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RESEARCH ARTICLE (ORIGINAL)

Clinical and Epidemiologic Profile of Newborns Admitted to Neonatal Care Units of a High-Risk Maternity Hospital

Perfil Clínico e Epidemiológico dos Recém-Nascidos nas Unidades Neonatais de uma Maternidade de Alto Risco

Perfil Clínico y Epidemiológico de los Recién Nacidos en las Unidades Neonatales de una Maternidad de Alto Riesgo

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Abstract

Background: Due to the numerous complications that lead to the hospitalization of newborns after birth, comprehensive and humanized care is essential in neonatal care units within the Unified Health System.
Objective: To analyze the clinical and epidemiologic profile of newborns admitted to the neonatal care units of a major maternity hospital.
Methodology: A quantitative, cross-sectional study was conducted in a large public maternity hospital in the state of Piauí. The sample consisted of 85 newborns.
Results: Of all newborns, 54.1% were admitted to the Neonatal Intermediate Kangaroo Care Unit. The majority (50.6%) were baby girls with a mean gestational age of 34.5 weeks, ranging from 29 to 42, with respiratory problems as the main reason for hospitalization (67.1%), followed by prematurity (28.3%).
Conclusion: The characteristics of newborns, which reflect the complexity and diversity of conditions, require the formulation of health policies, the implementation of evidence-based care practices, and the promotion of positive neonatal outcomes.

Keywords: infant, newborn; health profile; intensive care units, neonatal; child health services

Resumo

Enquadramento: A hospitalização de recém-nascidos devido a complicações após o nascimento exige assistência humanizada e integral nas Unidades Neonatais do Sistema Único de Saúde.
Objetivo: Analisar o perfil clínico e epidemiológico dos recém-nascidos nas unidades neonatais de uma maternidade de referência.
Metodologia: Estudo transversal de abordagem quantitativa, realizado em uma maternidade pública de referência do estado do Piauí. A amostra foi constituída de 85 recém-nascidos.
Resultados: Do total de recém-nascidos, 54,1% foram internados na Unidade de Cuidados Intermediários Neonatal Canguru. A prevalência deu-se no sexo feminino (50,6%) com média de idade gestacional 34,5, variando de 29 a 42 semanas, tendo como principal motivo das internações os problemas respiratórios (67,1%), seguido da prematuridade (28,3%).
Conclusão: As características dos recém-nascidos, que refletem a complexidade e a diversidade das condições presentes, tornam necessária a formulação de políticas de saúde, a implementação de práticas de cuidado baseadas em evidências e a promoção de resultados neonatais positivos.

Palavras-chave: recém-nascido; perfil epidemiológico; unidades de terapia intensiva neonatal; serviços de saúde da criança

Resumen

Marco contextual: La hospitalización de los recién nacidos por complicaciones tras el parto requiere una atención humanizada e integral en las Unidades de Neonatología del Sistema Único de Salud.
Objetivo: Análisis del perfil clínico y epidemiológico de los recién nacidos en las unidades neonatales de una maternidad de referencia.
Metodología: Estudio transversal con abordaje cuantitativo, realizado en una maternidad pública del estado de Piauí. La muestra fue de 85 recién nacidos.
Resultados: El 54,1% estaban hospitalizados en la Unidad de Cuidados Intermedios Neonatales Canguro. La prevalencia fue del sexo femenino (50,6%), con una media de edad gestacional de 34,5, que varió de 29 a 42 semanas, y cuyo principal motivo de ingreso fueron los problemas respiratorios (67,1%), seguidos de la prematuridad (28,3%).
Conclusión: Las características de los recién nacidos, que reflejan la complejidad y diversidad de las afecciones, requieren la formulación de políticas sanitarias, la aplicación de prácticas asistenciales basadas en la evidencia y la promoción de resultados neonatales positivos.

Palabras clave: recién nacido; perfil epidemiológico; unidades de cuidados intensivos; servicios de salud infantil

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Introduction

The neonatal period lasts from the first to the 28th day of life and is characterized by great vulnerability (Aguiar et al., 2022). According to the same authors, the classification of newborns (NBs) based on gestational age (GA) specifies that preterm refers to babies born at less than 37 weeks, full-term refers to those born between 37 and 41 weeks and 6 days, and postterm refers to those born at 42 weeks or more.

The number of deaths in this population remains high due to the many complications that lead to the hospitalization of NBs. In 2021, 22,455 deaths of infants up to 28 days of age were recorded in Brazil, of which 7,184 were in the Northeast region and 432 in the state of Piauí (Ministério da Saúde, 2022). Knowing the clinical and epidemiologic profile of newborns cared for in a major high-risk maternity hospital is fundamental to ensure adequate care for the specific needs of these patients.

