



Clinical and epidemiological profile of burn victims, a retrospective study

Perfil clínico e epidemiológico de pacientes vítimas de queimaduras, um estudo retrospectivo

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■ ABSTRACT

Introduction: In Brazil, burns affect around one million people/year, the majority of whom are male. In addition to physical and emotional losses, there is an economic impact, with costs for the health system, compensation, and work disabilities. For these reasons, epidemiological studies are important to outline the profile of the most affected population, guiding the prevention of this condition. **Method:** Review the medical records of 398 burn victims admitted to Santa Casa de Santos from January 2016 to December 2019. **Results:** The main victims were young men in a domestic environment, by heated liquids, mostly causing second degree burns, treated within 24 hours, considered major burns, and admitted to the infirmary for up to two weeks. Approximately 90% were discharged with improvement, requiring only debridement and dressings. **Conclusion:** Our work agrees with most reviews regarding the prevalence of young, economically active males with accidentally heated liquids in their homes. Other studies highlighted children as the most affected, showing the need for policies for both age groups. Regarding hospitalization, the majority remained in the ward, with second-degree burns, with major burns prevailing, which leads to greater severity and costs. This data goes against some studies, which indicate second-degree burns as the main burn, with less than 10% of the body surface burned. In both this and most studies, most patients had a good outcome, without needing an Intensive Care Unit or surgical procedures, showing the importance of early debridement and care with dressings.

Keywords: Burns; Analytical epidemiology; Reconstructive surgical procedures; Occlusive dressings; Accident prevention.

■ RESUMO

Introdução: No Brasil, queimaduras acometem cerca de um milhão de pessoas/ano, a maioria do sexo masculino. Além de prejuízos físicos e emocionais, há impacto econômico, com gastos para o sistema de saúde, indenizações e incapacidades laborais. Por estas razões, estudos epidemiológicos são importantes para traçar o perfil da população mais acometida, orientando a prevenção dessa afecção. **Método:** Revisão dos prontuários de 398 vítimas de queimaduras, internados na Santa Casa de Santos, de janeiro de 2016 até dezembro de 2019. **Resultados:** Os principais acometidos são homens, jovens, em ambiente doméstico, por líquidos aquecidos, causando em sua maioria queimaduras de segundo grau, atendidos em até 24 horas, considerados grandes queimados e internados em enfermaria por até duas semanas. Aproximadamente 90% recebeu alta com melhora, necessitando apenas de desbridamento e curativos. **Conclusão:** Nosso trabalho concorda com maioria das revisões em relação à prevalência do sexo masculino, jovens, economicamente ativos, em suas residências, com líquidos aquecidos, acidentalmente. Outros estudos apontaram crianças como as mais afetadas, mostrando necessidade de políticas voltadas a ambas as faixas etárias. Com relação à internação, a maioria permaneceu em enfermaria, com queimaduras de segundo grau, prevalecendo os grandes queimados, o que acarreta maior gravidade e custos. Esse dado vai contra

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alguns trabalhos, que apontam queimadura de segundo grau como principal, porém com menos de 10% da superfície corporal queimada. A maior parte dos pacientes, tanto neste quanto na maioria dos estudos, apresentou bom desfecho, sem necessidade de Unidade de Terapia Intensiva ou procedimentos cirúrgicos, mostrando a importância do desbridamento precoce e cuidados com curativos.

Descritores: Queimaduras; Epidemiologia analítica; Procedimentos cirúrgicos reconstrutivos; Curativos oclusivos; Prevenção de acidentes.

INTRODUCTION

OBJECTIVE

In Brazil, burns are an important public health problem, affecting around one million people per year, of which 100,000 seek hospital care and 2,500 die¹.

Several factors influence the prognosis of these patients, such as age, nutritional status, presence of complications, immunological status, type of agent that caused the burn, degree, location of injury, infection, therapeutic structure of the care service, and performance of the healthcare team².

In several epidemiological studies, it is found that children (mainly males) are the most affected by burns due to curiosity and inability, this being the second accidental cause of death in this age group³. Children and adolescents have a great emotional impact as they are undergoing psychological development, which leads to difficulty in dealing with stressful situations caused by pain, discomfort, and hospital admission, in addition to physical changes generated by the burn, causing low self-esteem, social isolation, interfering with the patient's quality of life⁴.

In addition to the impact on these people's lives, there is also the impact on public financial resources. This occurs not only due to the care and treatment of these patients in the health care network (Sistema Único de Saúde) but also due to compensation costs for disabilities caused by the burn. Regarding the latter, according to the World Health Organization, in 2016, 10 million people were considered incapacitated in the world (80% of which are located in low- and middle-income countries)⁵.

Burn treatment is extremely difficult in the medical field due to the patient's severity upon admission, as well as the long follow-up caused by complications. Furthermore, few professionals are dedicated to providing care and studying the topic³.

