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BURNS ON CHILDREN AND ADOLESCENTS ASSISTED AT A PEDIATRIC EMERGENCY ROOM

QUEIMADURAS EM CRIANÇAS E ADOLESCENTES ATENDIDOS EM UM PRONTO-SOCORRO INFANTIL

QUEMADURAS EN NIÑOS Y ADOLESCENTES ATENDIDOS EN UNA SALA DE EMERGENCIAS PEDIÁTRICAS

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ABSTRACT

Purpose: To characterize the care for burns on children and adolescents at a Pediatric Emergency Room from 2008 to 2018. **Method:** Retrospective and descriptive study with quantitative approach. Data gathered from secondary data on subjects from zero to 14 years old, who were victims of burns, available in medical records and in the hospital system. Descriptive statistical analysis and association were conducted (Pearson's chi-square test $p < 0.05$). **Results:** There were 79 admissions for burns, 64,6% were male. In most cases (62%), children under 5 years of age were involved. On the total analyzed, 62% presented less than 10% of Total Body Surface Area. There had been a predominance of second-degree burns (57%) and scalding (58.2%). **Conclusion:** Second-degree and scalding burns were the most frequent and affected the male sex the most, which reinforces the need for actions of health promotion and prevention of burns involving children and adolescents.

Descriptors: Child; Adolescent; Burns; Emergencies; Pediatric nursing.

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RESUMO
Objetivo: Caracterizar os atendimentos por queimaduras em crianças e adolescentes em um Pronto-Socorro Infantil, no período de 2008 a 2018. **Métodos:** Estudo descritivo e retrospectivo, de abordagem quantitativa. Foram coletados dados secundários de sujeitos de 0 a 14 anos de idade, vítimas de queimaduras, disponíveis em prontuários e no sistema hospitalar. Foram conduzidas análises estatísticas descritiva e de associação (teste Qui-quadrado de Pearson p<0,05). **Resultados:** Identificaram-se 79 admissões por queimaduras, sendo 64,6% do sexo masculino. A maioria dos atendimentos (62%) correspondeu a crianças menores de 5 anos de idade. Do total analisado, 62% tiveram mais de 10% de Superfície Corporal Queimada. Houve predominância de queimaduras de 2.º grau (57%) e escaldaduras (58,2%). **Conclusão:** As queimaduras por escaldaduras e de 2.º grau foram as mais frequentes e acometeram mais o sexo masculino, o que reforça a necessidade de ações de promoção da saúde e prevenção de queimaduras envolvendo crianças e adolescentes.
Descritores: Criança; Adolescente; Queimaduras; Emergências; Enfermagem pediátrica.

RESUMEN
Objetivo: Caracterizar la atención de los casos de quemaduras de niños y adolescentes en una sala de Emergencias Pediátricas de 2008 a 2018. **Método:** Estudio descriptivo y retrospectivo con abordaje cuantitativo. Se recolectaron datos secundarios de sujetos de cero a 14 años de edad, que fueron víctimas de quemaduras, disponibles en las historias clínicas y en el sistema hospitalario. Se realizaron análisis estadístico descriptivo y por asociación (Prueba de chi cuadrado de Pearson p <0,05). **Resultados:** Se identificaron 79 admisiones, el 64,6% era del sexo masculino. La mayoría de las consultas (62%) correspondía a niños con menos de 5 años de edad. Del total analizado, el 62% tenía más del 10% de la Superficie Corporal Quemada. Predominaron las quemaduras de 2º grado (57%) y las escaldaduras (58,2%). **Conclusión:** Las quemaduras de 2º grado y las escaldaduras fueron las más frecuentes y afectaron más al sexo masculino, lo que indica que es necesario tomar acciones para la promoción de la salud y prevención de las quemaduras en niños y adolescentes.
Descriptores: Niño; Adolescente; Quemaduras; Emergencias; Enfermería pediátrica.

