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PERFIL EPIDEMIOLÓGICO DE PACIENTES INTERNADOS EM UM CENTRO DE TRATAMENTO DE QUEIMADOS

Epidemiological profile of patients hospitalized in a burns treatment center

Perfil epidemiológico de los pacientes hospitalizados en un centro de tratamiento de quemados

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RESUMO

Objetivo: delinear o perfil epidemiológico de pacientes vítimas de queimadura, que tenham sido submetidos à internação no Centro de tratamento de queimados de um hospital do Rio de Janeiro, no período de 2019 a 2021. **Método:** trata-se de uma pesquisa observacional, exploratória e descritiva, quantitativa, documental e retrospectiva, realizada em um Centro de Tratamento de Queimados (CTQ). Os dados foram coletados de 243 prontuários dos pacientes. Realizou-se a análise estatística descritiva ($p<0,05$). **Resultados:** 62,6% dos pacientes eram adultos e 56,4% do sexo masculino. O agente causador mais prevalente foi a chama direta, com 56,4%. Identificou-se 63,6% dos acidentes ocorreram no contexto doméstico. Em 69,3% encontrou-se a superfície corporal queimada entre 1% a 20,9%. Dentre as coberturas 96,7% foram com a sulfadiazina de prata. **Conclusão:** foi possível evidenciar a necessidade de prevenção, educação, novas pesquisas, controle de disponibilidade de agentes causadores e protocolos hospitalares voltados a este perfil de paciente.

DESCRITORES: Queimaduras; Epidemiologia; Perfil de saúde.

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ABSTRACT

Objective: to delineate the epidemiological profile of burn victims who under went hospitalization at the Burn Treatment Center of a hospital in Rio de Janeiro, from 2019 to 2021. **Method:** This is an observational, exploratory research and descriptive, with a quantitative, documentary and retrospective approach, carried out in a Burn Treatment Center. Data were collected from 243 patients' medical records using an instrument created by there searchers. Descriptive statistical analysis ($p<0.05$) was performed. **Results:** it was identified that 62.6% of the patients were adults and 56.4% were male. The most prevalent causative agent was direct flame, with 56.4%. It was found that 63.6% of the accidents occurred in the domestic context. In 69.3%, the body surface was burned between 1% and 20.9%, with second-degree burns being themost profound, with 75.6%. Among the most used toppings, silver sulfadiazines tood out, with 96.7%. **Conclusion:** Based on the data collected, it was possible to delineate the profile of patients treated at this burn treatment center, high lighting needs for prevention, education, improvement, new research, control of the availability of etiological agents and hospital protocols aimed at this patient profile.

DESCRIPTORS: Burns; Epidemiology; Health profile.

RESUMEN

Objetivo: delinear el perfil epidemiológico de las víctimas de quemaduras que fueron internadas en el Centro de Tratamiento de Quemados de un hospital de Río de Janeiro, de 2019 a 2021. **Método:** se trata de una investigación observacional, exploratoria y descriptiva, con enfoque cuantitativo, documental y retrospectivo, realizado en un Centro de Tratamiento de Quemados (CTQ). Los datos fueron recolectados de las historias clínicas de 243 pacientes utilizando un instrumento creado por los investigadores. El análisis estadístico descriptivo ($p<0,05$) se realizó. **Resultados:** se identificó que el 62,6% de los pacientes eran adultos y el 56,4% eran del sexo masculino. El agente causal más prevalente fue la llama directa, conun 56,4%. Se constató que el 63,6% de los accidentes ocurrieron en el ámbito doméstico. En el 69,3% se quemó la superficie corporal entre el 1% y el 20,9%. Entre los toppings más utilizados se destacó la sulfadiazina de plata, con 96,7%. **Conclusión:** a partir de los datos recolectados, fue posible delinear el perfil de los pacientes atendidos en este centro de tratamiento de quemados, destacando necesidades de prevención, educación, mejora, nuevas investigaciones, control de la disponibilidad de agentes etiológicos y protocolos hospitalarios dirigidos a este paciente perfil.

DESCRIPTORES: Quemaduras; Epidemiología; Perfil de salud.

