



# Evaluation of the epidemiological profile of adult burned patients hospitalized in a referral center in the interior of the state of Bahia, Brazil

*Avaliação do perfil epidemiológico de pacientes adultos queimados internados em um centro de referência no interior do estado da Bahia, Brasil*

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## ■ ABSTRACT

**Introduction:** Burns are skin lesions caused by heat, with different agents that can compromise muscle tissue, tendons, bones and bring risks of loss of limbs, function or even death of the patient. These are problems that can result in clinical, physical and psychological damage. The objective is to evaluate the epidemiological profile of adult patients admitted to a burn treatment center in the Recôncavo da Bahia over 13 months. **Methods:** A retrospective descriptive study evaluated patients' medical records admitted to the institution in question. **Results:** In the period in question, 102 adult patients were admitted, with a balance between the male and female sexes. When analyzing the reason for the burn, it can be seen that the majority had burns of an accidental nature. Scalding by hot liquids, including milk, coffee and oil at high temperatures, was the main agent, with 68 cases (66.7%). As for the depth of the injuries, 83 (81.4%) were victims of 2nd-degree burns, 17 (16.7%) of 3rd-degree and 2 (2%) with wound depth not specified in the records. Regarding the outcome, 96 (94.1%) were discharged from the hospital, 3 (2.9%) died, and 3 (2.9%) were transferred to another service. **Conclusion:** Burns are preventable, so epidemiological data are tools that contribute to the development of care and prevention aimed at this group. This study may serve to plan public health policies to care for and prevent burns.

**Keywords:** Burns; Patients; Epidemiology; Accident Prevention; Public health policies.

## ■ RESUMO

**Introdução:** As queimaduras são lesões cutâneas causadas pelo calor, tendo aquelas diversos agentes, que podem comprometer tecido muscular, tendões, ossos e trazem riscos de perda de membros, de função ou até a morte do paciente. São problemas que podem resultar em danos clínicos, físicos e psicológicos. O objetivo é avaliar o perfil epidemiológico dos pacientes adultos internados em um centro de tratamento de queimados no Recôncavo da Bahia, no período de 13 meses. **Métodos:** Estudo descritivo retrospectivo, no qual foram avaliados os prontuários médicos dos pacientes internados na instituição em questão. **Resultados:** No período em questão, foram admitidos 102 pacientes adultos, existindo um equilíbrio entre os sexos masculino e feminino. Ao analisar o motivo da queimadura, pode-se observar que a maioria apresentava queimaduras de natureza accidental. A escaldadura por líquidos quentes, englobando leite, café e óleo em altas temperaturas, foi o principal agente, com 68 casos (66,7%). Quanto à profundidade das lesões, 83 (81,4%) foram vítimas de queimaduras de 2º grau, 17 (16,7%) de 3º grau e 2 (2%) com profundidade da lesão não especificada nos registros. Com relação ao desfecho, 96 (94,1%) receberam alta hospitalar, 3 (2,9%) foram a óbito e 3 (2,9%) foram transferidos para outro serviço. **Conclusão:** A queimadura é um mal evitável, sendo assim, os dados epidemiológicos são ferramentas que contribuem para a elaboração de cuidados e de prevenção voltados para esse grupo. Este estudo poderá servir no planejamento de políticas públicas de saúde voltadas para o atendimento e prevenção a queimaduras.

**Descritores:** Queimaduras; Pacientes; Epidemiologia; Prevenção de acidentes; Políticas públicas de saúde.

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## INTRODUCTION

Burns are skin lesions caused by heat, with different agents that can compromise muscle tissue, tendons, bones and bring risks of loss of limbs, function or even death of the patient. These are problems that can result in clinical, physical and psychological damage. Treatments involve interruption of the burn, electrolyte replacement, rehydration, pain management, debridement and grafts<sup>1</sup>.

Burns is a set of injuries that cause injury to organic tissue and are caused by an external agent, resulting from the trauma of thermal, chemical, electrical, friction or radiation, leading to the partial or total destruction of the skin and adjacent tissues<sup>2</sup>.

