Indicadores clínicos da sepse no paciente queimado

Clinical indicators of sepsis in burned patients

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Resumo

O estudo possui como objetivo identificar a prevalência de sepse e caracterizar os pacientes queimados em um Centro de tratamento de Queimados. Trata-se de um estudo transversal, quantitativo, retrospectivo, com técnica de coleta de dados por análise de prontuários dos pacientes. Foram identificados 120 prontuários e selecionados 23 que atenderam aos critérios de inclusão e exclusão da pesquisa, no ano de 2016. Foi encontrada uma taxa de prevalência de sepse nos pacientes queimados de 19%, as características mais frequentes foram: idade inferior a 60 anos, gênero feminino, superfície corporal queimada acima de 30% e tempo de internação maior que 60 dias. Os agentes da queimadura mais frequentes foram: chama e líquido superaquecido. Todos os pacientes apresentaram queimaduras de 2º grau e 83% obteve prognóstico positivo. Conclui-se que a prevalência de sepse apresentou uma taxa elevada, as características demonstram a necessidade de definir indicadores clínicos e um planejamento de cuidado otimizado e seguro destes pacientes.
Palavras-chave: Sepse; Enfermagem; Queimadura; Sinais Clínicos; Terapia Intensiva.

Abstract

The purpose of this study was to identify the prevalence of sepsis and to characterize patients who were burned at a Burn Treatment Center. This is a cross-sectional, quantitative, retrospective study using a technique of data collection by analyzing patients' charts. A total of 120 medical records were selected and 23 were selected that met the criteria for inclusion and exclusion of the study in the year 2016. A prevalence rate of sepsis in burn patients was found to be 19%. The most frequent characteristics were: age less than 60 years, female gender, burned body surface area above 30% and hospitalization time greater than 60 days. The most frequent burn agents were: flame and superheated liquid. All patients had 2nd degree burns and 83% had a positive prognosis. It is concluded that the prevalence of sepsis presented a high rate, the characteristics demonstrate the need to define clinical indicators and an optimized and safe care planning of these patients.
Keywords: Sepsis; Nursing; Burn; Clinical signs; Intensive therapy.

Introduction

The skin is the largest organ of the human body, having the function of protection against external agents, among them infections, diseases and aggressions from the environment. The destruction of the skin in the burned patient increases their susceptibility to infection, which is the most frequent and serious complication and represents the major cause of mortality and morbidity in this population[1].

Burns are traumatic wounds caused, in most cases, by thermal, chemical, electrical or radioactive agents. These wounds can lead to partial or total destruction of the skin and, according to their extent and depth, can compromise muscles, tensions and bones[2].

Burns are stratified into large, medium or small according to their extent of bodily impairment; those comprising more than 40% of body tissue become more vulnerable to the development of severe infections, and sepsis accounts for at least 75% of cases of death in this clientele[3-4].

Currently, sepsis is the largest cause of death in Intensive Care Units (ICUs) and one of the leading causes of late hospital mortality.5 In 2016, the Sepsis Definitions Task Force updated the definition of sepsis for the presence of threatening organic dysfunction to secondary life to the unregulated response of the organism to infection[5].

In view of this situation, patients at the Burn Treatment Center (CTQ) are highlighted because they present greater vulnerability, due to the pathophysiology of the burn to have factors such as devitalized tissues, the presence of degraded proteins and the decrease in the oxygen supply that contribute to the development of sepsis, damaging its recovery and can lead to death.

In view of this new definition and the importance of identifying sepsis for the use of indicators, the literature suggests that the use of the Quick Sequential Organ Failure Assessment (QSOFA) is a tool to be used at bedside to quickly identify adult patients most likely to have unfavorable clinical outcomes if they have infection[6].

In this perspective, the nurse is the professional responsible for the care process, either managing the actions and stages of the assistance provided by the team, or performing nursing interventions directed at this clientele. In this way, he must possess scientific and practical knowledge so that his actions focus on reducing the mortality and morbidity of the patient burned with sepsis.