INTRODUÇÃO

A urns are defined as tissue injuries caused predominantly by thermal damage.[1] Depending on the nature of the injury, they can cause irreversible physical and psychological sequelae and, in more serious cases, lead to death.[2]

The World Health Organization (WHO) estimates that around 180,000 deaths occur every year from fire-related burns.[3] The WHO has also found that underdeveloped countries have a higher incidence of burns when compared to developed countries, and this is evidenced by the difference in the development of prevention policies implemented by governments.[4]

In Brazil, burn injuries are considered a public health problem, because according to the Ministry of Health (MS), it is estimated that there are around one million new cases of burn victims every year, and of these, around 100,000 are treated in hospital, with approximately 2,500 deaths resulting from the injuries.[2,3]

Injuries caused by burns have a major impact on the quality of life of victims, but also mobilize financial resources for the Unified Health System (SUS), representing a large proportion of admissions to public hospitals in Brazil.[1]

The justification for this study is the need to maintain scientific research with current data on the epidemiological profile of patients admitted to the Burn Treatment Center at a hospital in Rio de Janeiro in order to understand the dynamics of the cases, the age groups most affected and thus enable reflections on how health professionals and society can seek changes to prevent this serious public health problem.

Based on the data collected and presented to the scientific and professional community, we hope to make a positive contribution in order to devise new, more specific and up-to-date health strategies for this public. It is understood that the phenomenon is not new and there are many publications on it, but the analysis of the registration of cases that occurred during the context of the public health emergency that was the COVID-19 pandemic can evoke reflections on the number of cases treated, how the registrations occurred, the care and treatment of burns in the face of this challenging scenario.

As this is a broad and recent study, which brings together numerous and specific variables, it is possible that, in addition to serving as a subsidy for new lines of research, it will contribute to the discussion and search for solutions to institutional problems, to the construction of hospital educational protocols and strategies and to the dissemination of health information.

Characterization studies of this kind help guide the multi-professional team from pre-hospital care to the recovery of these patients.2 The aim of this study was to outline the epidemiological profile of burn patients who were admitted to the Burn Treatment Center of a hospital in Rio de Janeiro between 2019 and 2021.

METHODS

This is an observational, exploratory and descriptive study, with a quantitative, documentary and retrospective approach, carried out in a Burn Treatment Center (CTQ), in a hospital located in Rio de Janeiro, as it is a reference unit in the care of patients who are victims of burns.

The data was obtained through secondary information obtained from the physical records of patients of all age groups who were admitted to the study hospital between 2019 and 2021.

Initially, the research had a universe of 331 medical records to be analyzed, but after the sample calculation, 243 records remained to be read in full and the recorded data extracted.

This study had eligibility criteria for the selection of medical records: patients who were victims of burns, regardless of age group, who were hospitalized due to burns between 2019 and 2021. Medical records with illegible or incomplete variables were excluded.

In order to collect the data, a collection instrument was drawn up that covered the following variables: age, gender, body surface burned, context, causative agent, depth, coverings, infectious condition, microor-

ganisms, outcome, interaction time and cause of death. Data was collected from June 2022 to February 2023.

The Microsoft Excel® software program was used to tabulate the data, where the information was organized according to the variables proposed in the collection instrument. The data was analyzed using descriptive statistics, with the support of the Jamovi-Stats. Open. Now.® software. Based on this organization, it was possible to make the data available in tables which are set out in this article and, consequently, to outline the profile of the patients seen at the CTQ.

Although the research did not directly involve patients, it was submitted to the Ethics and Research Committee of the Federal University of the State of Rio de Janeiro (UNIRIO) for approval under protocol number 5.375.341 and CAAE: 57389422.0.0000.5285. It complies with Resolution 466/2012 and Resolution 510/2016 of the National Health Council, which regulates the rules of research involving human beings.

RESULTS

In the period from 2019 to 2021, the burns treatment center received 331 patients for hospitalization, with 134 patients in 2019, 115 patients in 2020 and 82 patients in 2021, where an annual drop in the number of hospitalizations can be observed. To build the study's documentary corpus, 243 medical records were analyzed, 88 of which were excluded due to unavailability during the collection period.

With regard to sociodemographic data, it was found that males (56.4%) and adults (62.6%), aged between > 18 years and < 60 years, were the most affected by burns, as shown in Table 1.

