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Original Article

Characteristics of patients with sepsis and/or septic shock admitted to an adult intensive care unit*

Características de pacientes com sepse e/ou choque séptico internados em unidade de terapia intensiva adulto

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ABSTRACT

Objective: to analyze the epidemiological and clinical characteristics of patients diagnosed with sepsis and/or septic shock admitted to an intensive care unit. **Methods:** this was a retrospective observational study with documentary data collection, carried out by accessing the medical records of patients diagnosed with sepsis and/or septic shock in an intensive care unit. Data were collected using a semi-structured form, followed by descriptive and bivariate analyses and Poisson regression. **Results:** 188 medical records were analyzed, 77 (41%) of patients diagnosed with sepsis and 111 (59%) with septic shock, the majority (n=99; 52.7%) with a respiratory focus. The majority were male (n=106; 56.4%), with an average age of 57.9 years. Mean arterial pressure <65mmHg and creatinine >2mg/dl were significantly associated with death. **Conclusion:** sepsis and septic shock were more prevalent in males of advanced age who had comorbidities and behavioral risks. Death was more common in patients with hypotension and elevated creatinine. **Contributions to practice:** this study reinforces the importance of identifying patients at risk of sepsis and/or septic shock early. Identifying associated factors can help prioritize care and formulate targeted clinical protocols, optimizing the management of these conditions.
Descriptors: Sepsis; Intensive Care Units; Nursing; Epidemiology.

RESUMO

Objetivo: analisar as características epidemiológicas e clínicas de pacientes diagnosticados com sepse e/ou choque séptico internados em uma unidade de terapia intensiva. **Métodos:** estudo observacional retrospectivo, com coleta de dados documental, realizado com acesso a prontuários de pacientes com diagnóstico de sepse e/ou choque séptico de uma unidade de terapia intensiva. Dados coletados com um formulário semiestruturado, seguido de análises descritivas, bivariadas e regressão de Poisson. **Resultados:** analisaram-se 188 prontuários, 77 (41%) de pacientes com diagnóstico de sepse e 111 (59%) de choque séptico, a maioria (n=99; 52,7%) com foco respiratório. Maior parcela do sexo masculino (n=106; 56,4%), com média de 57,9 anos. Pressão Arterial Média <65mmHg e creatinina >2mg/dl foram associadas significativamente ao desfecho óbito. **Conclusão:** a sepse e o choque séptico estiveram mais presentes em pessoas do sexo masculino, com idade avançada e que possuíam comorbidades e riscos comportamentais. O desfecho óbito foi mais presente em pacientes com hipotensão e creatinina elevada. **Contribuições para a prática:** este estudo reforça a importância da identificação precoce de pacientes com risco de desenvolver sepse e/ou choque séptico. A identificação de fatores associados pode auxiliar na priorização de cuidados e formulação de protocolos clínicos direcionados, otimizando o manejo destes agravos.
Descritores: Sepse; Unidades de Terapia Intensiva; Enfermagem; Epidemiologia.

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Introduction

Sepsis has been considered a public health problem by the Latin American Sepsis Institute, as many patients diagnosed with the disease not only require Intensive Care Unit (ICU) beds but also have high morbidity and mortality rates[1-2]. Sepsis, considered one of the 10 most deadle diseases worldwide, affects approximatele 31 million people each year globally, resulting in around 5.3 million deaths. In the most severe cases, fatality rates range from 30 to 45%[3-4].

The Third International Consensus of Definitions on sepsis and septic shock defines sepsis as the manifestation of life-threatening organ dysfunction resulting from the body's response to an infection, in which the focus may or may not be evident, associated with organ dysfunction, hypoperfusion, and hypotension[2,5]. Consequently, sepsis can progress to septic shock, a condition that represents a subsequent stage of sepsis. This condition is characterized by impairment of the circulatory, cellular, and metabolic systems, often requiring the use of vasopressor drugs. These alterations substantially increase the mortality rates associated with the clinical picture[2,6].

Given the above, it is essential to provide agile and correct care, with early detection of the signs and symptoms of sepsis, to prevent the disease from worsening and thus increase patients' chances of survival[7-8]. In line with this perspective, Brazil has adhered to the international guidelines of the Surviving Sepsis Campaign, which recognizes the early signs and symptoms of sepsis and the importance of appropriate and rapid treatment to minimize the severity of the disease and reduce mortality rates[1,9].

