EPIDEMIOLOGICAL PROFILE OF CHILDREN VICTIMS OF BURNS ATTENDED IN A REFERENCE HOSPITAL IN THE AMAZON

Perfil epidemiológico de crianças vítimas de queimaduras atendidas em hospital de referência na Amazônia

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ABSTRACT

Background: Burns represent a traumatic situation in children. Such trauma is experienced after hospital discharge, when the child finds it difficult to interact in his social and family environment. Information is the most effective way to reduce the consequences generated by the burn. Objectives: To trace the epidemiological profile of children victims of burns who enter a referral hospital in the Amazon. Methods: This study was retrospective, descriptive, observational, cross-sectional and documentary, of a quantitative nature, carried out through analyzes in hospital records, from January 2016 to December 2018. Results: Of the 403 records analyzed, the gender male stood out with 237 (59%) and female 166 (41%); the burned body surface index was 0 to 10% with 210 (52%); the burn depth was 2nd degree, with 370 (92%) of the total cases; medical drug treatment, tramadol as the most used 180 (53%). As for clinical treatment with intervention, debridement indicated a higher prevalence 340 (84%) of cases. In physical therapy treatment, 255 (63%) did not undergo any type of physical therapy intervention, 389 (97%) did not present any complications during hospitalization. Conclusions: Studies to date are scarce with specific and detailed data on the subject, so that effective intervention strategies are provided in order to reduce this trauma in children, especially in the most prevalent age group of this study.

Keywords: Burns; Child; Burnt units; Epidemiology.

RESUMO

Introdução: As queimaduras representam uma situação traumática em crianças. Tal trauma é vivenciado após a alta hospitalar, quando a criança encontra dificuldades para interagir em seu ambiente social e familiar. A informação é a forma mais eficaz de reduzir as consequências geradas pela queima. Objetivos: Traçar o perfil epidemiológico de crianças vítimas de queimaduras que ingressam em hospital de referência na Amazônia. Métodos: O estudo foi retrospectivo, descritivo, observacional, transversal e documental, de natureza quantitativa, realizado por meio de análises em prontuários hospitalares, no período de janeiro de 2016 a dezembro de 2018. Resultados: Dos 403 prontuários analisados, destacou-se o gênero masculino com 237 (59%) e feminino 166 (41%); o índice de superfície corporal queimada foi de 0 a 10% com 210 (52%); a profundidade da queimadura foi de 2º grau, com 370 (92%) do total de casos; tratamento medicamentoso, tramadol como o mais utilizado 180 (53%). Quanto ao tratamento clínico com intervenção, o desbridamento indicou maior prevalência 340 (84%) dos casos. No tratamento fisioterapêutico, 255 (63%) não realizaram nenhum tipo de intervenção fisioterapêutica, 389 (97%) não apresentaram complicações durante a internação. Conclusões: Até o momento são escassos os estudos com dados específicos e detalhados sobre o assunto, de forma que estratégias eficazes de intervenção sejam fornecidas a fim de diminuir esse trauma em crianças, principalmente na faixa etária mais prevalente deste estudo.

Palavras-chave: Queimaduras; Crianças; Unidades de queimados; Epidemiologia

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INTRODUCTION

Burns are injuries resulting from aggressive agents such as thermal, chemical, biological, electrical, radioactive, friction or friction, capable of damaging body tissues, causing partial or total destruction of the skin and attachments, reaching deeper layers, many cases in loss of limbs and consequently leading the individual to death^{1,2}.

Studies show that children are more prone to accidents. In this, the child is in his developmental period, where he is curious, restless, inexperienced, explorer, active and, most of the time, unable to identify and assess the danger, where such carelessness becomes susceptible and facilitated to accidents².

In a study by other authors³, it was estimated that the number of burns per year in the world exceeds the range of 24 million people and of these, about 11 million required medical attention and intervention for burn care.

According to data from the Ministry of Health in 2012, it is estimated that in Brazil there are around 1,000,000 incidents of burns per year, with 100,000 patients seeking hospital care and, of these, about 2,500 patients die directly or indirectly due to their injuries⁴.