In view of the vulnerability of the burned patient, it is necessary to implement strategies for prevention and control of infection and monitoring adherence to these measures by professionals through professional training and continuing education programs[7].

In this sense, the following research questions were elaborated: what is the prevalence of sepsis in the burned patient?

What are the main characteristics of burned patients with sepsis?

In view of the above, the following objectives were outlined: to identify the prevalence of sepsis and characterize the patients burned at a Burn Treatment Center (CTQ).

Method

This is a cross-sectional, retrospective study using a data collection technique for chart analysis. In this study, we identified the prevalence of sepsis in the burned patient and the characteristics of these patients. The research was conducted at a Burn Treatment Center (CTQ) of a large federal public hospital in the city of Rio de Janeiro.

The CTQ has 14 beds for hospitalization, distributed in four wards, four beds for the care of children, four beds for women, four beds for men and two beds for intensive care, with approximately 120 visits per year. At the study site, there is an infection control routine that is configured to track multiresistant microorganisms both in admission to new patients and in inpatients.

The selection of medical records of sepsis patients with sepsis in the CTQ complied with the inclusion criteria: medical records of patients older than 18 years of age, of both sexes, with hospitalization records completed, hospitalized from January to December 2016 and had at least two criteria defining sepsis and organic dysfunction registered by the hospital infection commission (CCIH) at the study site. And as exclusion criteria: medical records unavailable in the period of research or incomplete.

Data were collected in August and September of 2017. Through an instrument of collection of 7 variables aimed at the characterization of the patients: age, gender, burned body surface, length of hospital stay, burn agent, type of burn and output condition.

Data were extracted from the charts in multiprofessional evolutions, nursing records and laboratory tests. As clinical criteria that defined sepsis, classification was used according to the literature8, as shown in figure 1.

Figure 1 - Clinical criteria that define sepsis[8], Rio de Janeiro, 2018.

Clinical Criteria for Sepsis	
Central temperature	> 38,3°C ou < 36°C
Heart rate	> 90 bpm
Respiratory frequency	> 20 irpm ou PaCO2 < 32 mmHg
Total leukocytes	> 12.000/mm^3 ou < 4.000/mm^3 ou presença de 10% de formas jovens
Hypotension	PAS < 90 mmHg ou PAM < 65 mmHg ou queda de PA > 40 mmmHg
Oliguria or elevated creatinine	> 2mg/Dl
PaO2 / FiO2 ratio	< 300 com necessidade de O_2 para manter SpO_2 > 90%
Platelet count	< 100.000m^3 ou redução de 50% em relação ao maior valor registrado nos últimos 3 dias

Bilirubins	> 2X o valor de 2.0 mg/dL

The collected data were then transcribed into Microsoft Excel® spreadsheets and then analyzed with simple descriptive statistics. For the evaluation of the QSOFA, the following criteria were used: a) respiratory rate ≥ 22 / incursions per minute; b) alteration of the level of consciousness; and c) systolic blood pressure of ≤ 100mmHg [6]. Each variable represents a point, reflecting on a score of zero to three. Thus, a score equal to or greater than two indicates a risk of mortality or prolonged stay in the ICU unit [6].

The aim of the analysis was to identify the prevalence and characterize the patients burned with sepsis at the Burn Treatment Center.

The research complied with the guidelines set forth in resolution 466/2012 of the National Health Council / Ministry of Health (CNS / MS), was registered in the Brazil Platform for submission to the Research Ethics Committee (CEP), under the number of opinion 2,181. 603, adopted on July 21, 2017.

Results

A total of 120 records were analyzed, corresponding to the number of hospitalizations during the collection period. Of this total, 23 medical records met the inclusion criteria corresponding to a prevalence of sepsis of 19%. The data were then analyzed according to the variables related to the characterization of the patients.