To make the early identification of sepsis feasible, scientific literature provides several guidelines on the best practices for achieving significant results in restoring the health of these patients[5]. In these cases, the importance of using a protocol for treating sepsis and its correct application is relevant, as it provides early recognition of the clinical manifestations caused by the infection, enabling the implementation of essential and appropriate interventions[6].

The detailed characterization of these ICU patients helps us understand the variables that influence unfavorable outcomes, such as comorbidities, time of treatment initiation, associated microbiology, and the therapeutic strategies used[6-7]. According to some studies, knowing patients' demographic, clinical, and microbiological characteristics is essential for personalizing intensive care and developing more effective strategies for preventing and treating sepsis and septic shock in critical environments[7,10-11].

Given this, it is essential to know the epidemiological profile of ICU patients to reduce the scarcity of current information on the subject. This data collection will help to create protocols and systems to improve care for patients with sepsis/septic shock. As a result, there could be an improvement in the characterization of the disease, with a targeting of resources, a reduction in costs, faster diagnosis, and better treatment and prognosis. This study aimed to analyze the epidemiological and clinical characteristics of patients diagnosed with sepsis and/or septic shock admitted to an intensive care unit.

Methods

This is a retrospective observational study with documentary data collection. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) *checklist* was used to guide the reporting of this investigation.

The research was carried out in a general ICU of a university hospital in southern Brazil. It currently has six general beds and one for isolation cases, and it cares for patients with a wide range of clinical conditions. The unit provides multi-professional care and is a reference hospital for several cities, with an annual average of 220 patients admitted.

The data accessed covered the period from January 2019 to December 2020 (two full years). Eligible records were those of adult patients who were diagnosed with sepsis and/or septic shock in the period under investigation, and who were treated in

the setting as mentioned earlier. Medical records with missing data were excluded from the study, thus constituting an intentional census sample of 188 medical records.

The access to hospital record data (medical charts) was conducted from May to July 2021. Initially, a list was created by reviewing all patients admitted to the general ICU during that period, totaling 437 individuals. From this list, a detailed search was performed in both physical and digital charts to verify the medical diagnosis of sepsis and/or septic shock. Once the list was finalized, data collection began using a semi-structured form specifically designed for this purpose.

Data was collected by a nurse specializing in intensive care with experience in the area and subject matter. Based on the literature and the researchers' knowledge, a semi-structured form specific to this study was used (no instrument pilot test was carried out).

The following data was extracted from the form: sociodemographic data (registration number, date of birth, age, color, gender and marital status); hospitalization data (date of admission to hospital and ICU, allergies, origin, previous morbidities, initial hospitalization diagnosis, sepsis classification, sepsis focus, outcome and length of stay); procedures performed (invasive mechanical ventilation, days of orotracheal intubation, tracheostomy, use of central venous access, bladder catheterization, total parenteral nutrition, enteral diet, use of mean arterial pressure (MAP) and hemodialysis catheter; clinical data (general, hemodynamic, tissue perfusion and inflammatory signs and symptoms); laboratory tests (blood culture, blood count, platelets, urea, sodium, blood gases, hemoglobin, leukocytes, bilirubin, potassium, lactate, hematocrit, creatinine, glutamic-oxaloacetic transaminase, glutamic-pyruvic transaminase and albumin); medications used (antibiotics in the first hour, use of another antibiotic, volume replacement in the first hours, blood transfusion, sedation, vasopressors).

The data collected was entered into Excel spreadsheets, double-checked to identify possible inconsistencies, and analyzed using SPSS version 22.0.

The relevant variables for the early detection of sepsis[1-2] are described below, all of which were collected from the medical records and used in the univariate analysis to identify which could be associated with the outcome of death in the sample investigated. The probable or confirmed presence of these variables in patients helps or confirms the diagnosis of early sepsis. They are systolic blood pressure (SBP); MAP; recorded urine frequency and volume; presence of oliguria; creatinine; partial pressure of oxygen (PaO2); fraction of inspired oxygen (FiO2); PaO2/FiO2 ratio; oxygen saturation (SpO2); platelet levels or count; lactate levels; bilirubin levels; level of consciousness, agitation, delirium; core temperature; axillary temperature; heart rate; respiratory rate; total leukocyte count.