This type of trauma can imply, in addition to psychological repercussions, damage to the respiratory, immune, cardiovascular and renal systems, and the risk of infection followed by sepsis, considered the main cause of mortality<sup>3</sup>.

According to the World Health Organization, burns are the fourth most common type of trauma globally, second only to interpersonal violence, falls and traffic accidents<sup>2</sup>. However, despite being a traumatic entity quite present in all social groups, burns have become one of the main causes of morbidity and mortality in low- and middle-income countries, such as Brazil<sup>4</sup>.

In Brazil, it is estimated that one million individuals are burned each year, with no restrictions on sex, age or race, with a strong economic impact, given the prolonged treatment time<sup>5</sup> and the burden inherent to the disease<sup>6</sup>.

Burns, therefore, is an important public health problem in Brazil, being costly to the health system, and requiring long-term follow-up of the patient to deal with possible psychological and physical consequences arising from the incident<sup>7,8</sup>.

## OBJECTIVE

To evaluate the epidemiological profile of adult patients admitted to a burn treatment center in the Recôncavo da Bahia, from June 2019 to June 2020.

## METHODS

This is a retrospective descriptive study. For the present study, the medical records of patients admitted to the Burn Treatment Unit of the Santo Antônio de Jesus Regional Hospital were evaluated from June 2019 to June 2020. The following variables were considered: gender; age; period of internment; procedures performed and the number of procedures; existence or not of complications; burned body area; causal agent of the burn; patient's origin; burn date;

date of admission; burned region; reason for the burn (accidental, aggression or self-extinction); degree of burns; ICU indication; comorbidities and deaths. The medical records of patients under 18 years of age or who were not admitted to the Burn Treatment Unit were excluded from the present study,

In order to protect the physical and psychological integrity of those involved, assuring them of ethical standards, respecting the Declaration of Helsinki (2000) and the National Health Council - resolution 196/96, this project was submitted to the Ethics Committee in Research (CEP) of the Health Sciences Center (CCS) of the Federal University of Recôncavo da Bahia (UFRB) after the signature of a letter of consent by the Hospital board and data collection was only started after approval by the CEP, under CAAE number 31216820.9.0000.0056.

During data analysis, information from the research participants was cross-referenced, and the frequency and mean of the variables were calculated. Data such as age group<sup>4</sup>, body surface area burned (BBS)<sup>9</sup> and length of stay<sup>10</sup> were grouped according to the theoretical framework present in the literature.

## RESULTS

In the 13 months analyzed at the Burn Treatment Unit, 102 adult patients were admitted, whose epidemiological data were summarized in Table 1.

**Table 1.** Epidemiological profile.

|               |                         | n  | %    |
|---------------|-------------------------|----|------|
| Sex           | Masculine               | 51 | 50.0 |
|               | Feminine                | 51 | 50.0 |
| Comorbidities | Present                 | 28 | 27.5 |
|               | Absent                  | 74 | 72.5 |
| Age group     | 18-25                   | 22 | 21.6 |
|               | 26-40                   | 31 | 30.4 |
|               | 41-55                   | 33 | 32.4 |
|               | 56-65                   | 9  | 8.8  |
|               | 66+                     | 7  | 6.9  |
| Burn degree   | 2 <sup>nd</sup> -degree | 83 | 81.4 |
|               | 3 <sup>rd</sup> -degree | 17 | 16.7 |
|               | Not registered          | 2  | 2.0  |
| BBS           | 0-10%                   | 62 | 60.8 |
|               | 11-20%                  | 15 | 14.7 |
|               | 21-30%                  | 2  | 2.0  |
|               | >31%                    | 3  | 2.9  |
| Cause of burn | Accident                | 92 | 90.2 |
|               | Aggression              | 6  | 5.9  |
|               | Self-extinction         | 2  | 2.0  |
|               | Not registered          | 2  | 2.0  |

BBS: Burned Body Surface

There was a balance between male and female and, of the 102 hospitalized patients, most did not have comorbidities.