Table 1 - Characterization of burned patients with sepsis in a burn treatment center. Rio de Janeiro, 2017. (n = 23)

Features	N	%
Gender		
Male	9	39
Female	14	61
Age		
> 60 years old	9	39
< 60 years old	14	61
Length of hospital stay		
> 60 days	10	43
30 to 60 days	9	39
< 30 dias	4	18
Burnt body surface		
> 30%	10	43
20 a 30%	5	22
< 20%	8	35
Output condition		
Discharge	19	83
Death	4	17

Source: research data.

In the age variable, it was observed that 61% (n = 14) of the patients were younger than 60 years and there was a greater frequency of the female 61%; (n = 14).

When the length of stay was taken into account, 43% (n = 10) of the patients had hospitalization time greater than 60 days and that 18% (n = 4) had less than 30 days of hospitalization, where the mean length of hospital stay was 57 days.

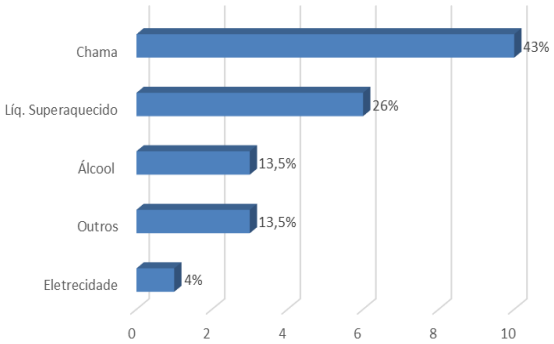
When analyzing the variable related to burned body surface area (SCQ), 35% (n = 8) were of patients who presented up to 20% SCQ and 43% (n = 10) were patients who presented more than 30% of SCQ.

It is noteworthy that among the 23 patient files that were analyzed, 19 patients were discharged from hospital and 4 patients died.

In relation to the degree of burn, those of 2nd degree were more frequent, with 70% (n = 23). It should be noted that the variable "degree of burn" has a larger quantitative (n = 33) because some patients presented more than one degree of burn during hospitalization time. Being still observed that 100% of the patients presented / displayed burns of 2nd degree.

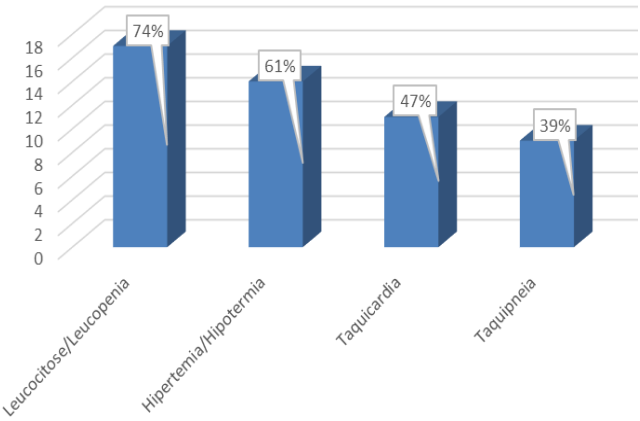
When analyzing the burn agent, 43% (n = 10) had the flame as the cause, 26% (n = 6) had as cause the superheated liquid and 4% (n = 1) had the electricity cause.

Figure 1 - Burn agent in patients with sepsis at a burn treatment center. Rio de Janeiro, 2017. (n = 23)



After analyzing the associated comorbidities, 20% (n = 6) reported hypertension, 17% (n = 5) epilepsy, 10% (n = 3) depression, 3% (n = 1) diabetes mellitus and 37% 11) do not present comorbidities.

Figure 2 - Clinical signs of sepsis in patients burned at a burn treatment center. Rio de Janeiro, 2017. (n = 23)



When the clinical signs of sepsis developed by the patients were analyzed, 74% (n = 17) presented leukocytosis / leukopenia, 61% (n = 14) presented hyperthermia/hypothermia, 47% n = 11) presented tachycardia, and 39% = 9) presented tachypnea.