After surveying the sample's profile, a univariate analysis was carried out, based on the clinical variables assessed in patients at risk of sepsis, to analyze the association with the outcomes of death or discharge in this sample.

The variables were described with absolute and relative frequencies when categorical and represented by mean and standard deviation when numerical. Normal distribution was assessed using the Kolmogorov-Smirnov test. Bivariate analysis was carried out using the Chi-square test or Student's t-test, depending on the class of the variables, continuous or categorical. The variables that resulted in $p<0.20$ in the bivariate analysis (gender, age (years), mean arterial pressure lower than 65mmHg, axillary temperature <36ºC, agitation, creatinine>2mg/dl, and bilirubin>4mg/dl) were included in a multivariate model developed using Poisson regression. Prevalence ratios (PR) were verified, with their 95% confidence intervals (CI). The results were considered statistically significant when the probability of error α was <0.05.

The Research Ethics Committee of the Catholic University of Pelotas approved the research under Opinion No. 4,642,511/2021, Certificate of Submission for Ethical Appraisal No. 40728920.9.0000.5339. The study followed the principles established in Re-

solutions 466/12 and 510/16, respecting the ethical guidelines applicable to scientific research involving human beings.

Results

Among the 437 patients admitted to the general ICU between 2019 and 2020, 188 (43%) were diagnosed with sepsis or septic shock. The average age of the patients was 57.9, and the majority were males. Table 1 shows the sample's sociodemographic and health data.

Table 1 – Sociodemographic and health characteristics of patients admitted to the Intensive Care Unit (n=188). Rio Grande, RS, Brazil, 2021

Variables	n (%)
Race/color	
White	107 (56.9)
Not informed	59 (31.4)
Brown	12 (6.4)
Black	9 (4.8)
Indigenous	1 (0.5)
Marital status	
Single	71 (37.8)
Not informed	54 (28.7)
Married	43 (22.9)
Widowed	11 (5.9)
Divorced	9 (4.8)
Lifestyle	
Tobacco user	60 (31.9)
Alcoholic	29 (15.4)
Drug user	19 (10.1)
Place/unit of referral	
Emergency services	56 (29.8)
Services outside the institution	37 (19.7)
Medical clinic unit	36 (19.1)
Services outside the municipality	33 (17.6)
Operating room	17 (9.0)
Surgical clinic unit	7 (3.7)
Obstetric center	2 (1.1)
Anthropometric measurements	Average ± Standard deviation
Weight (kg)	75.2 ± 19.4
Height (cm)	168.0 ± 10.6
Body Mass Index (kg/m^2)	26.7 ± 7.3

Most of the patients were single, white, with an average BMI of 26.7 kg/m^2, and 108 (57.4%) used drugs, smoked, or drank. In addition, almost a third of the patients had been referred to by the hospital's own Emergency Department and stayed an average of 12.8 (±14.2) days in the hospital.

Table 2 shows that the most common procedures performed were bladder catheterization, central venous access, and mechanical ventilation. 77 (40.1%) patients were diagnosed with sepsis, and 111 (59%) with septic shock. Of these, respiratory infections stood out.

Table 2 – Procedures performed on patients, the classification and focus of sepsis identified in patients admitted to the Intensive Care Unit (n=188). Rio Grande, RS, Brazil, 2021

Variables	n (%)
Procedures performed during hospitalization	
Vesical catheterization	186 (98.9)
Central venous abscess	177 (94.1)
Mechanical ventilation	165 (87.8)
Enteral diet	139 (73.9)
Blood transfusion	105 (55.9)
Access for hemodialysis catheter	74 (39.4)
Performing hemodialysis	71 (38.4)
Invasive access to mean arterial pressure	67 (35.6)
Tracheostomy	54 (28.7)
Volume replacement	
In the first hour of hospitalization	143 (76.1)
Effective: Mean arterial pressure >65 mmHg without vasopressors	34 (23.8)
Classification of sepsis/septic shock	
Septic shock	111 (59.0)
Sepsis	77 (40.1)
Focus of sepsis	
Respiratory system	99 (52.7)
Multiple spotlights	44 (23.4)
Genitourinary system	15 (8.0)
Surgical focus	11 (5.9)
Skin	9 (4.8)
Non-specific focus	7 (3.7)
Cardiovascular system	3 (1.6)
Microorganism detection test	
Positives	124 (66.0)
Negatives	64 (34.0)

Table 3 describes the signs and symptoms presented by the patients during their stay in the Intensive Care Unit.

