HOSPITALIZAÇÕES POR DIARREIA EM CRIANÇAS MENORES DE CINCO ANOS*
HOSPITALIZATIONS DUE TO DIARRHEA IN CHILDREN UNDER FIVE YEARS OLD
HOSPITALIZACIONES POR DIARREA EN NIÑOS MENORES DE CINCO AÑOS

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RESUMO

Objetivo: descrever as características epidemiológicas das internações hospitalares por doenças diarréicas agudas em crianças menores de cinco anos de idade. Método: trata-se de um estudo quantitativo, descritivo, ecológico, de séries temporais, sobre internações hospitalares por doenças diarréicas agudas em crianças menores de cinco anos, entre 2010 e 2019. Coletaram-se os dados por meio do Sistema de Informações Hospitalares, analisando-os por meio da estatística descritiva. Resultados: observaram-se 21.805 internações hospitalares por doenças diarréicas em menores de cinco anos, entre os anos de 2010 a 2019. Prevaleceram-se as internações na faixa etária entre um e quatro anos (76,9%), no sexo masculino (52,3%) e na cor parda (52,5%). Nota-se que o mês de janeiro foi o que apresentou o maior número de casos (12%). Conclusão: conclui-se que o número de internações hospitalares diminuiu consideravelmente ao longo dos últimos dez anos, contudo, é necessária a adoção de cuidados redobrados, principalmente, no período chuvoso.

Descritores: Diarrhea; Infant Diarrhea; Hospitalization; Child; Epidemiology; Public Health.
RESUMEN

Objetivo: describir las características epidemiológicas de los ingresos hospitalarios por enfermedades diarreicas agudas en niños menores de cinco años. Método: se trata de un estudio cuantitativo, descriptivo, ecológico, de series de tiempo sobre ingresos hospitalarios por enfermedades diarreicas agudas en menores de cinco años, entre 2010 y 2019. Los datos se recolectaron a través del Sistema de Información Hospitalaria, analizándolos mediante estadística descriptiva. Resultados: se observaron 21,805 ingresos hospitalarios por enfermedades diarreicas en menores de cinco años, entre los años 2010 a 2019. Las hospitalizaciones entre uno y cuatro años (76,9%) fueron prevalentes en varones (52,3%) y marrón (52,5%). Se observa que el mes de enero fue el de mayor número de casos (12%). Conclusión: se concluye que el número de ingresos hospitalarios ha disminuido considerablemente en los últimos diez años, sin embargo, es necesario adoptar un cuidado especial, especialmente en la época de lluvias.

Descripciones: Diarrea; Diarrea Infantil; Hospitalización; Niño; Epidemiología; Salud Pública.

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It is detailed that the ADD is characterized as a syndrome in which the amount of aqueous or inconsistent evacuations predominates, mainly due to the low quality of drinking water, insufficient basic sanitation and nutritional deficiencies.² It is added that many other factors can also favor the appearance of diarrhea and gastroenteritis, which can be associated with climate, type of etiological agent, immune system and age range of the host.³

It is described that, even though it is known that viruses, bacteria and protozoa can cause acute diarrheal diseases and, although it is a public health problem throughout the Brazilian territory, there are variations according to the region of the country, where the North and Northeast regions stand out for the highest prevalence.⁴

In 2006, the vaccine against rotavirus, indicated to prevent gastroenteritis, was included in the basic Brazilian vaccination calendar.⁵ Rotaviruses are the main cause of acute gastroenteritis and the fecal/oral route is the most frequent transmission mechanism.⁶

It is reported that the rate of deaths and hospitalizations for diarrhea in children under five years in Brazil in the period 2000-2010 was 22,933 deaths (80.3% in children under one year) and 1,209,622 hospitalizations (62.6% in children between one and four years), with the Northeast region responsible for 57.0% and 46.0%, respectively, of this total.⁷

It is warned that children with diarrhea can present several symptoms, such as loss of appetite, vomiting, weight loss and fever and, in more severe cases or where the diarrhea lasts longer, dehydration becomes probable, increasing the chances of hospitalization, and babies and children are more susceptible to dehydration, which can cause seizures, brain damage and even death.⁸

**OBJECTIVE**

To describe the epidemiological characteristics of hospital admissions due to acute diarrheal diseases in children under five years of age.

**METHOD**

This is a quantitative, descriptive, ecological, time series study of reported cases of hospitalization for acute diarrheal diseases in children under five years of age, occurring in the State of Piauí, between 2010 and 2019.