In turn, the northern region of Brazil has lower statistical numbers in relation to burns. The State of Pará, located in the northern region, has the worst indicators in relation to

the subject¹. In a study, it was indicated that in 2010, 21,472 hospitalizations were recorded across Brazil and of these, a total of 313 cases died¹.

Therefore, some authors¹ consider that there is little research on such knowledge across the country on children victims of burns and the severity of a traumatic injury resulting from it.

Objectives

Given the above, the objective of this study was to trace the epidemiological profile of children victims of burns who enter a referral hospital in the Amazon in the last 3 years.

METHOD

The research was conducted on 403 medical records of children filed at the Metropolitan Hospital de Urgência e Emergência (HMUE) in Ananindeua, Pará, Northern Brazil (Figure 1). This municipality has a population of 516,057 inhabitants, with a territorial area of 190,451 km² and a demographic density of 2.4 inhabitants / km². Ananindeua has the first public hospital for trauma and burns in the northern region of Brazil, in addition to meeting patient safety criteria in all hospital activities, encompassing care and structural aspects. Hospital visits were carried out from July to October 2019.

The methodological path consisted of qualitative and quantitative research. The first was exploratory in nature, with bibliographic, descriptive, observational, cross-sectional and documentary research as the basic procedures for its execution, being carried out through analyzes in hospital records files. Qualitative research requires fundamental attitudes of openness, flexibility, the ability to observe and interact with the group of researchers and with the social actors involved.

Guiding questions (questionnaire), prepared by the authors, were used to collect data in a public hospital, which covered the following clinical and epidemiological themes, such as: a) year of first hospitalization, b) age, c) sex, d) origin, e) causal agent, f) burned body surface, g) depth, h) length of stay, i) clinical and physiotherapeutic treatment and j) complications. This method is important in order to obtain information about a certain subject, through an investigation.

The medical records of children from 0 to 12 years old, both sexes, attended at the HMUE, from January 2016 to December 2018, with a clinical picture of burns were included in the research. The medical records of patients called for elective surgeries, who suffered rehospitalizations or who were hospitalized with other diagnoses were excluded from the research, in addition to medical records with insufficient information or outside the filing service.

The identities of the participants were kept confidential, guaranteeing their anonymity and confidentiality of the information. This study was carried out according to the precepts of the Declaration of Helsinki and the Nuremberg code, respecting the Research Norms Involving Humans (466/12 and 580/18) of the National Health Council. This study was approved by the Ethics Committee in Research by Instituto Campinense de Ensino Superior LTDA, registration number 3.381.739.

The collected data were stored in a database in Microsoft Office Excel 2010. Subsequently, they were grouped and tabulated, for analysis in the BioEstat 5.3 program. Descriptive statistics was performed, represented by graphs and tables, with dispersion measures such as mean, variance and standard deviation.

RESULTS

Table 1 shows the age groups of burned children admitted to the HMUE in the years 2016 and 2017, with the age group below 1 year of age showing the highest percentages (38 and 37%), respectively. For 2018 (45%) of the children burned are in the age group of 2 to 5 years.

Children hospitalized at the HMUE in relation to gender showed that the male sex represents a greater number with 237 (59%), being representative according to the

years studied. In the present study, 159 (39%) children were transferred from municipal hospitals in the metropolitan region of Belém and inland (Irituia, Bragança, Abaetetuba, Breves and Belém), followed by the Emergency Unit (UPA) in the municipalities of Castanhal, Marituba, Barcarena, Ananindeua and Icoaraci District, with 109 (27%). We observed that the highest index of body surface burned was from 0 to 10% with 210 (52%) and the depth of the burns was 2nd degree, with 370 (92%) of the total cases.

Regarding medical drug treatment, tramadol is the most used by burn victim children, with 180 (53%). As for clinical treatment with intervention, debridement indicated a higher prevalence with 340 (84%) of the cases. Regarding physical therapy treatment, it was found that the vast majority of children burned 255 (63%) did not perform any type of physical therapy intervention, however, the assessment 50 (13%) and active kinesiotherapy 49 (12%) represented small data, total of 389 burned children (97%) did not present complications during hospitalization (Table 2).

Figure 2 represents the causal agent present in child victims of burns. We observed a predominance of scalding liquid in 287 (71%), followed by a direct flame in 83 (21%) of the total cases.