Figure 3 - Criteria for the QSOFA score for the detection of sepsis in burn patients in a burn treatment center. Rio de Janeiro, 2017. (n = 23)

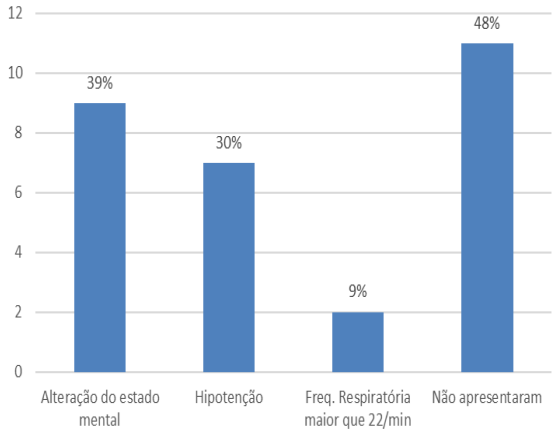


Figure 3 analyzes how often the qSOFA score criteria were identified in the 23 selected patients. It was observed that 12 patients had at least one criterion of the QSOFA score during hospitalization, with a higher frequency of mental status with 39% (n = 9), hypotension with 30% (n = 7), respiratory rate higher than 22 / min with 9% (n = 2) and 48% (n = 11) did not present criteria of the qSOFA score. In addition, the number of qSOFA criteria presented by each of the 12 patients who presented qSOFA criteria, 7 patients presented one criterion, 4 patients presented two criteria and 1 patient presented three criteria of the qSOFA score.

Discussion

When analyzing the prevalence of sepsis in the burned patient in a CTQ in the year 2016, a value of 19% corresponding to the 23 patients who presented the inclusion criteria was obtained. This result corroborates with studies that presented a prevalence rate of sepsis of 19.4% and 23.1%, respectively [3, 9].

The results show that the majority of patients with sepsis are under 60 years of age and justified by the fact that this age group is in the productive period of life, where certain work activities put the workers in greater exposure to burn.

When analyzing the results it is observed that the development of sepsis is greater in the female gender, similar to the other study10, in which 56.7% belong to the female sex. This group is more susceptible because they are still larger in relation to the male gender in activities involving domestic activities, such as: handling of boiling water and inflammable household products.

When the burned body surface was evaluated, it is noteworthy that 43% of the patients presented a burn extension greater than 30%. Due to the destruction of the skin the burned patient presents greater susceptibility to the development of infection, and consequently of sepsis, when not diagnosed and treated correctly. In an epidemiological study, burns up to 30% were the most frequent with 27% of the reported cases[11].

When considering the length of hospital stay, 43% of the patients remained hospitalized for an average of 53 days. Possessing a higher average when compared to another study12, which obtained an average of approximately 14.1 days. In view of the difference in the results regarding hospitalization time, it can be concluded that the patients admitted to the CTQ had a higher

severity, susceptibility to infections and complications such as sepsis, requiring care in a specialized setting.

Although the burned patient presented a severe condition, being vulnerable to complications such as sepsis, due to the pathophysiology of the burn, only 4 (17%) patients died. In other characterization studies of burned patients we observed a mortality rate above 60%, but when analyzing the age of these patients, 76% respectively were older than 60 years, which increases the possibility of a negative prognosis compared to the younger patient burn victim [10-9].

When analyzing the depth of the lesion, all the patients in the present study presented 2nd degree burns, corroborating the studies12-13, in which there was also a higher occurrence of 2nd degree burns, affecting 45.3% to 62% of the patients. patients respectively.

It is worth noting that knowing the depth of the burn, the healing processes and the appropriate treatment, with regard to the cleaning and the choice of cover may offer assistance with shorter hospitalization time and greater safety.

As for the agent of the burn, other studies also highlighted as superheating agents the superheated liquid (44%) (23%) and the flame (26%) [14, 15]. One study highlights that burns caused by fire are generally more extensive and deeper, which may increase the risk of sepsis[3].