When analyzing the reason for the burn, whether of an accidental nature, aggression or self-extinction, it can be observed that the majority had burns of an accidental nature.

In addition, several causal agents of burns were observed. Scalding by hot liquids, including milk, coffee and oil at high temperatures, was the main agent, with 68 cases (66.7%). The second cause was direct contact with a flame, corresponding to 18 cases (17.6%). Four patients (3.9%) were victims of electrical burns. Four patients with unspecified burns were registered, representing 3.9% of the sample.

When looking at the time elapsed between the accident and admission to the burn center, it can be seen that 55 patients (53.9%) took up to 5 days to seek care, while 3 (2.9%) delayed up to 16 days or most.

As for the depth of the injuries, 83 (81.4%) were victims of 2nd-degree burns, 17 (16.7%) of 3rd-degree and 2 (2%) with wound depth not specified in the records. The records of the affected body regions were present in 100 medical records, with the lower limbs being the most affected, with 24.5% of the cases; followed by the upper limbs, with 19.6%; head and neck, with 16.7%; and multiple lesions, with 15.7%.

The most prevalent BBS was up to 10%, found in 62 patients (60.8%). Twenty patients had their BBS missing from the medical records.

As for the procedures performed, all patients in the sample underwent surgical debridement, 68 patients underwent debridement only (66.7%), 32 underwent debridement and grafting (31.4%), and 2 patients (2%) underwent grafting and retail.

Regarding the length of stay, 30 patients stayed 16 days or more in the hospital (29.4%), and 29 patients stayed up to 5 days.

Regarding the outcome, 96 (94.1%) were discharged from the hospital, 3 (2.9%) died, and 3 (2.9%) were transferred to another service. Regarding the ICU indication, 4 (3.9%) patients had an established indication, while 98 (96.1%) were treated in common ward beds.

**Table 4.** Length of hospital stay by burnt body surface indices.

|                           | length of stay |                       |                        |                 |
|---------------------------|----------------|-----------------------|------------------------|-----------------|
|                           | Up to 5 days   | Between 6 and 10 days | Between 11 and 15 days | 16 days or more |
| Up to 20%                 | 20             | 11                    | 17                     | 14              |
| From 11 to 20%            | 1              | 0                     | 4                      | 10              |
| <b>BBS</b> From 21 to 30% | 1              | 0                     | 0                      | 1               |
| More than 30%             | 2              | 1                     | 0                      | 0               |
| <b>TOTAL</b>              | 24             | 12                    | 21                     | 25              |

BBS: Burned Body Surface

When analyzing the overall mortality of patients, the result is 3 deaths (2.9%). Of all hospitalized patients, 12 (11.8%) had complications in their treatment, and 87 (85.3%) did not.

When comparing comorbidities with deaths (Table 2), it is observed that, of the three deaths that occurred, 66% had no comorbidities.

When comparing deaths with complications (Table 3), it can be seen that most patients had no complications and did not die.

It can be seen that, when comparing BBS with the length of hospital stay (Table 4), there was a certain balance in the period spent in the hospital environment.

**Table 2.** Deaths due to the presence of comorbidities.

|                                  |              | Deaths |    |
|----------------------------------|--------------|--------|----|
|                                  |              | Yes    | No |
| <b>Presence of comorbidities</b> | Yes          | 1      | 27 |
|                                  | No           | 2      | 72 |
|                                  | <b>TOTAL</b> | 3      | 99 |

**Table 3.** Deaths due to the presence of complications.

|                                  |              | Deaths |    |
|----------------------------------|--------------|--------|----|
|                                  |              | Yes    | No |
| <b>Presence of complications</b> | Yes          | 3      | 10 |
|                                  | No           | 0      | 89 |
|                                  | <b>TOTAL</b> | 3      | 99 |

## DISCUSSION

According to the Ministry of Health, there were 966 hospitalizations of adults for burns and corrosion in Bahia from November 2018 to November 2019. When comparing this same period and this same age group to the Northeast Region, this number increases to 4081 admissions. In the entire national territory, in the same period and age group, there were a total of 16,231 hospitalizations<sup>11</sup>.