INTRODUCTION

Burns consist of injuries to the skin or other organic tissues, resulting from thermal, electrical, chemical or radioactive trauma.[1] Each year, approximately 25,000 child victims of burns are treated in emergencies in England and Wales.[2] In the United States, there were more than 401,000 burn injuries in 2008; and in places such as Colombia, Egypt and Pakistan, 18% of children with burns had permanent disability, with 17% having temporary disability.[3] In Brazil, it is estimated that burn injuries occur in 1 million people each year, and that, among the 100 thousand victims who seek hospital care, 2.5% die as a result of these injuries.[4] Therefore, in the country, burns are a public health problem,

When analyzing mortality due to trauma from burns, among countries, there is a high number of deaths, with an estimated annual value of 180,000, most of which occur in low- and middle-income countries.[5]

In the literature, several Brazilian studies, carried out in different locations of

the country, highlight high numbers of children hospitalized because of burns.[6,7,8] One of them, carried out with the purpose of describing the profile of hospitalizations for acute treatment of burn victims in a Burn Treatment Center (CTQ), in the city of Ribeirão Preto, evidenced the occurrence of 1,568 hospitalizations, of which 26.7% were children and adolescents.[6]

Studies reveal that in Brazil the most common cause of burns in children – regardless of sociodemographic variables – is contact with hot liquid and then directly with the flame.[7,8]

Another study, carried out in Porto Alegre, in the state of Rio Grande do Sul, to analyze the epidemiological characteristics of children hospitalized due to burns, in a pediatric trauma Intensive Care Unit (ICU), identified, in the period of January 2013 to December 2015, 140 cases, most of them due to scalds.[9]

In this way, describing the profile of care as a result of burns in children and adolescents becomes relevant, not only in the sense of characterizing the population affected by this type of external cause of morbidity and mortality, but also in the sense of contributing to the evaluation of a possible need for specific care spaces for burn patients. For example, a Specialized Burn Treatment Center − or at least a specialized treatment team − can contribute beyond the hospital environment, thinking about the care of victims who are already assisted and the follow-up of this care, with regard to prevention of this type of accidents, aiming at the development of educational actions. Therefore, the general objective of this study was to characterize the care for burns in children and adolescents in a Child Emergency Room, from 2008 to 2018, in addition, to evaluate the association between the variables etiologic agent and age group.

METHODS

Descriptive and retrospective study, with a quantitative approach, in which secondary data were reviewed, referring to the care of children and adolescents victims of burns, admitted to a Children's Emergency Room of a public and teaching hospital, located in Triângulo Mineiro. This hospital serves 27 municipalities that make up the macro-region of the Southern Triangle of the state of Minas Gerais, and offers high-complexity care only through the Unified Health System (SUS). It also receives patients from other regions of Minas Gerais and from several Brazilian states, and the Emergency Room is a reference in urgent and emergency hospital care.[10]

For this research, data from children and adolescents aged 0 to 14 years, with the initial diagnosis of burns, who received care at the Children's Emergency Room of the

HC-UFTM/EBSERH, from January 1, 2008, to December 31, 2018, were chosen for this research.. The age group from 0 to 14 years old was established, as it is served in that sector. Information on patients who: did not belong to the established age range were excluded from the study; referred to attendances outside the aforementioned period; and those from medical records with no history of burns in the described period.

The concept of children and adolescents established by the Statute of Children and Adolescents (ECA) was considered, for which a child is every person between 0 and 12 years of age and adolescents are those between 12 and 18 years of age.[11] As a source of information, data compiled by the Information Technology Process Management Sector (SGTI) of the HC-UFTM/EBSERH and medical records from the Medical Archive and Statistics Service (SAME) of that hospital were also used. For the survey of burn victims from 2008 to 2013, records from the current HC System were used, and, for the survey from 2014, records from the Management Application for University Hospitals (AGHU), implemented in the hospital from the said year.

