Chapter 265

Epidemiological study of the evolution of the number of cases and the cost of hospitalization due to burns and corrosions in children in brazil (2010 - 2019)

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ABSTRACT
The epidemiological study on burns allows guiding new prevention and care strategies through scientific basis, while analyzing variables that contribute to morbidity and mortality. Objective: The aim of this article is to conduct an epidemiological study about the evolution of the number of cases and the cost of hospitalization for burns and corrosions in children in Brazil from 2010 to 2019. Method: This is a cross-sectional, documentary study and has a quantitative approach, with data comprising epidemiological information of hospital morbidity and mortality and health indicators located in the period from January 2010 to December 2019, which were collected through the SUS Hospital Morbidity Declaration System of DATASUS. Results: The number of notifications for burns and corrosions in children in the period between 2010 and 2019, with a total of 72,177 cases. When comparing the data from 2010 and 2019, there was a 19.02% decrease in the number of cases in the pediatric age group. It is noteworthy that the group of children aged 1 to 4 years represents 63.85% of the total sample. There is a higher percentage of occurrences in males, which represent 60.28% of the sample. The Northeast region had the highest number of cases with 36.5% (26,352 cases) of the sample, while the North region represented only 8.12% (5,865 cases) of the sample. The Southeast region showed the highest mean cost (R$1,935.88), in contrast to the North region, which showed a mean cost of only R$1,227.63. Conclusion: By analyzing the age range in question, one can relate the causes of the occurrence of burns to age-related risk behaviors and propagated cultural values that expose male children more prominently to the dangers. It is worth mentioning that the socioeconomic profile of the regions also interferes in the number of occurrences, notifications and in the investment in material and human resources directed to these services.

Keywords: Burns, Children, Epidemiology.

1 INTRODUCTION

Burns are harmful processes that can affect the most superficial layers of the skin to deeper tissues, such as bones, muscles, tendons, and ligaments1,9.

As for harmful agents, burns can be classified as thermal, chemical, electrical, and radioactive1,3,5,7. As for the degree, there are 1st, 2nd, and 3rd-degree burns. The 1st degree affects the

epidermis, and the 2nd degree affects the epidermis in all its extension and the dermis. On the other hand, 3rd-degree ulcers extend from the most superficial layers of the skin to the subcutaneous cellular tissue and, eventually, may affect other deep tissues depending on the affected region 1,3,4.

Regarding prognosis, factors such as age, presence of associated comorbidities, the affected area, depth, and extent of injuries are important determinants of morbidity and mortality in burned patients 1,4.

The Ministry of Health estimates that around one million people are victims of burns annually, and of these, 10% require hospital care, which implies a major public health problem and, therefore, generates large costs for the system 1,3,4,5.

Children make up an important risk group, they are more curious, and impulsive and still have little discernment to deal with dangerous situations, characteristic of this age group. Scalds, especially in the home environment, are the most frequent type of burn during childhood, with emphasis on individuals younger than 5 years 4,8,9.

There are 56 specialized burn centers in Brazil, but they are not evenly distributed. The North region, for example, does not have specialized units. In addition, material resources and labor are limited and are not always able to meet demands 2.

The epidemiological study on burns allows guiding new prevention and care strategies through the scientific basis while analyzing variables that contribute to morbidity and mortality 2,6. Therefore, the objective of this article is to carry out an epidemiological study on the evolution of the number of cases and the cost of hospitalization for burns and erosions in children in Brazil from 2010 to 2019.

2 METHODOLOGY

This is a cross-sectional, documentary study with a quantitative approach, with data comprising epidemiological information on hospital morbidity and mortality and health indicators from January 2010 to December 2019, which were collected through the Hospital Morbidity Declaration System from SUS from DATASUS1.

The information related to the accumulated inflation in the analyzed period was measured according to the National System of Extended Consumer Price Indexes (IPCA) of the IBGE2.