Table 3 – General signs and symptoms presented by patients during their stay in the Intensive Care Unit (n=188). Rio Grande, RS, Brazil, 2021

Variables	n (%)
Axillary temperature	
Axillary temperature >38°C	119 (63.3)
Only hyperthermia ≥38°C	91 (48.4)
Axillary temperature <36°C	55 (29.3)
Absence of hypo/hyperthermia ≥36 and <38°C	42 (22.3)
Presence of hypo/hyperthermia <36 and ≥38°C	28 (14.9)
Only hypothermia <36°C	27 (14.4)
Cardiovascular system	
Mean arterial pressure <65 mmHg	171 (91.0)
Heart rate >90 bpm*	150 (79.8)
Respiratory system	
Respiratory rate >20 rpm†	149 (79.3)
$PaO^2/FiO^{2‡}$ ratio<300 mmHg	85 (45.2)
Cardiac output >8 L/min	19 (10.1)
Neurological system/level of consciousness	
Glasgow <12	59 (31.4)
Agitation	9 (4.8)
Delirium	6 (3.2)
Laboratory tests	
Reactive Protein C >20 mg/dl	178 (94.7)
Total leukocytes >12,000 mm^3	166 (88.3)
Lactate >1 mmol/L	141 (75.0)
Creatinine >2 mg/dl	104 (55.3)
Platelets <100,000 mm^3	43 (22.9)
Glycemia ≥200 mg/dl	32 (17.0)
Bilirubin total >4 mg/dl	25 (13.3)
Clinical conditions	
Edema	68 (36.2)
Decreased capillary filling	61 (32.4)

*Heartbeats per minute; †Respiratory movements per minute; ‡Relation between partial pressure of oxygen in arterial blood (PaO2) and fraction of inspired oxygen (FiO2)

Two-thirds of the patients had hyperthermia >38ºC, a very significant number had a heart rate >90 bpm, and almost half developed hypoxemia. 88.3% (n=166) had an increase in leukocytes >12000 mm^3. In addition, in three-thirds of the patients, lactate was >1 mmol/L, and in 94.7% (n=178), C-reactive protein was >20 mg/dl.

The bivariate analysis (Table 4) identified two variables significantly associated with death: MAP<65 mmHg and creatinine levels>2 mg/dl. There was also a difference of 12 additional percentage points for patients with MAP<65 mmHg and a greater tendency for high creatinine levels to be associated with higher death rates.

Table 4 – Univariate analysis of clinical variables indicated by the Latin American Sepsis Institute as predictors of risk for sepsis (n=188). Rio Grande, RS, Brazil, 2021

Variables	High (n=96)	Death (n=92)	p-value*
Cardiovascular system			
Mean arterial pressure <65 mmHg	82 (85.4)	89 (96.7)	0.014
Heart rate<90 mmHg	21 (21.9)	17 (18.5)	0.691
Axillary body temperature			
>38ºC	61(63.5)	58(63.0)	1.000
<36ºC	33(34.4)	22(23.9)	0.157
Respiratory system			
PaO2/FiO2† ratio <300 mmHg	42(43.8)	43(46.7)	0.791
Respiratory rate<20 rpm‡	17(17.7)	22(23.9)	0.385
Neurological system/level of consciousness			
Glasgow<12	30(31.3)	29(31.5)	1.000
Agitation	2(2.1)	7(7.6)	0.152
Delirium	2(2.1)	4(4.3)	0.64
Laboratory tests			
Total leukocytes>12,000 mm^3	83(86.5)	83(90.2)	0.566
Lactate>1 mmol/L	73(76.0)	68(73.9)	0.866
Creatinine>2 mg/dl	38(39.6)	66(71.7)	< 0.001
Platelets<100,000 mm^3	19(19.8)	24(26.1)	0.393
Bilirubin>4 mg/dl	9(9.4)	16(17.4)	0.161

*Chi-Square test; †Relation between partial pressure of oxygen in arterial blood (PaO2) and fraction of inspired oxygen (FiO2); ‡Breathing movements per minute

The multivariate analysis of the Poisson regression model for parameter estimates is shown in Table 5.