Epidemiological studies are extremely important to guide better health promotion practices (such as prevention campaigns and improvements in the cost-effectiveness of burn care). For this reason, it was necessary to carry out this work, outlining the profile of burn victims in the Plastic Surgery and Burns Service of Santa Casa da Misericórdia de Santos⁶.

To outline the clinical and epidemiological profile of burn victims treated at the Plastic Surgery and Burns Service of Santa Casa da Misericórdia de Santos (SCPSCS) from January 2016 to December 2019 to prevent such an event.

METHOD

Kind of study

An observational, cross-sectional, descriptive, and retrospective study was carried out.

Search location

The research was conducted at the Plastic Surgery and Burns Service of Santa Casa da Misericórdia de Santos.

Study reference population

Three hundred ninety-eight burn victims were treated and admitted to the SCPSCS from January 2016 to December 2019.

Search time

The data collection time was two months.

Inclusion and exclusion criteria

Among the inclusion criteria are:

- patient who suffered a burn from January 2016 to December 2019;
- hospitalization at SCPSCS during the period in question.

The following were excluded from the study:

- burn victim patient, in which the accident occurred outside the period studied (January 2016 to December 2019);
- burn victim patient who was hospitalized outside the studied period;

- burn victim patient who was treated in the SCPSCS emergency room but who was not admitted to the ward or Intensive Care Unit (ICU) there.

Variables studied

In this work, the following variables were studied: 1) Sociodemographic identification (age, origin, and sex); 2) Place where the trauma occurred (public street, work, or home); 3) Classification of the burn (in terms of depth [first, second and third degree]), in terms of the body surface burned - BSB - (small, medium or large burned) and in terms of the etiological agent (flame, hot water, flammable chemical, electricity, and others); 4) Cause of the accident (work accident, domestic accident, attempted murder or attempted self-extinction); 5) Time elapsed from the accident to the first assistance at SCPSCS; 6) Need for admission to the Intensive Care Unit or ward; 7) Length of hospital stay; 8) Treatment performed (grafting, flap, debridement, microsurgery, and others); 9) Complications (caused post-operatively); and 10) Reason for hospital discharge (clinical improvement, evasion, death or transfer to another service). All information collected referred to the study period mentioned above.

Procedures

After the Human Research Ethics Committee approved, the researcher collected the data by analyzing medical records using the research protocol (Appendix A). The protocol contains the variables mentioned above. It was not necessary to use the Free and Informed Consent Form, as the researcher did not have direct contact with the patients, as this was a retrospective study in which only an analysis of medical records was carried out.

Ethical aspects

The researcher committed to confidentiality regarding the identity of the subjects of this study following Resolution 466/12 of the National Health Council of the Ministry of Health. The study was carried out after evaluation and approval by the Research Ethics Committee in Human Beings.

The project presented minimal risks due to there being no direct contact with patients, and this minimal risk was resolved, as the researcher committed to maintaining confidentiality regarding patient identification.

The benefits of the work consisted of obtaining updated statistics on the clinical and epidemiological profile of burn victims who were treated at the SCPSCS, which can assist in public policies aimed at preventing this accident.

Data analysis

The collected data will be studied and presented through graphs and constructed by the Microsoft Office Excel version 2018 program, the textual part written by Microsoft Office Word version 2007.

RESULTS

Between 2016 and 2019, 398 burn patients were admitted to the SCPSCS, with the sample for this study being 393 patients.

Regarding the origin of the patients, the majority came from the Metropolitan Region of Baixada Santista, with 109 (27.74%) from Santos, 81 (20.61%) from São Vicente, 54 (13.74%) from Praia Grande, 46 (11.70%) from Guarujá, 25 (6.36%) from Itanhaém, 22 (5.60%) from Cubatão, 15 (3.82%) from Peruíbe, 13 (3.31%) from Bertioga, 10 (2.54%) from Mongaguá and 18 from other cities, mainly coming from São Paulo, with 6 (1.53%) people, as shown in Table 1.

Table 1. Epidemiological data.

VARIABLES	n	%
Age range (years)		
<5	99	25.19%
5 to 10	34	8.65%
11 to 17	30	7.63%
18 to 59	196	49.87%
> 60	34	8.65%
Sex		
Masculine	252	64.12%
Feminine	141	35.88%
Origin		
Metropolitan Region of Baixada Santista	375	95.42%
Other Cities	18	4.58%
Accident Location		
Home Environment	277	70.48%
Public highway	38	9.67%
Workplace	36	9.16%
Did not inform	42	10.69%

Source: Research Protocol 2021

Among the causes of the accident, 300 (76.34%) were domestic accidents, 46 (11.70%) work accidents, 14 (3.56%) attempted homicides, 13 (3.31%) attempted suicides, and 1 (0.25%) car accidents. Nineteen people (4.83%) did not inform the cause.