There were identified, from August 23, 2006 to December 20, 2018, 187 burn victims from the survey provided by the SGTI. Of these, 75 were excluded because they were older than the inclusion criterion; 32 because they were victims admitted in years prior to 2008; and one for not having a history of burns described in the chart. Therefore, 79 children and adolescents victims of burns, admitted to the Children's Emergency Room between 2008 and 2018, characterized the sample of this study.

Data were collected using an instrument developed by the researchers. The variables studied were: gender (male or female); birth date; place of residence; place of origin; percentage of burned body surface (% BBS) [<10% and ≥10%]; degree of burns (1st, 2nd and 3rd degrees); etiological agent (scalds, flammable liquids, contact with a hot object or surface, chemical agent, electricity, fire and direct flame); day of the week; opening hours (morning, afternoon, night and dawn); month and year of attendance; outcome (discharge to home and hospitalization); and duration of hospitalization. The age variable was categorized into < 5 years and ≥ 5 years. In addition to this categorization, this variable was ordered according to ages 0 to 14 years.

Data collected by the SGTI were analyzed by four researchers, in order to obtain only those referring to children and adolescents who received care in the described period. The distance from cities to Uberaba was divided into: less than 50km, between 50 and 100, and more than 100km.[12]

The waiver of the Free and Informed Consent Form was requested from the Ethics Committee for Research with Human Beings (CEP), of the HC-UFTM/EBSERH, because they were secondary data and due to the impossibility of requesting authorization to all children and adolescents treated at the Children's Emergency Room of the aforementioned hospital, in the period described, and with a diagnosis of burns.[13] The reasons that made it impossible to request authorization include: the risk of discomfort and stigmatization of the participants when remembering the accident that caused the burn; situations in which the outcome of hospitalization resulted in death; the victim's place of residence is not in the city of Uberaba and/or is outdated (place of residence did not match the place of residence during the study period), thus making it impossible to locate the victim for the application.[13] The waiver was granted and the study was approved (CAAE No 05985018.0.0000.8667).

Data were tabulated in the Microsoft Excel® 2013 program, by double typing and submitted to descriptive statistical analysis, performed using the statistical software Statistical Package for Social Sciences (SPSS®). To assess the association between the etiologic agent and age variables, Pearson's chi-square test was used. The significance level adopted for the test was $p \leq 0.05$.

RESULTS

Of the total number of participants, 64.6% were male. The predominant age group was children under 5 years old (62.02%). The age with the most attendances for burns was 0 to 1 year (39.2%). Regarding the patients' residence, 54.4% were from Uberaba.

As an outcome of care, most patients remained hospitalized (94.9%). No deaths were recorded. The hospitalization days ranged from 0 to 123 days, with a mean of 13 days (SD=20.1; M= 6).

Regarding the classification by burn extension, 62.0% of the patients had a BBS greater than or equal to 10%. The mean BBS was 16.2 (SD = 12.5).

Regarding the classification by depth of burns, 57% suffered 2nd degree burns (Table 1).

Table 1. Sociodemographic characteristics of children and adolescents admitted to the Children's Emergency Room of HC-UFTM/EBSERH, from January 2008 to December 2018 (n=79). Uberaba, MG, Brazil, 2019

Variables	**N**	**(%)**	**Average**	**DP***	**median**	**Minimum**	**Maximum**
Gender							
Male	51	(64.6)					
Female	28	(35.4)					
Aage group	79	(100)					
< 5 years	49	(62.02)					
≥ 5 years	30	(37.98)					
Age			5.0	4.3	3.3	0.09	14.8
0 to 1 year	31	(39.2)					
2 years	5	(6.3)					
3 years	8	(10.1)					
4 years	5	(6.3)					
5 years	3	(3.8)					
6 years	two	(2.5)					
7 years	4	(5.1)					
8 years	4	(5.1)					
Nine years old	3	(3.8)					
10 years	6	(7.6)					
12 years	two	(2.5)					
13 years	two	(2.5)					
14 years	4	(5.1)					
Residence, no information = 1							
Uberaba	43	(54.4)					
Other cities	35	(44.3)					
Origin, no information = 2							
Uberaba	43	(54.4)					
Other cities	34	(43.0)					