***Table 1**- Sex and age. Rio de Janeiro, RJ, Brazil, 2023*

GENDER	N	%
Male	137	56,4%
Female	106	43,6%
TOTAL	243	100%
AGE	N	%
Children (< 12 years)	39	16%
Teenagers (> 12 to < 18 years)	18	7,4%
Adult (> 18 to < 60 years)	152	62,6%
Elderly (60 years and over)	34	14%

Table 2 shows that the main agent responsible for the accidents was thermal (74.3%), with direct flame being the most prevalent (56.4%), followed by overheated liquids (38.5%) and others (5.1%).

The most prevalent context in which the patients were living at the time of the burn was domestic (63.6%).

***Table 2**- Etiological agents and context. Rio de Janeiro, RJ,*

ETIOLOGICAL AGENTS	**N**	**%**
Thermal	179	74,3%
Chemicals	38	15,8%
Electrical	18	7,5%
Radiant	5	2%
Biological	1	0,4%
TOTAL	**241**	**100%**
CONTEXT	**N**	**%**
Domestic	154	63,6%
Labor	27	11,2%
Self-extermination	14	5,8%
Leisure	09	3,7%
Feminicide	06	2,5%
Attempted murder	05	2,1%
Other	27	11,2%

It was found that 69.3% of patients had between 1 and 20.9% of their body surface burnt, with 2nd degree burns being the deepest (75.6%), as can be seen in Table 3.

***Table 3** - SCQ and depth. Rio de Janeiro, RJ, Brazil, 2023*

BURNT BODY SURFACE (%)	**N**	**%**
1 to 20,9%	167	69,3%
21% to 40%	57	23,7%
Greater than 40.9 %	17	7%
TOTAL	**241**	**100%**
DEPTH	**N**	**%**
1st degree	1	0,4%
2nd degree	180	75,6%
3rd grade	57	24%

Table 4 shows that only 37.6% of patients had an infection during hospitalization, with the most common microorganism being Staphylococcus (52.7%).

***Table 4** - Infectious conditions and microorganisms. Rio de Janeiro, RJ, Brazil, 2023*

INFECTIOUS CONDITION	**N**	**%**
Yes	91	37,6%
No	151	62,4%
TOTAL	**242**	**100%**
MICROORGANISMS	**N**	**%**
Staphylococcus	48	52,7%
Acinetobacter	29	31,9%
Enterobacter	18	19,8%
ESBL**	12	13,2%
SerratiaMarcescens	10	11%

*microorganisms with a frequency of less than 10%.
** Extended-spectrum beta-lactamase (ESBL): a marker enzyme for bacterial resistance.

As for the outcome, 88% were discharged. The most frequent cause of death (10.3%) was shock (36%), as shown in Table 5.

***Table 5** - Hospitalization outcome and frequency by cause of death. Rio de Janeiro, RJ, Brazil, 2023*

OUTCOME	**N**	**%**
High	*213*	*88%*
Death	*25*	*10,3%*
Discharge in absentia	*02*	*0,8%*
Evasion	*02*	*0,8%*
TOTAL	***241***	***100%***
CAUSE OF DEATH	***N***	***%***
Shock	*09*	*36%*
Complications of a major burn	*07*	*28%*
Not specified	*06*	*24%*
Cardiorespiratory arrest	*05*	*20%*
Sepsis	*04*	*16%*
Other	*08*	*32%*

*percentage calculated using the total number of deaths (25 deaths). Causes taken from the document issued by the Institute of Forensic Medicine (IML).

Silver sulfadiazine (96.7%) was the most frequently used dressing during the patients' hospitalization, followed by neomycin (88.8%). Completing this variable, "other coverings used" (56.2%) were Vaseline, non-adherent gauze with essential fatty acids (EFA) or petrolatum, calcium alginate, Urgoclean AG, Urgotul, ozonized EFA, Urgostart, Dexamethasone, Colzen, Diprogenta, Fibracol, Hydrofiber with silver, Hydrogel, Bacitracin, Acticoat, Collagenase, PHMB, Essential fatty acids, PVPI, Trichloroacetic acid, Biatainag, Hydrocolloid, Nebacetin. It should be noted that all the types of coverings mentioned were described according to the record found on the nursing instrument. Parts of these coverings were only used in isolated cases, with no record of criteria for their use. It was found that the length of stay was up to 20 days (48.4%), followed by 21 to 40 days (33%) and then more than 40 days (18.6%), with an average of 29 days.