In our research, there was an alternation in the length of hospital stay of burned children, according to the years investigated

(Table 3). The year 2016 presented the highest index from 0 to 5 days, with 61 (44%), followed in 2017 from 6 to 10 days, with 62 (40%) and 2018 from 11 to 20 days, represented by 40 (37%) of the total cases.

DISCUSSION

Children lead in the vast majority of epidemiological studies of literature worldwide, this is due to the greater degree of motor autonomy associated with the lack of awareness of cause and effect relationships, which can make the occurrence of these diseases easier⁵.

Children in the age group under 1 year old represent the largest population among the other ages studied in the years 2016 and 2017, where in 2018 the largest age group affected is children from 2 to 5 years old, with this amount being practically almost half of the total sample. The large increase in incidence and prevalence at this age are justified by the fact that children begin to physically explore the environment in which they are present, with their motor skills surpassing cognitive skills⁶.

Similar results described the predominance of the male gender in burnt children, where such a predominance of male burnt children may be related to the differences in behavior of each gender⁵. This can be explained by traditions that grant boys more

freedom of movement, thus increasing their susceptibility to being exposed to different agents that can burn⁶.

In the present study, many children attended at the HMUE are from the interior of the state of Pará. Similar results were reported by authors⁷, who point out that in São Paulo children also come from the countryside and have relatives in the capital, which facilitates care. In this conception, it can be seen that patients referred from other hospitals and / or UPA are more frequent with regard to screening and referral. With that, it was noticed that in addition to the services provided to burned patients, in Brazil there is still a lack in the provision of specialized services aimed at burn victim children, in the interior of the states.

In the present study, it was found that about 210 (52%) obtained 0 to 10% of SCQ, a fact that may have contributed to the non-worsening of the clinical picture and death. The size of the Burned Body Surface (SCQ) is also a prognostic factor and determines whether the patient is a small, medium or large burn⁸, where some authors also show that SCQ is a variable that affects the patient's outcome⁹.

Historically, to classify the depth of the burn, surgeons relied on the visual assessment of the physical characteristics of the burn surface¹⁰. The survey identified that 370 (92%) of the victims had only 2nd degree burns, while the remainder had 1st degree burns 15 (4%)

and 3rd degree 18 (4%). Other authors have shown similar results, as well as in the research of ^{2,8,11}.

Overall, 53% of the burned children received tramadol (opiate), 33% received dipyrone (analgesic) and 10% received some type of antibiotic (oxacillin and / or amikacin) during treatment. Clinical drug treatment is a component of fundamental importance in the acute treatment of burns, and differences in prescription patterns can provide information on best treatment practices¹².

Of the burns reported in this study, the scorching liquid represented more than two thirds of the data collected (71%), followed by direct flame burns (21%). Corroborating with the study¹³ state that the agents that cause burns in children are directly linked to pediatric age, games are very common, just as at these ages these patients usually seek their parents or another family member and often stumble when adults carry containers with some type of hot liquid and accidentally spilled on them, causing the burn to occur. In studies carried out by other authors on the subject, it was found that the main cause was scalding, probably causing partial superficial thickness lesions, where debridement was necessary in burned patients, in which a large percentage of burned children needed to receive skin grafting somewhere on the body⁷.

Currently, the treatment of burns, with regard to the significant reduction in mortality

and shorter hospital stay, is related to the early excision of burn wounds, where in addition to debridement, grafting is very common in burns of greater severity^{14,15}.

The rehabilitation must be early, progressive and uninterrupted throughout the evolution of the treatment process of this child victim of burn, where the planning must begin at the moment of the initial evaluation of the patient by the plastic surgeon together with the multidisciplinary team involved in the rehabilitation treatment and must be individualized, since the goals of rehabilitation treatment will change over the course of the burn¹⁵.

In the present study, it was found that the vast majority of children burned in the analyzed period 255 (63%) did not perform any type of assessment or physical therapy intervention; Physiotherapy in burn patients has the main objective of preventing limitation of functionality, minimizing and avoiding deformities, preventing the reduction of muscle and tissue composition of the affected segment⁴.