Regulation No. 930/2012 (Ministério da Saúde, 2012) establishes guidelines and objectives for the organization of comprehensive and humanized care for critically ill or potentially critically ill NBs, as well as criteria for the classification and qualification of beds in neonatal care units within the Unified Health System (SUS). In this context, this study aims to analyze the clinical and epidemiologic profile of NBs cared for in the neonatal care units of a major maternity hospital, contributing to the planning and improvement of neonatal care policies.

Background

The neonatal inpatient unit in high-risk maternity hospitals focuses on the comprehensive care of critically or potentially critically ill NBs and is based on physical structures, equipment, and specialized human resources to provide qualified care. These units are organized into two main levels: The Neonatal Intensive Care Unit (NICU), which is designed to care for NBs with severe clinical conditions, and the Neonatal Intermediate Care Unit (NIMCU), which is designed to care for intermediate-risk cases (Exequiel et al., 2023).

NIMCUs are further divided into two types, depending on the specific care required. The Conventional Neonatal Intermediate Care Units (CoNIMCU) provide care for NBs who are considered medium risk and require ongoing care but are less complex than NICU patients. The Kangaroo Neonatal Intermediate Care Unit (KaNIMCU) is structured to allow the practice of the kangaroo method, which promotes continuous interaction between mother and baby until hospital discharge (Ministério da Saúde, 2012).

Several studies point to the importance of tracking the clinical and epidemiologic profile of NBs cared for in high-risk maternity hospitals, as this contributes to the organization and quality of neonatal health services. These analyses make it possible to identify key needs and direct appropriate resources to improve care, especially in highly complex contexts. Available data on major maternity hospitals indicate that the majority of NBs admitted have complications related to prematurity, low birth weight, respiratory syndromes, and neonatal infections, which reinforces the need for specialized interventions (Prazeres et al., 2021).

Nursing plays an essential role in this context, focusing on the newborn's adaptation to the extrauterine environment through technologies and practices that promote thermal stability, humidity control, and adequacy of light, sound, and tactile stimuli. In addition, nurses monitor the clinical evolution of patients, assess prognostic signs, and coordinate care in the neonatal unit, directly contributing to the recovery and well-being of the NB (Prazeres et al., 2021).

Research question

What is the clinical and epidemiologic profile of NBs in the neonatal care units of a high-risk maternity hospital?

Methodology

This is a cross-sectional study with a quantitative and observational approach, carried out in a public maternity hospital in the state of Piauí. The institution provides highly complex care to pregnant women, postpartum women, and NBs from the capital and other cities in the state. Recognized as the largest maternity hospital in Piauí, it has a total capacity of 248 obstetric beds and 167 neonatal beds and is responsible for 63% of the births in Teresina, with an average of 1,200 admissions per month, of which 900 are deliveries. The unit has two NICUs with 30 beds (NICU 1 and 2), one CoNIMCU with 20 beds, and one KaNIMCU with 19 beds (Secretaria de Saúde do Piauí, 2023).

The inclusion criteria for the study were NBs less than 28 days old and the exclusion criteria were those admitted to a rooming-in unit. The sample consisted of 85 NBs admitted to the neonatal care units of the institution between August and October 2023.

Data were collected using a questionnaire adapted from Souza (2012), which included open-ended and closed-ended questions about the birth and hospitalization characteristics of the NBs. The variables analyzed in the study included: hospital record, gender, place of birth, GA in weeks, birth weight, Apgar 1- and 5-minute scores, head circumference (HC), height, chest circumference (CC), reason for hospitalization/initial diagnosis, presence of sepsis, use of drains, phototherapy, sedation/analgesia, urinary catheter, respiratory, intravenous, and nutrition therapy, current weight, vaccinations, heel prick test, and length of stay until the date of data collection.

Data were collected after obtaining the consent of the NB caregivers by signing the Informed Consent Form (ICF). Physical medical records were consulted whenever necessary. Data were entered into Microsoft Excel for Windows software, version 2019, and then exported to IBM SPSS Statistics software, version 22.0, for organization

and analysis. Absolute (*N*) and relative (%) frequencies were calculated, as well as measures of central tendency and dispersion, such as mean and standard deviation. For variables without a normal distribution, median, minimum, and maximum values were used.

This study was approved by the Research Ethics Committee, Opinion No. 5.706.056.

Results

Of the 85 NBs, 54.1% were in the KaNIMCU, followed by 34.1% in the CoNIMCU. The majority were female (50.6%), born at the maternity hospital itself (98.8%), with a mean GA of 34.5 weeks, ranging from 29 to 42 weeks. The mean birth weight was 1,727.3 grams, ranging from 625 to 2,965 grams. Apgar scores at 1 minute averaged 7.4, ranging from 2 to 9, and at 5 minutes averaged 9.2, ranging from 5 to 10. Anthropometric data showed a mean HC of 29.9 centimeters, ranging from 22 to 37, a mean height of 41.9 centimeters, ranging from 33 to 49, and a mean CC of 26.5 centimeters, ranging from 20 to 32.