The epidemiological data of patients admitted to the burn treatment unit are of paramount importance as it is a way of knowing the main factors related to burns and developing preventive measures that reduce the incidence of such events<sup>12</sup>.

In the period studied, from June 2019 to June 2020, 102 medical records were analyzed, in which females and males were equally affected by burns, a prevalence that differs from other studies<sup>2,4,5</sup>. This finding can be explained by the risk of accidents offered by the residence for the occurrence of burns<sup>13</sup>.

Regarding the age group, the patients most affected by burns belonged to the 41 to 55 group. In the literature, 20 to 24 years old, followed by 35 to 39 years old, were the most prevalent, which differs from the results of this research<sup>4</sup>.

The reason for the burn is following the literature, in which most burns are accidental in nature<sup>14</sup>. The most common causal agents were hot liquids and flame, corroborating the literature<sup>3</sup>.

According to the literature, the most affected regions were lower limbs and upper limbs, which shows the limbs as the most affected; however, the present study differs from the others in terms of this involvement<sup>15</sup>. Concerning the depth of the injuries, second-degree burns were the most prevalent in this study. Similar results were found in other studies<sup>2,16</sup>.

Surgical debridement was the most performed procedure in patients, a result also obtained in the literature<sup>4</sup>, in which debridement was responsible for 58.74% of procedures performed in burn patients in Indonesia.

The length of hospital stay in this research, which averaged 11 to 15 days, agrees with the literature, which shows an average of 13.3 days<sup>3</sup>, which the reduced specialized team can justify, and not available on all days of the week, postponing some procedures in the area, and extending the length of stay.

Complications were found in 11.8% of the patients, a value that differs from that found in the literature<sup>8</sup>, which resulted in complications in 63.1% of the patients, which can again be explained by the level of complexity of the referred burn center. The smaller sample size can also explain this difference in this research (102).

In this study, there was a prevalence of hospital discharge, and only 2.9% had death as an outcome, a result also found in the literature<sup>16</sup>, with 97.1% of patients being discharged and 2.7% dying. Despite converging with results from other studies, these data can be justified by the proposal of the burn center studied, that is, because it is a care unit for small and medium burns, these numbers become biased, since large burns, the main responsible for the mortality rates of this condition, are promptly transferred to other institutions.

In this context, epidemiological studies are valuable because they create information for carrying out preventive public health policies<sup>17</sup>, thus showing the importance of carrying out this work, aiming at improving public assistance to burn victims with greater efficiency and effectiveness.

However, this work is limited by the absence of some variables in the patients' charts or incomplete information. In addition, this research brings specific data from a region in the interior of Bahia, which may not be compatible with other regions.

## CONCLUSION

In this study, in the epidemiological profile of the patients, there was an equality in prevalence between the sexes, aged between 41 and 55 years and without comorbidities. The main causal agent was scalding, followed by direct contact with flame. There was a prevalence of second-degree burns, and the main reason that led to the burn was accidental.

Burning is an avoidable evil, so epidemiological data are tools that contribute to the development of care and prevention aimed at this group to reduce burns accidents.

This study may serve to plan public health policies to care for and prevent burns.

## COLLABORATIONS

**ACSP** Analysis and/or data interpretation, Conception and design study, Conceptualization, Data Curation, Final manuscript approval, Formal Analysis, Investigation, Methodology, Project Administration, Writing - Original Draft Preparation, Writing - Review & Editing

**KLNC** Analysis and/or data interpretation, Conception and design study, Conceptualization, Data Curation, Final manuscript approval, Formal Analysis, Investigation, Methodology, Project Administration, Writing - Original Draft Preparation, Writing - Review & Editing

**PPAF** Conception and design study, Conceptualization, Final manuscript approval, Methodology, Project Administration, Supervision, Writing - Review & Editing

**JLOJ** Conception and design study, Conceptualization, Final manuscript approval, Methodology, Project Administration, Supervision, Writing - Review & Editing

**MNSR** Conception and design study, Final manuscript approval, Methodology, Writing - Review & Editing

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