Physiotherapy acts on all the consequences of the burn, not only in kinesiotherapy, but also in cardiorespiratory rehabilitation, with excellent results for the recovery of the burned patient⁵. The evaluation is of fundamental importance with this study, we observed that a very low number went through only the evaluation of

the Physiotherapy sector, another amount performed active kinesiotherapy and breathing exercises.

Authors also emphasize¹⁶ that Physiotherapy is of great importance, in which, by means of various approaches, the physiotherapist acts on the motor, respiratory and healing aspects, thereby improving the quality of life and the sequelae left by the injuries.

When referring to pulmonary complications¹⁷, they reported that they are numerous, so the performance of Physiotherapy must be early and continuous, using resources of bronchial hygiene, pulmonary reexpansion, and ventilatory support if necessary, from the hospitalization phase to discharge, being represented in the study only 21 (5%) of the total number of children burned in the period underwent this type of physical therapy intervention.

Regarding the complications generated, the present study showed that almost all did not present any complications. Consequences resulting from this type of trauma may involve, in addition to psychological repercussions, damage to the respiratory, immune and cardiovascular systems, impaired renal function, usually associated with hypovolemia, hypotension, increased heart rate and shock, and risk of infection followed by septicemia⁴.

Such aggression generates a compromise that causes several physical disorders such as,

for example, loss of liquid volume, metabolic changes, bodily deformities and risk of infection, in addition to the complications resulting from the burn, which can cause major complications in the patient's health status, generating therefore, a high death rate involved in these disorders¹⁸.

Regarding the length of hospital stay, the variables according to the years, the general average of the survey was 8.01 days of hospitalization, a fact that can be correlated to the burned body surface and depth. Similar studies show that the average length of hospital stay was 20.5 days, and this is probably related to the admission of less severe patients, since the reference unit in burns is the only reference service in the State of Rio Grande do Sul for the care of pediatric burns^{6,19}.

CONCLUSION

The occurrence of burns in children should be evaluated with greater attention, as the data and results obtained during the treatment process, provides statistical data for professionals who work with children who are victims of burns, in the pediatric sector.

The epidemiological data presented in this study, as well as some results similar to those described in specific literature already published, will serve as a guide to be able to list possible treatment measures, for example, physical therapy treatment, as well as the

adoption of public policies in which, mainly for patients coming from the countryside, since they need to continue treatment and often do not have the resources to remain in the capital, such measures will help in the knowledge and prevention of these damages.

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OBSERVAÇÃO: Os autores declaram não existir conflitos de interesse de qualquer natureza.

Figure 1: Location map of the municipality of Ananindeua, Pará, Brazil. Source: Research authors (2019).

Table 1: Age group of children victims of burns from the years 2016 to 2018, attended at the Metropolitan Hospital of Urgency and Emergency, Ananindeua, Pará, Brazil.

Age group	Period analyzed 2016							
	Absolute frequency (N)	Relative frequency (%)	Minimum value	Maximum value	Variance	Mean	Standard deviation	Coefficient of variation (%)
Less than 1 year	53	38	0,1	1	0,03	0,96	0,16	16,89
2 - 5 years	51	37	2	5	1,0	2,8	1,0	35,06
6 - 10 years	30	21	6	10	1,4	8,2	1,2	14,65
Older than 11 years	6	4	11	12	0,3	11,8	0,5	4,26
Age group	Period analyzed 2017							
	Absolute frequency (N)	Relative frequency (%)	Minimum value	Maximum value	Variance	Mean	Standard deviation	Coefficient of variation (%)
Less than 1 year	57	37	0,1	1	0,04	0,94	0,21	22,26
2 - 5 years	56	36	2	5	1,1	2,8	1,0	37,08
6 - 10 years	28	18	6	10	2,0	8,0	1,4	17,68
Older than 11 years	14	9	11	12	0,3	11,6	0,5	4,34
Age group	Period analyzed 2018							
	Absolute frequency (N)	Relative frequency (%)	Minimum value	Maximum value	Variance	Mean	Standard deviation	Coefficient of variation (%)
Less than 1 year	34	31	0,6	1	0,03	0,95	0,17	18,31
2 - 5 years	49	45	2	5	1,0	3,0	1,0	34,12
6 - 10 years	19	18	6	10	1,4	7,8	1,2	15,15
Older than 11 years	6	6	11	12	0,3	11,6	0,5	4,45

Source: Field research, 2019.**Table 2:** Epidemiological data of children victims of burns from the years 2016 to 2018, seen at the Metropolitan Hospital of Urgency and Emergency, Ananindeua, Pará, Brazil.