Table 5 – Results of the Poisson regression model for parameter estimates (n=188). Rio Grande, RS, Brazil, 2021

Variables	B* ± SE†	p-value‡	PR§ (CI‖95%)
Male gender	0.3 ± 0.21	0.890	1.3 (0.68 – 1.57)
Age (years)	-0.01 ± 0.01	0.370	0.99 (0.98 – 1.01)
Mean arterial pressure <65 mmHg	1.14 ± 0.60	0.060	3.14 (0.97– 0.14)
Axillary temperature <36°C	-0.27 ± 0.25	0.270	0.76 (0.47 – 1.24)
Agitation	0.63 ± 0.40	0.120	1.87 (0.85 – 4.11)
Creatinine >2 mg/dl	0.67 ± 0.24	0.010	1.95 (1.22 – 3.11)
Bilirubin >4 mg/dl	0.38 ± 0.28	0.170	1.46 (0.85 – 2.53)

*Regression coefficient; †Standard Error; ‡Omnibus test; §Prevalence ratio; ‖Confidence interval

Creatinine remained significant, and the regression coefficient (B) ± standard error increased by 0.67±0.24 for creatine values above 2 mg/dl, with a higher prevalence ratio (PR) of 1.95 units more for the death outcome. Compared to creatinine values below 2 mg/dl, the PR variation was between 1.22 and 3.11 units. Creatinine is the only variable in this sample that was associated with higher death rates, even after adjusting for confounding variables such as gender and age.

Discussion

Sepsis is a serious health problem worldwide, and in Brazil, it is a significant challenge for public policies[5]. The increase in this syndrome emphasizes the factors contributing to its occurrence[12]. As it is a condition responsible for numerous admissions and deaths in ICUs, it increases these patients' hospital stays and institutional costs[9,13]. For this reason, it is essential to carry out situational diagnoses on this subject.

At a national level, we can see that when it comes to sepsis, the number of deaths is exceptionally high. A population of 462,000 patients[5] corroborated new findings. Supported by a further population of 419 patients[11], revealing that patients with sepsis/septic shock occupy a third of the available ICU beds, with a mortality rate of 40% and 65%, respectively[14].

This study revealed a high rate of sepsis prevalence and mortality due to sepsis and septic shock. These epidemiological data are close to other realities. This scenario reinforces the need for early diagnosis and control of worsening sepsis, as the chances of a favorable clinical outcome are greater in patients in the early stages of the disease[2-3]. The southern region of Brazil ranks second in the number of deaths from this syndrome[5,9].

The sociodemographic data of the total sample in this study were similar to those found in the national[4,6-7,9-10] and international[15] literature, with a prevalence of males, except for some findings that claim a prevalence of females[16]. Based on this, there is a need to develop strategies that focus on the prevention and treatment of sepsis, considering the nuances of each sex. Men have a history of seeking health services less and not adhering as firmly to treatment as women, as well as abusing alcohol and tobacco more, factors which aggravate various diseases[4,17].

In the survey of hospitalizations by age group, the average age of patients admitted to the ICU was 57.9 years, and half of the patients admitted were aged 60 or over and had a high mortality rate, which is in line with several other findings[11,14-15]. This occurs because elderly people have reduced immunity and many comorbidities, making them more susceptible to developing infectious processes[7]. On the other hand, there is evidence that patients under 65 are responsible for 73.5% of all ICU admissions[4].

When analyzing the race/color variable, white people dominated, followed by brown and black people, and similar results were obtained[12]. However, some findings claim that the brown population is the most affected by this disease. This statement may have been influenced by the geographical location of the places where the studies were carried out[9,16].

Most of the patients studied were admitted to the ICU because of sepsis, followed by respiratory complications. It is worth noting that the hospital studied receives patients from all state regions through the "zero vacancies" program, usually in severe con-

ditions, with different pathologies and the need for multiple interventions and intensive monitoring. In this sense, this study found many patients who used invasive mechanical ventilation and required the use of catheters and invasive devices, data corroborating other studies[18].

