborns and promoting their well-being and health.

Study limitations

The limitations of this study include the lack or incompleteness of variables in electronic medical records, which hindered a detailed analysis. Additionally, the generalization of the results to other NICUs is not possible due to variations in skin care practices among healthcare institutions.

CONCLUSION

Most newborns who presented with skin injuries were male, with a gestational age between 32 and 35 weeks (moderate preterm) or above 37 weeks (full term), an average birth weight of 2,501 grams, and Apgar scores between 7 and 10 at the first and fifth minutes. Perianal dermatitis was the most common injury, followed by PI and SW, with PI being more common in preterm infants at 30 weeks of gestation and an average weight of 1,517.89 grams.

The hospitalization period for most newborns exceeded 30 days, which, along with the use of medical devices, may contribute to the development of skin injuries. The majority scored below 4 on the NIPS scale, indicating the absence of pain or discomfort. Further studies are needed to develop preventive practices and evaluation scales to improve the well-being of hospitalized premature newborns.

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