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PROFILE OF PAEDIATRIC PATIENTS TRANSFERRED TO THE INTENSIVE CARE UNIT

PERFIL DE PACIENTES PEDIÁTRICOS TRANSFERIDOS PARA UTI

PERFIL DE PACIENTES PEDIÁTRICOS TRANSFERIDOS A UCI

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ABSTRACT
To describe the epidemiological and clinical profile of pediatric patients admitted to a secondary hospital who were transferred to the intensive care unit, as well as to report the final outcome after 30 days of transfer to the ICU. This was a retrospective descriptive study conducted by the medical, nursing, and general hospital nursing coordinations, a pediatrician, and an academic nursing student in a pediatric ward. The participant sample included patients admitted to a pediatric ward who were transferred to the intensive care unit from January to December 2023, in a secondary hospital in Ceará. Data were collected from physical medical records, electronic medical records, and ICU transfer management spreadsheets. The information was recorded through Google Forms, generating a database stored in a Microsoft Office Excel spreadsheet. The variables were categorized for better data analysis, and absolute and relative frequencies were calculated and presented in the form of tables and figures. There were a total of 89 transfers from the pediatric clinical bed ward to the pediatric ICU, 69.7% of whom were males and 30.3% were females. Regarding the age group, 53.9% of the transfers corresponded to children up to 2 years of age. We observed that 32.6% of the transfers to the pediatric ICU were performed within 24 hours of admission to the ward and 13.5% were transferred between 24 hours and 48 hours of admission. The outcome within 30 days of ICU transfer showed a favorable outcome, corresponding to 93.3% of the patients. The present study collects epidemiological data from a pediatric unit, favoring the knowledge of its profile for managers and employees.
Keywords: *Clinical Epidemiology; Pediatrics; Pediatric Intensive Care Units; Early Warning Score*.

RESUMO
Descrever o perfil epidemiológico e clínico de pacientes pediátricos internados em um hospital secundário que foram transferidos para unidade de terapia intensiva, bem como relatar o desfecho final após 30 dias de transferência para UTI. Estudo retrospectivo de caráter descritivo, realizado pelas coordenações médica, de enfermagem e geral hospitalar de enfermagem, médica pediatra e aluna acadêmica de enfermagem de uma enfermaria pediátrica. A amostra participante incluiu pacientes internados em enfermaria pediátrica que foram transferidos para unidade de terapia intensiva no período de janeiro a dezembro do ano de 2023, em um hospital secundário do Ceará. Os dados foram coletados em prontuário físico, prontuário eletrônico e planilha de gerenciamento de transferências para UTI. As informações foram registradas por meio de Google Forms, gerando um banco de dados armazenado em planilha de Microsoft Office Excel. As variáveis foram categorizadas para melhor análise dos dados, sendo calculadas as frequências absolutas e relativas e dispostas para apresentação em formas de tabelas e figuras. Houve um total de 89 transferências da enfermaria de leitos clínicos pediátricos para UTI pediátrica, sendo 69,7% do sexo masculino e 30,3% do sexo feminino. Em relação à faixa etária, 53,9% das transferências corresponderam a crianças de até 2 anos de idade. Observamos que 32,6% das transferências para UTI pediátrica foram realizadas em menos de 24 horas da admissão na enfermaria e 13,5% foram transferidos entre 24 horas e 48 horas da internação. O desfecho em até 30 dias da transferência para UTI mostrou um desfecho favorável que corresponde a 93,3% dos pacientes. O presente estudo levanta dados epidemiológicos de uma unidade pediátrica, favorecendo o conhecimento do seu perfil para gestores e colaboradores.
Descritores: *Epidemiologia Clínica; Pediatria; Unidades de Terapia Intensiva Pediátrica; Escore de Alerta Precoce*.

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RESUMEN

Describir el perfil epidemiológico y clínico de los pacientes pediátricos ingresados en un hospital secundario que fueron transferidos a una unidad de cuidados intensivos, así como relatar el desenlace final a los 30 días de la transferencia a la UCI. Se trata de un estudio retrospectivo de carácter descriptivo, realizado por las coordinaciones médica, de enfermería y general hospitalaria de enfermería, médica pediatra y estudiante de enfermería de una sala pediátrica. La muestra participante incluyó a pacientes ingresados en la sala pediátrica que fueron transferidos a la unidad de cuidados intensivos en el período de enero a diciembre del año 2023, en un hospital secundario de Ceará. Los datos se recopilaron en el historial médico físico, expediente electrónico y hoja de gestión de transferencias a la UCI. La información se registró a través de Google Forms, generando una base de datos almacenada en una hoja de cálculo de Microsoft Office Excel. Las variables se categorizaron para un mejor análisis de los datos, calculando las frecuencias absolutas y relativas y presentándolas en forma de tablas y figuras. Hubo un total de 89 transferencias de la sala de camas clínicas pediátricas a la UCI pediátrica, siendo el 69,7% de sexo masculino y el 30,3% de sexo femenino. En cuanto a la franja etaria, el 53,9% de las transferencias correspondieron a niños de hasta 2 años de edad. Observamos que el 32,6% de las transferencias a la UCI pediátrica se realizaron en menos de 24 horas desde la admisión en la sala y el 13,5% fueron transferidos entre 24 horas y 48 horas desde la hospitalización. El desenlace a los 30 días de la transferencia a la UCI mostró un desenlace favorable que corresponde al 93,3% de los pacientes. El presente estudio proporciona datos epidemiológicos de una unidad pediátrica, favoreciendo el conocimiento de su perfil para gestores y colaboradores.