The use of mechanical ventilation in septic patients can have an impact on improving their prognosis, but if it is not carried out properly, it can cause serious injuries[4]. For this reason, mortality is mainly related to the length of stay in the ICU and the use of invasive procedures. About the length of stay of the patients, the data analysis showed that more than half of the patients remained in the unit for more than seven days. In the same context, the average length of stay of patients with sepsis in the ICU is 7.1 days[9], and the longer the stay, the greater the chances of developing serious infections and dying[9,14].

In the present study, the warning signs of sepsis were investigated, and most of the patients had an elevated heart rate, respiratory rate, and axillary temperature, showing that the clinical changes caused by sepsis reflect the severity and the body's response to the systemic inflammatory process that is taking place. About MAP <65 mmHg, which was observed in almost all the patients, is explained by the high rate of use of vasoactive drugs. In addition, there was a high rate of patients who had altered laboratory tests, which could characterize an infectious process due to sepsis, causing a systemic inflammatory response that could affect multiple organs and worsen the prognosis. Similar data have been noted, emphasizing the importance of a well-designed protocol for assessing these patients from the start of their hospitalization[17].

Therefore, early detection and correct management of these signs and symptoms are essential for a good prognosis for patients suspected of having sepsis. All the hemodynamic variables surrounding these patients must be constantly observed since the slightest sign of alteration in any of them can indicate sepsis. However, treatment must be based on the patient, not just on these symptoms, and sepsis must not be ruled out simply because of its absence[18].

It was also found that lung infections were predominant, followed by multiple foci[15]. This analysis was like others[4]. Still, according to some authors, the infectious process of the respiratory tract is one of the leading causes of infection, along with invasive devices and prolonged hospitalization. Still, these conditions alone do not prove sepsis[19].

Regarding diagnostic tests, blood culture stands out in clinical practice as the gold standard for diagnosing the etiological agent. However, almost half of the patients analyzed did not have a blood culture taken, a result that differs from this study, in which 66% of hospitalized patients had a blood culture taken[20]. Identifying pathogens is essential for targeted antibiotic therapy, and even the absence of bacterial growth does not exclude the diagnosis since it is also based on the clinical picture and the set of all the alterations[17]. Furthermore, the blood cultures carried out showed a predominance of infections caused by Gram-negative bacteria, which is in agreement[19].

According to the principles of the Sepsis Survival Campaign, the variables of organ dysfunction that should be observed in patients at risk of sepsis or sepsis were found in most of the patients in the study. That is why professionals must monitor ICU patients for signs of hypoxemia, increased creatinine, and platelet count. These findings are similar to those of other studies[17-19], showing that the earlier the signs of sepsis are noticed, the better the patient's clinical prognosis will be.

From this perspective, two variables were associated with death: MAP <65 mmHg and creatinine levels > 2mg/dl, which aligns with the findings of the Latin American Sepsis Institute[1,21]. Focusing on the data analyzed, we can see the importance of implementing programs and protocols to help institutions create appropriate conduct to provide faster and more efficient care to these patients, minimize adverse consequences, and ensure favorable treatment outcomes[20-22].

Creatinine was associated with higher death rates in the sample investigated, which reveals the need to pay attention to warning signs and symptoms, such

as diuresis below 0.5mL/kg/h for more than 2 hours and creatinine above 2.0mg/dl. Data shows that of the 63 patients admitted to the hospital, 17 were identified as having acute renal failure, correlating this condition with age, previous comorbidities, length of stay, BMI, and gender[23]. It is, therefore, important to emphasize that the care team should always be alert to any changes in the parameters mentioned above, as they indicate the dysfunction of vital organs for the improvement and survival of our patients[19,21].

Given the above and considering the high mortality rate from sepsis, it is essential to raise awareness of this pathology by creating strategies at regional, national, and global levels, with public health policies aimed at preventing community infections, as well as institutional actions to reduce infections and increase early diagnosis[12]. Implementing these protocols and training professionals to carry out early diagnosis and effective treatment is essential to reduce mortality rates, costs, hospitalization days, and, as a result, a more favorable recovery for the patient[22-23].