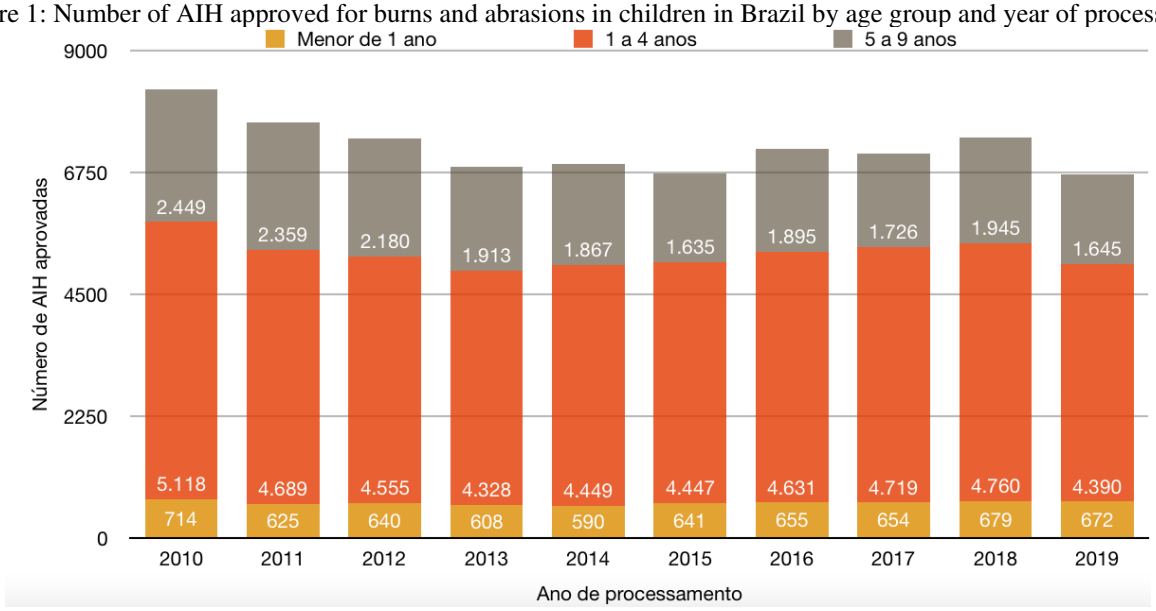
The data collected about hospital morbidity and mortality were researched following the variables necessary for analysis, with a selection of the age group below or equal to 9 years: BURNS AND CORROSIONS (ICD-10 Code: T20-T32). Information was crossed with several variables, taking into account for this group: the number of approved Hospitalization Authorizations (AIH), the average value of AIH, sex, age group, average value transferred by professional service, average value transferred by hospital services and total value transferred by SUS.

Regarding the graphs and tables used in the results, they were prepared using the Pages program (Apple).

3 RESULTS

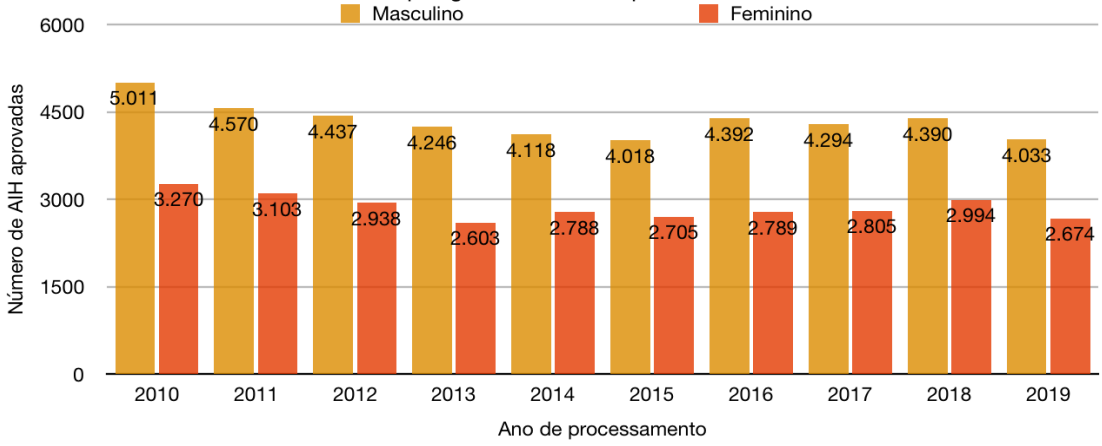
In Figure 1, the graph represents the number of notifications for burns and erosions in children in the period between 2010 and 2019, with a total of 72,177 cases, representing 28.24% of the total number of cases in Brazil, covering all age groups over the same period. When comparing data from 2010 and 2019, a decrease of 19.02% is observed in the number of cases in the pediatric age group. When observing the number of notifications by age group in each year, the group of children aged 1 to 4 years stands out, which made up the majority of cases in all years, in addition to representing 63.85% of the total sample.