*Standard deviation

Source: Secondary data collection in medical records

Table 2. Clinical and accident characteristics of children and adolescents admitted to the Children's Emergency Room of HC-UFTM/EBSERH, from January 2008 to December 2018 (n=79). Uberaba, MG, Brazil, 2019

Variables	N	(%)	Average	DP*	median	Minimum	Maximum
Body surface burned, no information = 9	70	(88.6)	16.2	12.5	12.5	1	67
< 10%	21	(26.6)					
≥ 10%	49	(62.0)					
Burn degree, no information = 4							
2nd degree	45	(57.0)					
1st and 2nd degrees	19	(24.1)					
2nd and 3rd degrees	8	(10.1)					
1st, 2nd and 3rd degrees	3	(3.8)					
Day of the week							
Saturday	19	(24.1)					
Sunday	12	(15.2)					
Wednesday	14	(17.7)					
Tuesday	13	(16.5)					
Monday	8	(10.1)					
Thursday	7	(8.9)					
Friday	6	(7.6)					
Time of accident, no information = 6							
Night	31	(39.2)					
Evening	25	(31.6)					
Dawn	10	(12.7)					
Morning	7	(8.9)					
Outcome							
Discharge to home	4	(5.1)					
Hospitalization	75	(94.9)					
Hospitalization days	75	(94.9)	12.8	20.1	6	0	123

*Standard deviation

Source: Secondary data collection in medical records

Regarding the etiological agent and the classification of burns, more than half were due to scalds (Table 3).

Table 3. Classification distriburion of burns and etiologic agents, according to absolute number and frequency. Uberaba, MG, Brazil, 2019

Classification	Etiological agent	N	%
Scalds	Water	22	27.8
	Oil	15	19.0
	Milk	3	3.8
	Coffee	2	2.5
	Broth	2	2.5
	Unspecified hot liquid	2	2.5
Subtotal		46	58.2
Flammable liquids	Alcohol	9	11.4
	Gasoline	5	6.3
Subtotal		14	17.7
Contact with a hot object or surface	Pressure cooker contents	2	2.5
	Gray	1	1.3
	Oven	1	1.3
	Wood burning stove	1	1.3
	Plastic	1	1.3
	Candle	1	1.3
	Unspecified hot surface	1	1.3
Subtotal		8	10.3
Chemical agent	Fireworks	1	1.3
	Gunpowder	1	1.3
	Chemical or car cleaner	1	1.3
	Homemade soap	1	1.3
Subtotal		4	5.2
Electricity	Electric wire	2	2.5
	TV explosion	1	1.3
Subtotal		3	3.8
Fire	Fire	2	2.5
Direct flame	Direct flame	1	1.3
Information missing from the medical record	Information missing from the medical record	1	1.3
Total		**79**	**100**

Source: Secondary data collection in medical records

The association between the etiological agent and age variables was verified, and no statistically significant difference was identified between them (Pearson's chi-square=11.9; df=6; p= 0.062) (Table 4).

Table 4. Association between the variables etiologic agent and age group. Uberaba, MG, Brazil, 2019

Etiological agent	Age group			*p-value*[*]
	< 5 years	≥ 5 years	Total	
Scald	34 (70.8%)	12 (40.0%)	46 (59.0%)	0.062
Flammable liquids	5 (10.4%)	9 (30.0%)	14 (17.9%)	
Contact with a hot object or surface	5 (10.4%)	3 (10.0%)	8 (10.3%)	
Chemical agent	2 (4.2%)	2 (6.7%)	4 (5.1%)	
Electricity	2 (4.2%)	1 (3.3%)	3 (3.8%)	
Fire	0 (0%)	2 (6.7%)	2 (2.6%)	
Direct flame	0 (0%)	1 (3.3%)	1 (1.3%)	
	48	30	78	