The results of this investigation reinforce the need for early recognition of sepsis and its specificities, which are crucial aspects for improving the clinical prognosis of patients, as well as for improvements in the care provided and the implementation of new sepsis prevention strategies. Based on this, it is suggested that future studies consider monitoring the profile of patients from the moment they enter the hospital until their outcome, not just during their stay in the intensive care unit. Furthermore, interventional studies could help identify exposures that contribute to developing sepsis.

Study limitations

This study has some limitations, stemming from its retrospective nature and reliance on medical records as a data source. Some variables could not be collected due to missing information or illegibility of the records. Additionally, certain data were not properly documente dor werw absent, leading to data loss that may heve limited the scope of other analysis or inferences.

Contributions to practice

This study reveals the epidemiological and clinical characteristics of adult patients admitted to the ICU with sepsis/septic shock, showing evidence to help identify risk groups and thus enable early interventions. There is also relevant information that can help in the creation of protocols and targeted treatments to deal with this disease, which has a high prevalence of morbidity and mortality. In addition, the data from this investigation reveals gaps for future research, such as the need for interventional studies.

Conclusion

The profile of adult patients admitted to the intensive care unit with sepsis/septic shock was predominantly male, aged over 60, and with previous comorbidities and behavioral risks, such as the consumption of illicit substances. The prevalence of patients with pulmonary infections who required mechanical ventilation and invasive devices and remained in the intensive care unit for more than seven days was high, reflecting the severity of the cases.

In addition, it was found that the outcome of death was more prevalent in patients with a mean arterial pressure of less than 65 mmHg and creatinine greater than 2 mg/dl, even when adjusting for confounding variables such as age and gender. In addition to changes in essential laboratory tests, such as leukocytes, lactate, and C-reactive protein, which are also important indicators of probable complications and unfavorable prognoses. The importance of monitoring creatinine levels and mean arterial pressure was noted, particularly in patients with sepsis and/or septic shock. These can be used as markers or assist in the eventual identification of worsening patients and thus direct earlier and more effective interventions for the management of sepsis and/or septic shock.

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Authors' contributions

Conception and design or analysis and interpretation of data; drafting of the manuscript or critical review of intellectual content; final approval of the version to be published and responsibility for all aspects of the text in ensuring the accuracy and integrity of all parts of the manuscript: David C, Silva VM, Ventura LS, Silveira JRD, Barlem ELD, Ilha S, Munhoz OL.