DISCUSSION

In this study, the highest incidence of burns was in males (56.4%). Similar results were found in several studies, which mention that this prevalence may be related to occupational, cultural and behavioral conditions, such as unhealthier work activities compared to females and greater exposure to risk factors. The lack of or incorrect use of safety equipment in the workplace can also be mentioned.[4-6]

With regard to age, there was a predominance of adults aged between 18 and 60 (62.6%), followed by children under 12 (16%). There are differences in the studies found regarding the age group most affected by burns. Some cite that children are more affected, due to factors such as curiosity, restlessness and also physical and cognitive development.[6,7]

However, corroborating the results found in this study, other studies point out that adults are a more economically active population and are therefore more susceptible.[4,5] Another issue observed is related to the structure and care of the research hospital, since it has an adult care profile. As such, it can be inferred that age may vary depending on the hospital's care profile.

As for the etiological agents, 74.3% were of thermal origin, with accidents involving direct flame (56.4%) or overheated liquid (38.5%) being the most common. Studies show that these are the main factors in hospitalization, since they are mostly caused by products such as overheated water, oil and milk or alcohols in their liquid form, which are sold freely, stored in easily accessible places and used routinely, and can lead to a greater occurrence of burns.[4,6]

With regard to the context in which the burns occurred, the most frequent was domestic, totaling 63.6% (154) of the cases, followed by work (11.2%). This result is in line with the National Burn Information Exchange, which in 1996 identified that 60% of accidents involving burns happen in the context of the home environment.8 In addition, various studies that have also evaluated this type of epidemiological profile have pointed to the home and work settings as the most prevalent for burn victims, characterizing them as potentially unsafe places, since they present a greater risk for accidents of this nature.[2-5,8] Several factors make the home environment more prone to accidents of this nature, such as precarious housing with a high number of residents[3,6], low socioeconomic status, low education, inadequate spaces, poor kitchen equipment, among others.[3]

As for depth, the sample collected shows that among the degrees, the 2nd degree (75.6%) was the most frequent, followed by the 3rd degree (24%). Considering that most of the individuals had mixed burns, i.e. one or more degrees. Other studies also point to 2nd degree burns as being predominant.[4,6] With regard to CQS, more than half of the cases had between 1 and 20.9% (69.3%) of the body burned. It is important to bear in mind that individuals with a second-degree burn with more than 20% of their body surface burned and a third-degree burn with more than 10% of the surface are considered to be severely burned. Together, the depth of the burn and the surface area of the body burned are considered factors that can interfere with the length of hospital stay, the number of procedures carried out, the outcome at discharge and even an increase in the mortality rate.[4,5]

One of the main challenges for burn victims is infection, which is associated with a high rate of complications that can potentially worsen the patient's condition and lead to death. Of the 242 burn victims analyzed during the period, the majority, 151 (62.4%), were not affected by any infectious conditions during their hospital stay. This negative predominance for the development of an infectious condition may be associated, among other factors, with the start of the Covid-19 pandemic in 2020, which also lasted into 2021, when there was possibly an intensification in hospital infection control practices, such as hand hygiene, for example, at the study site. Several factors put this type of individual at risk of developing an infection, such as the conditions in which they arrived in the hospital environment, hospital conditions, risk factors that the patient already had before the accident, among others.[10] A study conducted in Minas Gerais found that the risk of death was almost six times higher in burns patients (RR=5.96), while individuals who died were twice as likely to be infected.[11]

More than one type of infectious agent was observed in some of the 91 (37.6%) individuals affected by an infection, with 151 episodes of infection by different types of microorganisms being identified. The highest incidence was 48 (52.7%) infections by Staphylococcus, followed by 29 (31.9%) by Acinetobacter and 18 (19.8%) by Enterobacter. This finding is in line with the majority of the articles evaluated, with only two being similar. In his studies, Araújo (2020) identified Staphylococcussp. as the most prevalent (26.262%)8 and Hernández (2022) identified Staphylococcusaureus (51.73%)10. Another point that should be taken into consideration is the susceptibility of burn patients to the proliferation of microorganisms, due to the presence of degraded proteins and the devitalization of the tissue affected by the burn.[12] In his study, Dalla-Corte (2019) pointed out that burn victims are prone to various types of complications, with the infectious condition being the predominant one during the hospitalization period.[4]