Figure 1: Number of AIH approved for burns and abrasions in children in Brazil by age group and year of processing.



Regarding gender, the graph in Figure 2 portrays the number of cases by sex and year of processing. A higher percentage of occurrences in males stands out, which represent 60.28% of the sample. When comparing the 2010 and 2019 notifications, a decrease in the number of cases in both genders is noted, with a decrease of 19.42% in males and 18.23% in females.

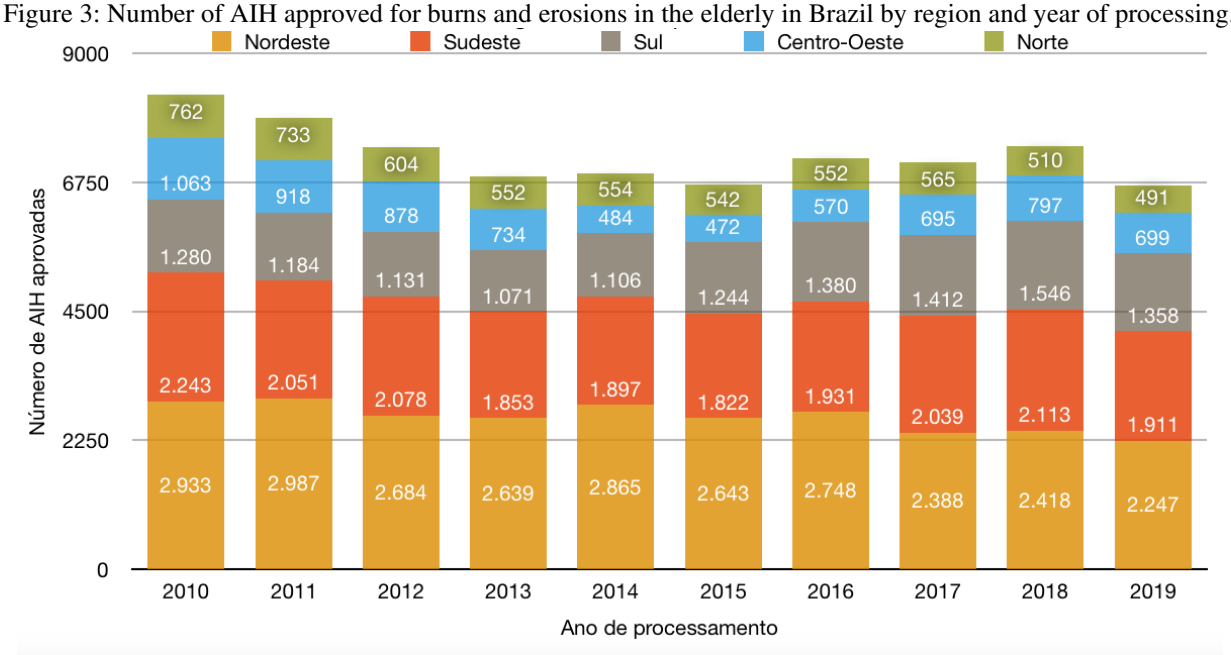
Figure 2: Number of AIH approved for burns and abrasions in children in Brazil by gender and year of processing.



Regarding the distribution of reported cases, the graph in Figure 3 shows the number of occurrences by region of the country and by year of processing. The Northeast region had the highest number of cases with 36.5% (26,352 cases) of the sample, while the North region represented only 8.12% (5,865 cases) of the sample.

Furthermore, all regions showed a decrease in the number of cases, except for the South region, which showed a growth rate of 6.09%. Concerning the decrease in the number of occurrences, the North region stood out with the highest rate of decrease (35.6%), followed by the Midwest region (34.3%), the Northeast region (23.4%), and the Southeast region (14.9%).

Figure 3: Number of AIH approved for burns and erosions in the elderly in Brazil by region and year of processing.



In Table 1, the average value per AIH approved by region of the country for the period studied is highlighted, comparing 2010 and 2019. The Southeast region showed the highest average cost (R$1,935.88), in contrast to the region Norte, which presented an average cost of only R$1,227.63.