The information on hospitalizations in June 2020 was collected through the Hospital Information System of the Unified Health System (HIS/UHS), available on the platform of the Department of Informatics of the UHS (DATAUHS). The admissions were analyzed according to age, gender, color/race, month of occurrence, and municipality of residence, according to the last ten years of data available.⁹
The data was organized, after the electronic collection, through spreadsheets in Microsoft Excel 2019, analyzing them through descriptive statistics, with absolute and relative frequencies, in the Statistical Package for the Social Science (SPSS), version 20.0, organized in tables and figures containing the number of hospitalizations at national, regional and state levels. The admissions were classified according to their social and demographic characteristics. The proportions of hospitalization per month of occurrence were also identified.

Approval by an ethics committee was waived, as it was a survey elaborated with secondary data aggregates available online, which do not contain confidential information. The entire study was conducted in accordance with the principles of the National Health Council Resolution No. 466/2012.10

RESULTS

Among Brazilian children under five years of age, 612,640 hospitalizations for diarrheal diseases were observed between 2010 and 2019, and in the Northeast region, this number was 254,511 hospitalizations. There were 21,805 hospitalizations in the State of Piauí in the same period. Figure 1 shows the number of hospitalizations in the three spheres over the ten years.

![Figure 1: Hospital admissions for diarrheal diseases in children under five years of age (n=612,640) in Brazil, the Northeast region and the State of Piauí, from 2010 to 2019. Teresina (PI), 2020.](image)

As shown in figure 1, the number of hospitalizations has dropped over the years. At the national level, there was a decrease of almost 50% in the number of hospitalizations until 2019, and at the regional and state levels, this percentage was 38%.

Table 1 below shows the social and demographic characteristics of hospitalizations in the State of Piauí.

<table>
<thead>
<tr>
<th>Year</th>
<th>Hospitalizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>50,000</td>
</tr>
<tr>
<td>2011</td>
<td>75,000</td>
</tr>
<tr>
<td>2012</td>
<td>100,000</td>
</tr>
<tr>
<td>2013</td>
<td>125,000</td>
</tr>
<tr>
<td>2014</td>
<td>150,000</td>
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<tr>
<td>2015</td>
<td>175,000</td>
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<tr>
<td>2016</td>
<td>200,000</td>
</tr>
<tr>
<td>2017</td>
<td>225,000</td>
</tr>
<tr>
<td>2018</td>
<td>250,000</td>
</tr>
<tr>
<td>2019</td>
<td>275,000</td>
</tr>
</tbody>
</table>
Table 1. Social and demographic characteristics of hospitalizations for diarrheal diseases in children under five years of age (n=21,805) in the State of Piauí, Brazil, from 2010 to 2019. Teresina (PI), Brazil, 2020.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Hospitalizations</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Age group (in years)</td>
<td></td>
</tr>
<tr>
<td>0 to 1</td>
<td>5.043</td>
</tr>
<tr>
<td>1 to 4</td>
<td>16.762</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>11.392</td>
</tr>
<tr>
<td>Female</td>
<td>10.413</td>
</tr>
<tr>
<td>Color/race</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>2.111</td>
</tr>
<tr>
<td>Black</td>
<td>167</td>
</tr>
<tr>
<td>Brown</td>
<td>11.443</td>
</tr>
<tr>
<td>Yellow</td>
<td>54</td>
</tr>
<tr>
<td>Indigenous</td>
<td>2</td>
</tr>
<tr>
<td>No information</td>
<td>8.028</td>
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<tr>
<td>Main municipalities</td>
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<td>Picos</td>
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<td>Parnaíba</td>
<td>1.827</td>
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<tr>
<td>Teresina</td>
<td>1.553</td>
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<tr>
<td>Castelo do Piauí</td>
<td>1.006</td>
</tr>
<tr>
<td>Campo Maior</td>
<td>989</td>
</tr>
</tbody>
</table>

Source:9

Table 1 shows that the age group most affected by diarrheal diseases is between one and four years, representing 76.9% of hospital admissions and the most affected gender, representing 52.3%, is the male. The color/race was observed as the most frequent (52.5%) and, among the five cities in the state with the highest number of hospitalizations, the city of Picos occupied the top, with 11.4% of the hospitalizations in Piauí.
Figure 2: Temporal variation of hospitalizations for diarrheal diseases (n=21,805) in children under five years of age in the State of Piauí, Brazil, from 2010 to 2019. Teresina (PI), Brazil, 2020.