Among the data collected on the infectious condition, 12 samples were found to be positive for Extended Spectrum Beta-Lactamase (13.2%), an enzyme produced by some bacteria that acts to promote antimicrobial resistance, with gram-negative enterobacteria being the main producers of this enzyme.[13] This enzyme is related to multidrug-resistant

infections, which are a major challenge for health services, leading to higher treatment costs and possibly prolonging hospital stays.[13] Understanding the microbiological profile enables actions aimed at controlling and preventing these problems, from hand hygiene to the correct choice of antimicrobial, contributing to a better prognosis.

Consolidating the information found in this study with the studies analyzed, it is clear that silver sulfadiazine is the first-choice cover for the treatment of burns, with its antimicrobial action being the main reason for recommending its use.[5,14,15] One of the studies analyzed showed a divergence when it came to the choice of topical therapy, with AGE being the most commonly used cover for treatment, followed by silver sulfadiazine.[6]

In addition, it was found that the patients were submitted to the use of other coverings during treatment, in addition to silver sulfadiazine, as can be seen in this and other studies analyzed.[6,14]

It should be noted that although silver sulfadiazine is a standard topical therapy, some studies have expressed opinions about its efficacy, considering the varieties found today and the disadvantages it presents during treatment. Some of the negative points include bacterial resistance, pain due to its adherence to the lesion bed, exudation, greater need for replacement, which leads to infections and thus increased costs.[14-16]

Although some studies mention coverings with advantages in their application, such as low pain thresholds, less traumatic to the tissues formed, increased change intervals and the possibility of lowering costs, they note the need for research and evidence to define the best therapies for these patients.[5,14-15]

Complementing the data presented in this discussion, with the studies analyzed and hospital experience, it can be inferred that there are factors that influence the choice of coverings and their possible associations during treatment, such as the resources available in the hospital environment where the patient is undergoing treatment, the depth of the lesion, the type of tissue present in the lesion, updating, expertise and analysis of the professional responsible for conducting the topical treatment.

As for the outcome of these patients, 88% were discharged from hospital after treatment. Similar results have been observed in other studies, where the predominance of discharges was almost total.[5,6,17-18] Corroborating some studies, advances and developments in the care of burn patients, such as topical therapies, nutritional therapy and professional qualifications, have led to this outcome.[6,17]

Of the four studies analyzed, only one showed shock as the main cause of death, which is similar to the results of this study. This result is explained by the complications caused by burns to organs and systems, and is also related to the size of the body surface burnt.[17] In contrast, the majority of articles presented sepsis as the main and most frequent complication in burn cases, which also relates to the extent of the body surface burnt, adding age and the depth of the injury as factors that interfere with the outcome of these patients.[4-5,11]

The average length of stay in this study was approximately 29 days, which differs from some of the studies analyzed, which showed a lower average of between 11.58 and 14 days.[4-5]

CONCLUSION

Based on the data collected, it was possible to trace the epidemiological profile of patients admitted to the Burn Treatment Center from 2019 to 2021, which corresponds to males (56.4%), adults (62.6%) with an age range from over 18 years to under 60 years. The majority of burns occurred in a domestic context (63.6%), with direct flame (56.4%) being the most prevalent agent.

The percentage of body surface burned (69.3%) ranged from 1% to 20.9%, with 2nd degree burns (75.6%) being the most common. Silver sulfadiazine was the most commonly used topical therapy (96.7%). Only a fraction of the patients had an infection (37.6%) during hospitalization, with Staphylococcus being the most prevalent, in addition to some patients having concomitant colonizations and, in certain cases, the occurrence of antimicrobial resistance.

Discharge (88%) was the most prevalent outcome. Shock predominated as the cause of death (36%). The average length of stay was 29 days, with the longest being 245 days and the shortest being less than 24 hours.

Given the data presented, it is clear that the care of burn patients is complex and requires prevention policies, greater control over the marketing of the causative agents, training for care teams, the development of studies that delve into more specific topics, such as the most efficient coverings in the treatment of burn patients, as well as continuing education on infection prevention, hand hygiene and others in the hospital environment.

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