Categories	Total sampled		Period analyzed					
			2016		2017		2018	
	Absolute frequency (N)	Relative frequency (%)	Absolute frequency (N)	Relative frequency (%)	Absolute frequency (N)	Relative frequency (%)	Absolute frequency (N)	Relative frequency (%)
Gender								
Male	237	59	80	57	96	62	61	56
Feminine	166	41	60	53	59	38	47	44
Origin								
Hospital	159	39	63	45	55	35	41	38
Upa	109	27	32	23	52	34	25	23
UBS	91	23	34	24	26	17	31	29
Residence	44	11	11	8	22	14	11	10
Burnt Body Surface								
0 - 10%	210	52	81	58	85	55	44	41
11 - 20%	131	33	44	31	48	31	39	36
21 - 30%	37	9	6	4	14	9	17	16
31 - 40%	15	4	7	5	5	3	3	3
Bigger than 41%	10	2	2	2	3	2	5	4
Depth								
1st Degree	15	4	11	8	4	3	0	0
2nd degree	370	92	123	88	144	93	103	95
3rd Degree	18	4	6	4	7	4	5	5
Clinical treatment (medication)								
Dipyrone	113	33	42	30	53	34	18	16
Tramadol	180	53	81	58	91	59	72	67
Loratadine	8	2	4	3	1	5	3	3
Paracetamol	7	2	3	2	2	1	1	1
Others	32	10	10	7	8	1	14	13
Clinical treatment (intervention)								
Graft	47	12	17	12	23	15	7	6
Debridement	340	84	119	85	123	79	98	91
Plastic surgery	16	4	4	3	9	6	3	3
Physiotherapeutic Treatment								
Did not perform	255	63	107	76	104	67	44	41
Evaluation	50	13	5	4	17	11	28	26
Active kinesiotherapy	49	12	13	9	12	8	24	22
Passive kinesiotherapy	28	7	10	7	13	8	5	5
Breathing exercises	21	5	5	4	9	6	7	6
Complications								
There were no complications	389	97	137	98	150	97	102	94
There were complications	14	3	3	2	5	3	6	6

Source: Field research, 2019.

Figure 2: Causal agent in child victims of burns from the years 2016 to 2018, attended at the Metropolitan Hospital of Urgency and Emergency, Ananindeua, Pará, Brazil. **Source:** Field research, 2019.

Table 3: Data referring to the length of hospital stay of child burn victims from the years 2016 to 2018, seen at the Metropolitan Hospital of Urgency and Emergency, Ananindeua, Pará, Brazil.

Period analyzed 2016								
Length of hospital stay	Absolute frequency (N)	Relative frequency (%)	Minimum value	Maximum value	Variance	Mean	Standard deviation	Coefficient of variation (%)
0 - 5 days	61	44	1	5	1,9	3,3	1,4	42,33
6 - 10 days	54	39	6	10	1,9	8,1	1,4	16,90
11 - 20 days	21	15	11	19	2,6	12,4	1,6	12,96
21 - 30 days	2	1	22	26	4,5	24,5	2,1	8,66
More than 31 days	2	1	33	37	8,0	35,0	2,8	8,08
Period analyzed 2017								
0 - 5 days	46	30	1	5	1,8	2,9	1,3	45,88
6 - 10 days	62	40	6	10	2,1	7,7	1,5	19,03
11 - 20 days	34	22	11	19	8,1	13,8	2,8	20,66
21 - 30 days	7	4	22	26	14,2	25,2	3,8	14,96
More than 31 days	6	4	36	39	4,5	37,5	2,1	5,66
Period analyzed 2018								
0 - 5 days	26	24	1	5	1,8	3,5	1,4	39,28
6 - 10 days	36	33	6	10	1,8	8,3	1,4	16,24
11 - 20 days	40	37	11	15	7,5	15,0	2,7	18,26
21 - 30 days	4	4	23	26	8,3	24,3	2,9	11,86
More than 31 days	2	2	35	47	72,0	41,0	8,5	20,70

Source: Field research, 2019.