Table 1: Mean value (R$) of AIH approved for burns and erosions in children by regions of Brazil for the period from 2010 to 2019.

	2010	2019	The average for the period 2010-2019
North	993,72	1.484,35	1.227,63
North East	1.845,40	1.471,67	1.824,50
Southeast	1.932,61	1.883,48	1.935,88
South	1.798,90	1.814,96	1.849,38
Midwest	1.185,98	1.560,73	1.409,53
BRAZIL (TOTAL)	1.698,82	1.668,75	1.769,12
• *Values in R$.*			

Furthermore, regarding the amounts transferred per hospitalization in the analyzed period, the average amount transferred to hospitals increased from R$ 1,139.81 in 2010 to R$ 1,162.88 in 2019 (an increase of 2.02%), while transfers to professionals of health went from BRL 559.01 in 2010 to BRL 505.87 in 2019 (decrease of 9.6%).

4 DISCUSSION

In short, looking at Figure 1, it is notable that the high number of children affected by burns in Brazil, as well as the oscillation in the number of hospitalizations between 2010 and 2019. From this perspective, it is important to highlight that, in the Child Health Handbook, it is described that as the child grows, curiosity is part of his development, which can cause burn events due to the child's lack of understanding that a certain object can be very hot. Domestic accidents, such as a child dropping a pot of boiled liquid on him, touching an electric iron, or touching hot food are very common. Furthermore, the decrease in the number of cases over the years can be explained by the incentive to provide information about domestic accidents to children, through campaigns and the distribution of information pamphlets, providing parents with knowledge on how to avoid such accidents [11].

Analyzing the chart, it is noted that the most affected population are children aged 1 to 4 years. It is in this age group that pediatricians should be more concerned about advising parents about accident prevention strategies. According to Jean Piaget's stages of cognitive development, this age group encompasses part of the sensorimotor stage, when the child's knowledge of the world is based on the senses and motor skills. At this stage, the child is no longer dependent on the parents and begins to develop the curiosity to explore the elements of the environment in which they are more freely, thus bringing a greater risk of domestic accidents, such as burns and electric shocks. In this age group, the main cause of burns in children, according to the literature, is scalding, so care must be taken not to allow the child to enter the kitchen while preparing meals and avoid handling boiling liquids near the kitchen 10.

In Figure 2, a notable difference is evidenced when we compare the percentage of male and female burn victims. Male children represent more than 60% of cases. This data corroborates the statistics already present in the literature and comes from the difference in behavior and the type of activity performed by both genders. Culturally, in Brazil, boys tend to have more agitated games that bring more risk of physical damage, such as activities that involve running and playing ball indoors [12].

When analyzing the number of cases per region in the country in Figure 3, the Northeast stood out with the highest number of hospitalizations, which may be a reflection of the socioeconomic conditions faced in the region, such as the lower level of knowledge and information that the population receives regarding the prevention of burns and other accidents. Often, small home environments that accommodate a large number of individuals can increase the risk of accidents due to burns and, also, cases in which adults need to go out to work and leave their children alone at home, responsible for household chores 13, 14,16.

Still analyzing the data separated by region, the greatest decrease in the number of cases was evidenced in the North region, as well as the smallest number of registered cases, and these data may be due to underreporting of cases in the region, but we are still faced with low epidemiological evidence of burns by region in the literature 14, 15.

Regarding the average cost of hospitalizations by region shown in Table 1, the Southeast region had the highest average cost and the North region the lowest. This parameter includes the salary of professionals, the cost of materials used, and the amount allocated to the hospital 17.

This data reflects the difference in prices of materials used in dressings for burns and medications since the Southeast region concentrates on the largest health and research centers in the country, which provides greater access to more modern and, consequently, more expensive materials. 17, 18.

Another factor that influences the difference in hospitalization values between the regions is the procedures registered in each health center that demonstrate different quantities and qualities of the materials used 17, 18.

5 CONCLUSION

By analyzing the age group in question, one can relate the causes of burns to risk behaviors typical of age and propagated cultural values that expose male children in a more marked way to dangers. It is worth mentioning that the socioeconomic profile of the regions also interferes with the number of occurrences, notifications, and investment in material and human resources directed to these services.

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