Descriptores: *Epidemiología Clínica; Pediatría; Unidades de Cuidados Intensivos Pediátricos; Puntaje de Alerta Temprana.*

INTRODUCTION

According to data from the National Registry of Health Establishments (CNES), maintained by the Ministry of Health, Brazil has suffered a significant drop in the number of pediatric beds in the SUS in the last 10 years, from 45,333 pediatric beds in November 2013 to 36,901 beds in November 2023. This decrease represents 8,432 deactivated beds[1].

The deactivation of beds impacts the speed of assertive clinical conductions, thus increasing the number of patients waiting for beds, which can trigger the severity of cases[2]. Thus, an insufficient hospital supply increases the complexity requirement for patients who manage to be admitted to hospital units, in addition to contributing to a high length of stay and low turnover, aggravating the issues of overcrowding in emergency rooms[3].

In recent decades, we have witnessed a transition in the profile of infant morbidity and mortality, with a reduction in infant mortality rates in the country. This reduction is accompanied by an increase in the number of chronic patients in the health system. Thus, there is also an increase in the number of hospitalizations of these patients, contributing to the long stay and greater complexity of the cases. This higher demand for pediatric beds is reflected in the greater need for Intensive Care Unit (ICU) beds[4].

Knowledge of the epidemiological data on morbidity and mortality of a health unit allows strategic decision-making aimed at improving the quality of care. The acquisition of technologies, the training of human resources, the reassessment of care processes and structural adaptation can be planned with a view to adapting the unit to the demographic and morbidity characteristics of the population it receives[5].

There is a lack of literature related to epidemiological data on pediatric beds. Thus, this study aims to describe the epidemiological and clinical profile of pediatric patients

admitted to a ward of a secondary hospital, as well as to report the final outcome after 30 days of transfer to the ICU of these patients.

METHODS

This is a retrospective descriptive study conducted by the medical, nursing, and general nursing coordinations, a pediatrician, and an academic nursing student in a pediatric ward. The participant sample included patients admitted to a pediatric ward who were transferred to the intensive care unit from January to December 2023, in a secondary hospital in Ceará.

Data were collected using physical medical records, electronic medical records, and ICU transfer management spreadsheets. The information was recorded through Google Forms, generating a database stored in a Microsoft Office Excel spreadsheet.

The data collected from medical records were distributed into the following items: age, gender, length of stay until ICU transfer, type of final outcome (discharge, death, or external transfer), admission diagnosis, comorbidity, and reason for transfer. The variables were categorized for better data analysis, and absolute and relative frequencies were calculated and presented in the form of tables and figures.

For the elaboration of the study, all ethical-legal precepts were respected, as provided for in Resolution No. 466, of December 12, 2012, of the National Health Council, which governs research involving human beings, ensuring the individuality, privacy and confidentiality of patient information. The research project was approved by the Ethics Committee, with opinion No. 6,625,810 in Plataforma Brasil.

The pediatric ward of the institution studied receives children aged between 29 days of age and 18 years of age, with pathologies of secondary care level. It has 66 beds, 56 of which are for general clinical pediatrics, 2 isolation beds and 8 beds for Special Care Unit (CSU) for chronic patients dependent on mechanical ventilation. Patients are admitted via regulation of the State Regulation Center - Fastmedic. The institution also has a Pediatric Intensive Care Unit with 8 beds, for the same age group.

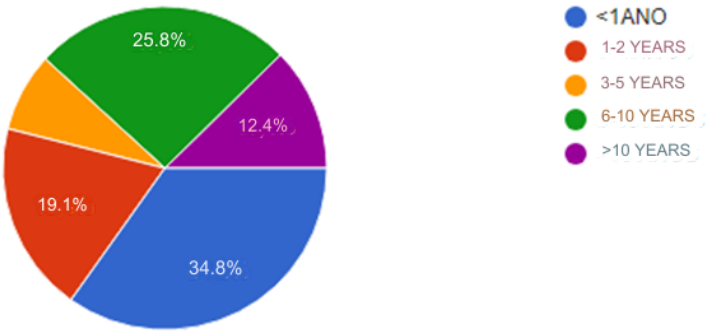
The study was carried out with data from the year 2023, since it was the year of return of stability in the profile of hospitalized patients. During the years 2020, 2021 and 2022, with the Covid-19 pandemic, the hospital experienced atypical situations from what it had in its historical series. In the pediatric ward, the impact was due to periods of low occupancy rate, alternating with periods of high occupancy rate. This variation hinders the analysis of data referring to this atypical period.