Figure 2 shows the total number of cases in the last ten years distributed according to the month of occurrence and, regarding the temporal variation of hospitalizations, the month of January presented the highest number of cases (12% of the total), followed by February, March and September.

It follows that there is a prevalence of cases at the beginning of the year, a time that coincides with the rainy period in the Northeast, and there is still a downward curve after this period, reaching up to June, which coincides with the sun and an upward curve between June and September, followed by variations of fall and rise between September and December.

**DISCUSSION**

In the last ten years (2010 to 2019), it has been occupied by diarrheal diseases, the third place in the causes of hospitalizations of children under five in the State of Piauí, totaling 21,805 cases, second only to hospitalizations for pneumonia and other intestinal infectious diseases. This same scenario was found at the regional level.9

Results are believed to be consistent, with a recent global review of the impact of rotavirus vaccine on hospitalizations and diarrhea deaths in children under five in Asia, with median percentage reductions of 46% in hospitalizations per age in countries.11 The differences between countries are probably due to differences in health seeking behavior and access to basic health services.12

Among the regions of Brazil, in the Northeast, 41% of the hospitalizations for ADD in the country in the last ten years were presented. Diarrheal disease continues to be one of the main problems affecting children in the early years of life, particularly in the less developed regions.13
This high number in the Northeast region is directly related to the social and economic profile of the population, since the high incidence of diarrhea in a region is linked to inefficient basic sanitation, inadequate hygiene, immunization, food preparation, as well as the level of maternal schooling.\textsuperscript{14}

Diarrhea associated with severe dehydration affects mainly children under five years of age; however, in developed countries, infections are more common in children between nine and 15 months of age, while in low-income countries, most infections are detected in children under one year of age.\textsuperscript{15}

According to the data contained in table 1 on the characteristics of hospitalizations, the result found regarding age is in accordance with a study conducted in Minas Gerais in the year 2018, where most of the children affected by diarrhea were between one and four years of age.\textsuperscript{16}

It is pointed out that several factors influence the majority of the cases in this age group: fragility in the child's immune system; inadequate breastfeeding or temporary immunodeficiency due to some viral infection, such as measles.\textsuperscript{8}

It was verified, regarding gender, that there was similarity to a study conducted in Rio Branco (AC) where 53.6% of hospitalized children diagnosed with diarrhea were male\textsuperscript{4} and, regarding race/color, the highest number of hospitalizations of brown children was also observed at the national level.\textsuperscript{9}

Among the months of greater occurrence of hospitalizations for ADD, a survey conducted in the State of Amapá found similar results to this study, in which the month of January registered the highest number of cases of the year, reaching 20% of the total. This period is marked by the occurrence of rains in the North and Northeast regions, which happen from December to May.\textsuperscript{17}

This occurs due to the bacteriological contamination of the surface water table wells, which are used later without adequate treatment. The worsening of the water quality can be related to the run-off of rainwater, carrying human and animal excreta, increasing the frequency of diarrhea in the rainy season.\textsuperscript{4}

Brazil has a great socio-demographic, economic-cultural and health diversity in its different regions, which can contribute to the proliferation of diarrheal diseases. It is added that, due to global climate change and the possibility of extreme weather events, extra care must be given to the consequences for the population's health, mainly because inadequate urbanization conditions, together with precarious advances in basic sanitation, contribute to a characteristic vulnerability picture.\textsuperscript{18}

\textbf{CONCLUSION}
It is warned that hospitalizations for acute diarrheal diseases are a serious health problem in Brazil and the world. This condition is associated to several factors, among them, socio-environmental issues, which favor the transmission of the agents that cause the agravo and the illness of the exposed individuals.

It is known that children under five are a population more vulnerable to acute diarrheal diseases and are responsible for high morbidity and mortality. This study aimed to characterize hospitalizations for ADD of children in this age group in the State of Piauí.

From the analysis of the results, it was concluded that the number of hospital admissions has decreased considerably over the last ten years; however, the Northeast is still one of the most affected regions of the country, responsible for a large percentage of the admissions.

This progeny of the curve was also observed in the State of Piauí, where children between one and four years old and males continue to be the most affected. It was also concluded that it is necessary to adopt extra care during the rainy season, since it is the period with the highest appearance of cases registered in the last decade.

The importance of strengthening the public health of the population, with the improvement of basic sanitation and distribution of treated water, aiming at improving the health of the community and the consequent decrease in the number of hospitalizations of children from Piauí due to diarrheal diseases, is highlighted.

REFERENCES


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