It should be taken into account that these findings may be related to the population's lack of knowledge about the safe handling of the flame. It should also be considered that in addition to the burn caused by the flame, other effects such as inhalation of the smoke can aggravate the picture and be even more harmful in the recovery of the patient.

When considering the associated clinical comorbidities, the most frequent were hypertension (20%), epilepsy (17%) and depression (10%). Hypertension is a risk factor for the development of cerebrovascular diseases, contributing to the increase in mortality, also gaining prominence in another study, with 16.5%[9].

In addition to hypertension, diseases such as epilepsy and depression require the nurse to follow more actively and involve the family in relation to psychological needs, since burns can bring variable emotional responses.

Regarding the clinical characteristics of sepsis, it is important to note that sepsis is a set of serious manifestations throughout the body produced by an infection, one of the main features being the changes in the blood cells responsible for defense, which are leukocytes. Research indicates that one of the main manifestations, leukocytosis, is present in 67.5% and 48.4% of patients with sepsis [16-17].

Another research deals with thermoregulation related to the development of sepsis, bringing the clinical manifestations

of hyperthermia and hypothermia, as quite frequent. It is known that changing body temperature regulation is one of the most common signs of sepsis. In which much has been discussed about induction by vasoactive enzymes in the production of nitric oxide, being responsible for the alteration of body temperature values in patients with sepsis [18].

In front of the burned patient, the nurse must be attentive to temperature monitoring, due to the loss of self regulation capacity, the loss of skin that has thermoregulation as one of its main functions. Associated with this, some drugs with considerable toxicity may contribute to organ dysfunction in critically ill patients [19].

Also cited by the Latin American Sepsis Institute as clinical signs of sepsis development, we can mention: platelets <100,000, oliguria or creatinine> 2m / dL, bilirubin> 2 times the reference value [16-20].

Compared with the main clinical manifestations of another study, it was observed that, in the majority of cases, they were similar, but with different frequencies, where the most frequent signs were: tachycardia with 88.5%, tachypnea with 79.2%, and hypothermia with 75.2% [17].

When applying the qSOFA score in the studied sample, it was identified that of the 23 patients selected, only 5 were diagnosed with sepsis. Considering this result, it is possible to reflect on the low applicability of the QSOFA score for the studied reality and for places with few resources. In this same sense, the Latin American Sepsis Institute criticizes the new concepts, which limit the criteria for the presence of organic dysfunction and ultimately select only a more seriously ill population[20].

In view of the possibility of delaying therapy, the use of the criterion to identify patients with sepsis should be evaluated, as the improvement processes will not be altered21. In addition, it is important to establish a score compatible with the clientele, since for burned patients, with the characteristics identified in this study, the QSOFA score was not the best indicator.

CONCLUSION

The prevalence of sepsis in the burned patient at the burn treatment center was 19%, demonstrating the need to implement protocols for identification and preventive measures for the control of sepsis.

The most frequent clinical characteristics of patients who developed sepsis were: age less than 60 years, female gender with burned body surface area above 30% and length of hospital stay longer than 60 days. The most frequent burn agents were flame and overheated liquid, in which all the patients had 2nd degree burns and most of them had a positive outcome (hospital discharge).

The main limitation of the study was related to the small number of medical

records selected, which may be justified by the high underreporting rate of sepsis.

In view of the consequences of sepsis in the burned patient, this study is important, in the sense of trying to reduce the high mortality rate associated with sepsis in the burned patient. It is demonstrated the importance of the role of the nurse in infection control, since it is the professional who maintains greater contact with the patient, mainly in the evaluation of the wound.

This study may also contribute to the dissemination of knowledge in an area that is still scarce, little discussed and extremely specific. In addition, measuring the prevalence of sepsis and characterizing this population can contribute to the improvement of care plans targeting the burned patient in order to prevent infection.

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