RESULTS

In 2023, we had 89 transfers from the Pediatric Clinic to the pediatric ICU. Of these, 69.7% (n=62) were male and 30.3% were female (n=27). There were 60 transfers in the first half of the year and 29 transfers in the second half of the year.

The age range of the hospitalized children was also observed. It was observed that 53.9% of the transfers corresponded to children up to 2 years of age. The prevalence was followed by hospitalized children between 6 and 10 years of age, representing 25.8%. Between 1-2 years old, they represented 19.1%; older than 10 years, 12.4%; and between 3 and 5 years, they had 7.9% (see Graph 1).

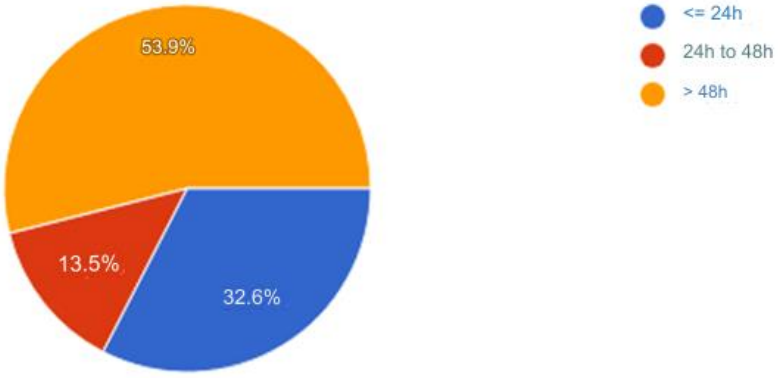
Graph 1- Distribution of patients transferred from the pediatric ward of a secondary hospital in the State of Ceará to the pediatric ICU by age group in 2023.



Source: Authored by the authors.

We observed that 32.6% (n=29) of the transfers to the pediatric ICU were performed within less than 24 hours of admission to the ward and 13.5% (n=12) were transferred between 24 hours and 48 hours of admission (Graph 2).

Graph 2 - Length of stay in the pediatric ward of a secondary hospital in the State of Ceará before transfer to the pediatric ICU.



Source: Authored by the authors.

Regarding the main reasons for transfers to the pediatric ICU, we observed that respiratory failure was the most prevalent diagnosis, 53.9% (N=48), followed by postoperative follow-up (n=14).

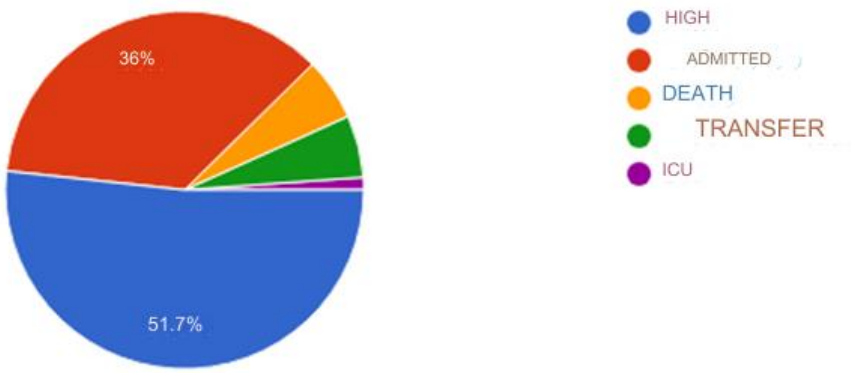
Of the transferred patients, 61.8% had some comorbidity (n=55). 31.5% of the transferred children had chronic encephalopathy, followed by pulmonary disorders, and the rest of the results were distributed in other comorbidities.

The number of patients transferred to the ICU who activated the Sepsis Protocol while still in the ward corresponded to 29.2% (n=26) of the cases.

We also analyzed the activation of the Pediatric Early Warning Score (PEWS), the pediatric early warning score used in our unit in an adapted way. In our unit, the PEWS is applied in the evaluation of acute deterioration of patients without comorbidity of malnutrition, who have a body surface area compatible with their chronological age. Of the children transferred to the pediatric ICU, 59 were evaluated by the PEWS, and 57.6% (n=34) activated the early warning score in the 12 hours prior to transfer.