Regarding the time elapsed from the accident to the first care at SCPSCS, 260 (66.16%) patients were seen in less than 24 hours (h), 60 (15.27%) in the period from 24h to 48h, 48 (12.21%) from 2 to 7 days and 13 (3.31%) after 7 days of the accident. A total of 12 (3.05%) patients did not have this data recorded in the medical record.

Of the complications caused in the postoperative period of burn patients, partial necrosis of the graft, as well as surgical wound infection, were reported in 11 cases (2.80%) each, followed by scar retraction, with 3 (0.76%) cases, and flap dehiscence, with 1 case (0.25%). The majority, 367 (93.38%), had no reported postoperative complications.

Regarding the classification of burns, Table 2 shows the following data:

Table 2. Classification related to burns.

VARIABLES	n	%
Causal agent		
Scalding	177	45.04%
Flame	146	37.15%
Electricity	29	7.38%
Chemical product	18	4.58%
Heated object	5	1.27%
Friction	1	0.25%
Did not inform	17	4.33%
Depth		
2 nd degree	326	82.95%
2 nd and 3 rd degree	37	9.41%
1 st and 2 nd degree	23	5.85%
3 rd degree	4	1.02%
1 st , 2 nd and 3 rd degree	2	0.51%
1 st degree	1	0.25%
Gravity		
Large burn	155	39.44%
Medium burnt	151	38.42%
Small burnt	87	22.14%

Source: Research Protocol 2021

Table 3 presents information regarding hospitalization and discharge conditions.

Finally, data regarding the treatment of these patients are presented in Table 4:

Table 3. Hospitalization data.

VARIABLES	n	%
Place of hospitalization		
Nursery	282	71.76%
ICU*	111	28.24%
Length of stay (days)		
Up to 7	104	26.46%
8 to 14	118	30.03%
15 to 21	65	16.54%
21 to 30	23	5.85%
31 to 60	48	12.21%
61 to 90	18	4.58%
Greater than 91	17	4.33%
Bullish condition		
Improved	352	89.57%
Evasion	22	5.60%
Death	16	4.07%
By request	3	0.76%
Transfer	0	0.00%

Source: 2021 research protocol; (*) Intensive care unit.

Table 4. Burn treatment.

TREATMENT	N=394	
	N	%
Debridement and dressing only	314	79.90%
Partial skin graft	65	16.54%
Total skin graft	11	2.80%
Myocutaneous flap	2	0.51%
Microsurgical flap	1	0.25%
Eyelid reconstruction	1	0.25%

Source: Research Protocol 2021

DISCUSSION

According to Coutinho et al.⁷, there is a prevalence of adults suffering from burns, with 54.86% of the patients in their research being over 16 years old, which is in line with this study, which shows that individuals aged 18 to 59 years old are more affected by burns compared to others. However, other studies point to children as the most affected. This was found in the research by Santos Junior et al.⁸, in which, in a sample of 952 patients, 51.15% were children aged 0 to 12.

Regarding the sex of the patients, this study shows that 64.12% of the patients are men, corroborating the majority of literature, which points to the male sex as the most affected by burns, as can be seen in the research by Santos Junior et al.⁸, Francisconi et al.⁹

and Bessa et al.¹⁰, which show 63.02%, 69.4%, and 63.8% respectively, of men affected by the condition.

It was found that 95.42% of patients come from the Metropolitan Region of Baixada Santista, which is demonstrated in the study by Padua et al.¹¹, in which the majority of burns treated at SCPSCS from 2010 to 2015 were from this location, with Santos standing out with 39.1%, as in the present study, which found 27.74% of Santos residents.

Lacerda et al.¹² showed that 51.5% of burn victims suffered a domestic accident, the cause being unintentional, which is similar to the study in focus, which showed that 76.34% were domestic accidents. Lacerda et al.¹² also highlight that the percentage of suicide attempts is low and reaches 4.95%, bringing it even closer to this study, which found 3.31% of those burned due to attempted self-extermination.

This study shows that the most common causal agent of burns was heated liquids (45.04%), followed by direct contact with the flame (37.15%), similar to the study by Bessa et al.¹⁰, which points out the main cause of burns is contact with heated liquids (water and coffee, which together account for 39.9%), followed by contact with the flame (38%), just as Takino et al.⁶ point to scalding as the main causal agent of burns with 53%, followed by flame with 30%, however, this latest study focuses on patients aged 0 to 17 years, who are more susceptible to scald burns.

In studies by Santos Junior et al.⁸ and Santana¹³, 79.41% and 56% of patients suffered only second-degree burns, just as this study indicates a prevalence of 82.95% of patients affected by the same depth of injury in previous studies.