Regarding the NBs' clinical profile, the presence of sepsis was noted in 9.4% of them. In addition, 12.9% were receiving phototherapy, 3.5% were receiving sedation/analgesia, none had a drain, and only 2.3% had a urinary catheter. Although 91.8% of NBs were not receiving respiratory therapy and 60% were not receiving intravenous therapy, 88.2% were receiving enteral nutrition therapy. The most common vaccination was hepatitis B, which all NBs had received; however, the absence of BCG is due to the ideal weight for specific immunization. The heel prick test was performed in all NBs, and those who had at least two samples (35.3%; Table 1) were the most common.

Table 1

Analysis of the newborns' profile in the neonatal care units of a major maternity hospital (n = 85)

Variable	*N* (%)	*M*	Median	Mode	*SDP*	Min- Max
Hospital unit						
KaNIMCU	46 (54.1)					
CoNIMCU	29 (34.1)					
NICU	10 (11.8)					
Gender						
Female	43 (50.6)					
Male	41 (48.2)					
Indeterminate	1 (1.2)					
Place of birth						
Maternity	84 (98.8)					
Home	1 (1.2)					
Gestational age		34.5	34	34	3.445	29 - 42
Birth weight		1,727.3	1,735	2,100	517.671	625 – 2,965
1-minute Apgar score		7.4	8	8	2.024	2 - 9
5-minute Apgar score		92	9	9	0.936	5 - 10
Head circumference		29.9	30	32	3.024	22 - 37
Height		41.9	42.5	45	3.486	33 - 49
Chest circumference		26.5	27	24	2.834	20 - 32
Presence of sepsis						
Yes	8 (9.4)					
No	77 (90.6)					
Phototherapy						
Yes	11 (12.9)					
No	74 (87.1)					
Sedation/ analgesia						
Yes	3 (3.5)					
No	82 (96.5)					

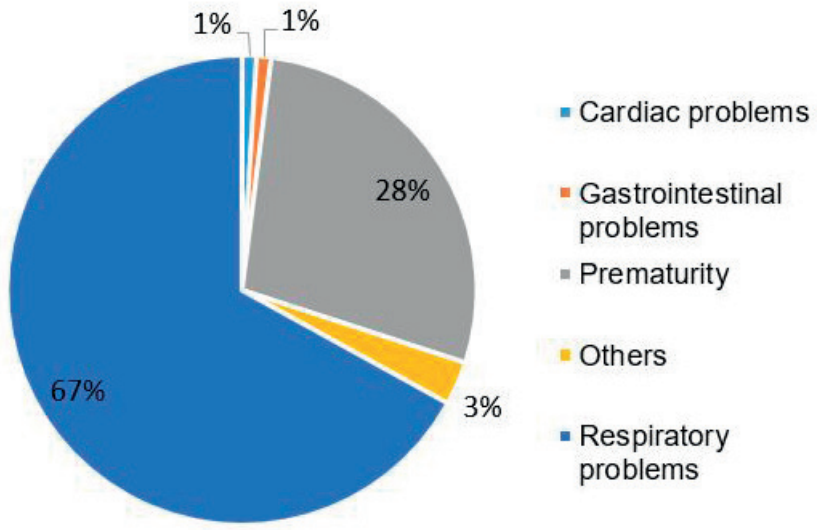
Use of drains						
Yes	0 (0.0)					
No	85 (100)					
Use of urinary catheters						
Yes	2 (2.3)					
No	83 (97.7)					
Respiratory therapy						
CPAP*	2 (2.3)					
NIV**	5 (5.9)					
Without support	78 (91.8)					
Intravenous therapy						
Antibiotics	5 (5.8)					
Corticoids	1 (1.2)					
Hydration	14 (16.5)					
Other	14 (16.5)					
No therapy	51 (60.0)					
Nutrition therapy						
Enteral	75 (88.2)					
Parenteral	2 (2.4)					
Enteral and parenteral	4 (4.7)					
No diet	4 (4.7)					
Vaccinations						
BCG ***and Hepatitis B	22 (25.9)					
Hepatitis B	63 (74.1)					
Heel prick test						
1st sample	18 (21.2)					
2nd sample	30 (35.3)					
3rd sample	12 (14.1)					
Single sample	25 (29.4)					
Current weight		1,755.6	1,690	1,565	420.699	966 – 3,165
Length of stay		19.5	12	6	20.7	2 - 96

Note. M = Mean*; SD* = Standard-deviation*; N* = Absolute number*; %* = Percentage; Max – Min = *Maximum and minimum;* CPAP* = *Continuous Positive Airway Pressure*, NIV ** = Non-Invasive ventilation, BCG*** = Bacillus Calmette-Guérin.