[*]Pearson's chi-square test

Source: Secondary data collection in medical records

DISCUSSION

Data referring to gender and age group are in line with other studies, such as the one carried out in Cuba, to identify the main epidemiological characteristics of children hospitalized for burns, from January 2015 to December 2016, with a predominance of male victims compared to females.[14] This finding may be related to the greater possibility of male children being involved in games with greater chances of risk. Also, due to the fact that, in this age group, children are discovering new things, which arouse curiosity in them, leaving them exposed to the risk of burns, without being aware of them.[14] Another study, carried out in Maceió, in the state of Alagoas, found similar results regarding the age group from 0 to 1 year as the most victimized by burns.

More than half of the burn victims came from Uberaba. Although there is no Burn Treatment Center (CTQ) in this city, the hospital is a reference for care for trauma patients from Uberaba and region, as already presented.[10] Factors such as distance, transport and time to receive care can make it difficult to recovery and have negative repercussions with regard to the outcome of the burn.

Regarding the day of the week and time of care, almost half of the patients were admitted on weekends and at night. A study carried out in two public emergency rooms in the city of São Luís, in the state of Maranhão, found a similar situation regarding the occurrence of burns, on weekends, in almost 50% of the victims.[16] This result may be related both to the fact that on weekends children tend to dedicate themselves more to leisure activities, regarding inadequate parental supervision.[17]

When analyzing the outcome of care, the results of this study are in line with another research carried out in a public

hospital in Maceió, state of Alagoas, to know the causes of burns in children aged 0 to 5 years.[15] In this study, also no deaths were identified, and 5.1% of the victims were discharged home soon after the first consultations.[15]

As for the classification by burn extension, another study, carried out in Uberlândia, state of Minas Gerais, identified a similar situation, in which most burns affected between 10% and 20% of the victims' BBS.[18]

Regarding the depth of the burns, more than half of the victims suffered 2nd degree burns. A similar situation was found in a study to trace the epidemiological profile of children aged 0 to 18 years, treated at the Plastic Surgery and Burns service of the Hospital Universitário Evangélico de Curitiba, in which more than 60% of the population was victimized by burns of second degree.[19]

Most of the children and adolescents in the present study required hospitalization, which denotes the severity of the burns. Similar results were identified in other studies, with an average of 17 days in Ribeirão Preto, state of São Paulo[6], from six to nine days in Maceió, in the state of Alagoas[15]; and an average of 14.5 days of hospitalization in a Hospital Universtity Evangelical of Curitiba (Hospital Universitário Evangélico de Curitiba), state of Paraná.[19]

Regarding the etiological agent, the results of this research are in line with other studies related to the characterization of pediatric burns, such as the one carried out in a municipal hospital in Porto Alegre, state of Rio Grande do Sul, and another in Ribeirão Preto, in the state of São Paulo, which also identified scalds as the main cause of burns.[6,9] The present study did not find an association between the etiological agent and age group (<5 years or ≥5 years of age), which may be related to the sample size. The study presented above showed an association between the occurrence of scalds and the age group between 0 and 3 years of age.[6] This finding may be related to the easy access to the kitchen without adequate supervision, and the fact that in this age group, children are in a phase of curiosity, which exposes them to a higher risk of accidents.[20]

CONCLUSION

The majority of children and adolescents treated during the period were male, under 5 years of age, with 2nd degree burns and BBS greater than 10%, with scalds being the predominant etiologic agent. Most victims required hospitalization, and no deaths were recorded.

Studies such as this one contribute to the planning and implementation of measures and actions to promote health and

prevent burns, involving children and adolescents, since educational prevention campaigns can be directed to the most frequent types of burns that occur in the cities in question.

The present research has, as limitations, the sample size, the need for manual collection and the non-integration of the HC/UFTM and AGHU databases, before and after 2014. During data collection, there was a lack of adequate record of the etiological agent in the medical record, which is fundamental for the treatment of burns, as each type has a different approach.

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