The final outcome at 30 days of transfer to the pediatric ICU was also assessed. It was evidenced that 51.7% (n=46) of the pediatric patients were discharged from the hospital, 36% (n=32) were discharged from the ICU but remained hospitalized in the ward, 5.6% (n=5) died in the intensive care unit, 5.6% (n=5) were transferred to a tertiary hospital, and 1.1% (n=1) remained hospitalized in the intensive care unit.

Graph 3 - Final outcome of patients transferred to the pediatric intensive care unit after 30 days.



Source: Own authorship.

DISCUSSION

The higher number of ICU transfers in the first semester corroborates the literature and reflects the seasonality of the rainy season known in our state. In this period from January to June, there is a greater circulation of respiratory viruses, which contribute to the greater infection in patients in the pediatric age group.

In the analysis of the data, it was observed that about 46.1% of the patients admitted to the ward were transferred to the ICU within 48 hours of admission. This data reflects the severity with which patients are already admitted to the ward bed. It is important to correlate this data with subsequent studies of association with the waiting time for a bed in urgent and emergency departments to determine whether patients could be admitted in lesser severity or not.

According to Bittencourt *et al*. (2009), the increase in the length of stay in the Hospital Emergency Department (SEH) is the main marker of overcrowding; lack of beds for hospitalization is the main cause; and delay in diagnosis and treatment is the main consequence, leading to increased mortality.

Respiratory diseases occupy a prominent position in the diseases that affect children and compete with up to 50% of ICU admissions in all age groups. Pathologies such as asthma, bronchiolitis, and pneumonia are responsible for up to 30% of clinical admissions and are present in about 60% of children who develop cardiac arrest[6]. Thus, it was possible to understand that the main diagnosis of clinical admissions and reason for transfer is related to the profile of the hospital unit studied, respiratory infections.

It should be noted that the ICU transfer diagnoses were compiled considering the main motivator for transfer. Sometimes, the patient may have had other clinical associations, but what was detailed in the study was the criterion for indication of ICU vacancy.

There is a significant number of transfers of children with comorbidities such as chronic encephalopathy, corresponding to 31.5% of hospitalizations, which poses new challenges for the organization of care services.

The care required by children and adolescents with chronic diseases has also been the object of increasing interest[7, 8]. The changes in the profile of pediatric hospitalizations are also due to the processes of incorporation of technologies that provide a longer survival for children who were previously destined to die early[9].

Understanding that sepsis is an organic dysfunction in which signs and symptoms must be recognized early and with great importance in the pediatric age group, due to high morbidity and mortality, assessing the profile and recognizing the severity of patients with septic conditions is a fundamental factor in the outcome. 29.2% of the transferred patients had open sepsis protocols. The literature shows that the early detection of sepsis in pediatrics is of fundamental importance for a favorable prognosis for patients, considering that if a correct diagnosis is not made and, necessarily, an appropriate therapeutic procedure for sepsis is not made, the pathology may rapidly evolve to septic shock and make the treatment of the patient even more difficult[10].

The evaluation of the activation of the pediatric alert score is an important instrument for early recognition of the severity of patients and its association with ICU transfer can guide measures to reinforce the instrument. Approximately 57.6% of the transferred patients who were eligible for PEWS had the score triggered. The rapid and effective recognition of signs and symptoms that indicate severity or predict clinical deterioration in critically ill pediatric patients is a decisive factor for the survival and good prognosis of these patients[11]. Further studies are needed to delve deeper into the role of this score in ICU transfer.

The outcome within 30 days of ICU transfer was analyzed, which showed a favorable outcome (discharged, external transfer, or remain hospitalized) of 93.3% of the patients. Only 5.6% (n=5) died within 30 days of being transferred to the ICU in 2023. A mortality profile study in a pediatric intensive care unit in Brazil[12] found a number of 36 deaths in 5 years, showing relative proportional similarity to the data found in our study.

The study of the profile of patients transferred to the Intensive Care Unit is part of the management of the unit's processes, which direct decision-making to optimize the occupancy of beds in the state's health network. The adequacy of the supply of beds to the demand reflects on hospital services as much as on emergency services. Interventions in the health system to address congestion and overcrowding in hospital emergency departments seek to strengthen planning, management, and regulation capacities to coordinate emergency care efforts in a timely manner and with satisfactory care outcomes for patients and their families.

CONCLUSION

The present study collects important epidemiological data from a secondary pediatric unit, favoring the knowledge of its profile for managers and employees. Its limitation is that it does not carry out the analysis of previous years, due to the readjustment of beds during the Covid-19 pandemic. The continuity of the analyses in the coming years should strengthen the management of the processes, deepening the

understanding of the results and allowing better use of the resources of the state's health network. It is expected that further studies will be carried out, in order to complement the information collected, in order to produce more data in the literature to foster public policies for pediatric hospital beds.

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