In the research by Lacerda et al.¹², 60.4% of those burned had less than 10% of BSB, of which 65.35% of patients were considered low severity. This goes against the results of this research, which indicate that 39.44% of patients have major burns, considered to be more serious patients and susceptible to complications or death. Cruz et al.¹⁴, in their literature review, show that the average BSB in adults is 14.6%, with first-degree burns being isolated or first and second-degree corroborating the first study cited.

Most patients at SCPSCS were hospitalized for 8 to 14 days (30.03%). This data corroborates the study by Fonseca Filho et al.¹⁵, which found that 62.43% of patients with an average hospitalization of 13.37 days. Padua et al.¹¹ confirm what previous research shows, in which the length of stay was up to 14 days for 61% of patients. Of those hospitalized in this research, 71.76% went to the infirmary and 28.24% to the Intensive Care Unit, similar to studies by Takino et al.⁶, which showed

that 23% of burn victims required admission to the Intensive Care Unit.

Most patients had a good outcome, receiving an improved discharge (89.57%), while 4.07% of patients died, following what was presented by Takino et al.⁶, who showed 94% of patients were discharged from the hospital, and only 6% died.

Santana¹³ shows that 71.3% of burn victims did not have any complications, and of those who presented complications, 15.3% were due to wound infection. The research in focus shows the absence of complications in 93.38% of patients. Of those who had complications, surgical wound infection corresponded to only 11 (2.80%) cases.

The study showed that the main treatments performed were debridement and partial thickness skin grafting (79.90% and 16.54%, respectively), similar to what Lacerda et al.¹² present, with debridement (35.45%) and grafting (33.64%) being the main procedures performed.

CONCLUSION

The majority of people affected by the condition are men, in the adult age group, from the Baixada Santista Metropolitan Region, and who were burned due to a domestic accident.

Although the majority of injuries are severe second-degree burns, caused mainly by heated liquids and flame, many are treated solely with debridement of the injuries and daily dressings, presenting positive outcomes with discharge after clinical improvement, which shows the importance of qualified professionals to serve this type of patient in a targeted manner.

It is worth highlighting that these predominant profiles of burn victims are mostly hospitalized for one to two weeks in the hospital, negatively interfering with work relations and the country's economy, as they are, in most cases, active workers who help provide for their families.

Public burn prevention policies (such as education, communication, and advertising, among others) are fundamental for the prevention of this condition in order not to increase hospital costs for the short and long-term care and treatment of these patients, as well as reduce the impact economic and social of the country.

COLLABORATIONS

CBC Analysis and/or data interpretation, Data Curation, Formal Analysis, Investigation, Writing - Original Draft Preparation.

RCC Analysis and/or data interpretation, Data Curation, Formal Analysis, Investigation.

TAMA Analysis and/or data interpretation, Data Curation, Formal Analysis, Investigation.

VHAG Analysis and/or data interpretation, Data Curation, Formal Analysis, Investigation.

BBA Visualization, Writing - Review & Editing.

LTC Supervision, Validation.

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APPENDIX A - RESEARCH PROTOCOL**1- SOCIODEMOGRAPHIC DATA**

1.1-Age: < 5 years/ 5-10 years/ 11-17 years/ 18-59 years/ over 60 years

1.2 : Gender: male/ female

1.3 : Origin: Santos/ Guarujá/ Bertioga/ Cubatão/ São Vicente/ Praia Grande/ Mongaguá/ Itanhaém/ Peruíbe/

Other: _____

2- ACCIDENT LOCATION

2.1: home environment/ workplace/ public road

3- BURN CLASSIFICATION

3.1 : Etiology: flame/ scalding/ electricity/ chemical product/ friction/ Other: _____

3.2 : Degree of burn: 2nd degree/ 2nd and 3rd degree/ 1st and 2nd degree/ 1st, 2nd and 3rd degree/ 3rd degree/ 1st degree

3.3 : Body burn surface: small burn/ medium burn/ large burn

4- CAUSE OF THE ACCIDENT

domestic accident/ work accident/ attempted self-extermination/ attempted murder

5- TIME BETWEEN THE ACCIDENT AND FIRST CARE AT SCPCSCS

up to 24h/ 24-48h/ > 2 days up to 7 days/ > 7 days

6- PLACE OF ADMISSION

ICU/ ward

7- TREATMENT

only debridement + dressing

partial-thickness skin graft/ full-thickness skin graft myocutaneous flap/ microsurgical flap

amputation / others: _____

8- COMPLICATIONS

8.1: Postoperative complications:

burn infection/ surgical wound infection/ graft necrosis/

flap necrosis/ scar retraction/ others: _____

9- DISCHARGE CONDITION

improved/ hospital transfer/ evasion/ death

10- HOSPITAL TIME

up to 7 days/ 7- 14 days/ 14- 21 days/ 21-30 days/ 31-60 days/ 61-90 days/ 91-120 days/ > 120 days