Respiratory problems (67.1%), followed by prematurity (28.3%; Figure 1), were the main reasons for admission to neonatal care units.

Figure 1

Reasons for admission in neonatal care units of a major maternity hospital (n= 85)



Discussion

This study identified the variability of neonatal care units, with the aim of defining the profile of NBs admitted to the neonatal care units of a major maternity hospital. It was found that the NIMCUs (KaMINCU and CoNIMCU) have a higher number of NBs, which does not mean that these units have more patients, but that there is a lower turnover of NICU beds, as well as a higher number of deaths. In Brazil, there is a discrepancy between legislation and practice, since there is a minimum number of each type of neonatal care unit that must be present in maternity wards, but this is not the case in most places. This may explain the lack of studies mentioning the number of babies in each maternity hospital (Fônseca et al., 2023; Miranda et al., 2021).

Analyzing the variables related to the birth, this research shows that 50.5% of the NBs were female and 98.83% were born in maternity hospitals. In contrast, studies conducted in Piauí (Fônseca et al., 2023) and Amazonas (Silveira et al., 2023) found a higher percentage of male births. The high frequency of births in maternity hospitals may be explained by the normalization of hospital interventions during this process (Santos et al., 2022).

The anthropometric measurements found in this study showed a mean preterm birth weight of 1727.3 grams, HC of 29.9 centimeters, height of 41.8 centimeters, and CC of 26.5 centimeters. Studies conducted in different populations in Brazil and around the world have confirmed that prematurity, low birth weight, and HC of less than 30 centimeters at birth are more common (Fônseca et al., 2023; Silveira et al., 2023).

The Apgar scores observed at 1 minute ranged from 2 to 9, with the main value observed being 8. At 5 minutes, the range was from 5 to 10, with the main value being 9. These results are consistent with those described in the states of Amazonas and Alagoas (Omena et al., 2020; Silveira et al., 2023).

Regarding the length of stay, the mean found in the current study was 19.5 days, while studies carried out in other NICUs found mean values ranging from 23 to 38.7 days. Most of the babies did not require treatment for sepsis or pain, but underwent phototherapy, drainage, or urinary catheterization. A study in a public maternity hospital in Santa Catarina showed that antibiotics and phototherapy were used in many NBs after birth. These differences may be explained by the lack of studies in other types of neonatal care units, not only NICUs (Fônseca et al., 2023; Gumboski et al., 2022; Oliveira et al., 2020).

All 85 NBs studied had their heel prick tested, and most required two samples. This test is essential for the early detection of various metabolic disorders in NBs, allowing for timely diagnosis. Appropriate monitoring and treatment help to prevent worsening of pathologies and possible death (Vasconcelos et al., 2021).

The mean weight of the NBs at the time of the test was 1,755.6 grams. This variable is essential in neonatal monitoring, especially in preterm NBs, as it allows nutrition therapy to be adapted, since babies have a high energy requirement due to their accelerated metabolism. The kangaroo method is a fundamental tool for the development of preterm NBs, using weight as a parameter for the transition between stages and subsequent discharge, highlighting the importance of monitoring this anthropometric data (Li et al., 2022; Ministério da Saúde, 2017).

The vaccination calendar for premature infants emphasizes the importance of vaccinating NBs, even when they are still hospitalized, due to the immaturity of their immune system. In this study, all NBs were immunized against hepatitis B. However, due to the minimum adequate

weight for the administration of other immunizers in the calendar, some vaccines were not administered (Sociedade Brasileira de Pediatria, 2022).

In the maternity hospital where the data were collected, it was found that respiratory problems and prematurity were the main reasons for hospitalization, requiring the use of respiratory and intravenous devices, while nutrition was mainly enteral. In Ceará, it was found that 94.3% of NBs in the NICU required respiratory intervention, a difference explained by the population studied, which includes NBs with greater severity, since birth does not allow the respiratory system to fully mature (Oliveira et al., 2020) It is believed that the information presented can help the multiprofessional health team, based on the characteristics from birth. The study had some limitations, mainly related to the emotional fragility of mothers in the face of their child's diagnosis and the impossibility of early discharge, which reduces the turnover in neonatal care units, limiting the study sample.

Conclusion

This study has made it possible to characterize the profile of NBs admitted to a high-risk maternity hospital, outlining the particularities of NBs for subsequent care planning and the development of interventions aimed at the main needs observed in maternity hospitals. Further studies should be conducted to address the characteristics of NBs, reflecting the complexity and diversity of conditions that may affect this age group, as well as research on specific neonatal care units and their particularities, with a view to formulating health policies, implementing evidence-based care practices and promoting positive neonatal outcomes.

Author contributions

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Writing – review & editing: Costa, M. S., Gouveia, M. O., Dantas, A. B.

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