References

1. Instituto Latino-Americano de Sepse (ILAS). Relatório de atividades: Ano de referência 2022 [Internet]. 2023 [cited Jan 6, 2025]. Available from: https://ilas.org.br/wp-content/uploads/2023/07/Relatorio-atividades-ILAS-2022.pdf
2. Silva IKM, Silva TA, Lira VRS, Nunes EAT, Barbosa KTF, Xavier AT, et al. Cuidados intensivos de enfermagem ao paciente com sepse: uma revisão integrativa. Enferm Bras. 2024;23(1):1453-62. doi: https://dx.doi.org/10.62827/eb.v23i1.gt21
3. Caetano PDT, Nascimento NJ, Pereira R. Indice de sepse em uti no Brasil e a importância da educação permanente com os profissionais de enfermagem e comunidade sobre sinais e sintomas de sepse. Rev Bras Reabil Ativ Física [Internet]. 2024 [cited Jan 7, 2025];12(2):69-75. Available from: https://estacio.periodicoscientificos.com.br/index.php/rbraf/article/view/2630/2157
4. Tosi RR, Boneto YGR, Santos PS, Moreira CN. Clinical-epidemiological profile of patients admitted with sepsis in an intensive care unit. Rev Contemp. 2024;4(6):e4853. doi: https://dx.doi.org/10.56083/RCV4N6-189
5. Almeida NRC, Pontes GF, Jacob FL, Deprá JVS, Porto JPP, Lima FR, et al. Analysis of trends in sepsis mortality in Brazil and by regions from 2010 to 2019. Rev Saúde Pública. 2022;56:25. doi: https://doi.org/10.11606/s1518-8787.2022056003789
6. Williams CYK, Edimburgo T, Elbers PWG, Thoral PJ, Ercole A. Application of the Sepsis-3 criteria to describe sepsis epidemiology in the Amsterdam UMCdb intensive care dataset. PLoS One. 2024:19(6):e0304133. doi: https://dx.doi.org/10.1371/journal.pone.0304133
7. Macedo PRB, Andrade VSM, Silveira SJS. Análise do perfil epidemiológico da sepse no Tocantins entre 2013-2023. Facit Business Technol J. 2024;53(1):259-76. doi: http://doi.org/10.5281/zenodo.13611044
8. Rüddel DT, Fröhlich H, Schwarzkopf D, Bloos F, Riessen R. Sepsis and underlying comorbidities in intensive care unit patients: analysis of the cause of death by different clinicians-a pilot study. Med Klin Intensivmed Notfmed. 2024;119(2):123-8. doi: http://doi.org/10.1007/s00063-023-01037-4
9. Gobbi LT, Rocha CK, Maciel LT, Costa CP. Epidemiological profile of hospitalizations due to Septicemia: Considerations in anesthetic practice. Braz J Implantol Health Sci. 2024;6(7):2747-60. doi: https://dx.doi.org/10.36557/2674-8169.2024v6n7p2747-2760
10. Dalmolin BL, Martins MFS, Comin MF, Tereza DM, Tessmann M. Profile of patients treated in an intensive care unit of a hospital in Southern Santa Catarina: a comparative analysis of the three years since implementation. Rev Adm Saúde [Internet]. 2023 [cited Jan 10, 2025];23(93):e362. Available from: http://cqh.org.br/ojs-2.4.8/index.php/ras/article/view/362
11. Bittencourt CM, Busanello J, Mocellin LP, Escobal APL, Garcia RP, Pinto DM. Prevalence and factors associated with the sepsis continuum in an adult intensive care unit. Rev Enf Contemp. 2024;13:e5743. doi: https://dx.doi.org/10.17267/2317-3378rec.2024.e5743
12. Santos JV, Araújo MRLL, Toledo MCM, Bomfim LC, Lessa AEC, Santos PRAR, et al. Epidemiological analysis and trends in sepsis mortality in Brazil from 2018 to 2022. Braz J Implantol

Health Sci. 2024;6(8):5148-61. doi: https://doi.org/10.36557/2674-8169.2024v6n8p5148-5161

13. Gondim DGM, Teixeira BL, Mourão CML, Sousa IC. Conhecimento do enfermeiro em protocolo sepse na unidade de terapia intensiva. Rev Facul Paulo Picanço. 2024;4(2):1-14. doi: https://doi.org/10.59483/rfpp.v4n2111

14. Oliveira ESW, Tavares KVST, Reis RB, Pampolim G, Simões GMS. Clinical, sociodemographic profile and outcome of patients admitted to the intensive care unit of a philanthropic hospital in Vitória file of patients admitted to intensive care units. Clin Biopsy. 2023;1(2):124-32. doi: https://doi.org/10.54727/cbps.v1i2.21

15. Rudd KE, Johnson SC, Agesa KM, Shackelford KA, Tsoi D, Kievlan DR, et al. Global, regional, and national sepsis incidence and mortality, 1990–2017: analysis for the Global Burden of Disease Study. Lancet. 2020;395(10219):200-11. doi: https://doi.org/10.1016/S0140-6736(19)32989-7

16. Freire GHE, Machado Filho UM, Machado MOGP, Araujo AK, Martins CFB, Martinez VS, et al. Perfil epidemiológico e tendências temporais das internações por sepse no Brasil: um estudo de 2019 a 2023. Braz J Implantol Health Sci. 2024;6(3):1809-19. doi: https://dx.doi.org/10.36557/2674-8169.2024v6n3p1809-1819

17. Evans L, Rhodes A, Alhazzani W, Massimo A, Craig MC, Craig F, et al. Surviving sepsis campaign: international guidelines for management of sepsis and septic shock 2021. Crit Care Med. 2021;49:e1063–e1143. doi: http://doi.org/10.1007/s00134-021-06506-y

18. Costa BI, Amorim ME, Guimarães MAR, Teles GAM, Silva LG. Care for critical patients with sepsis. Rev Ibero-Am Hum Ciênc Educ. 2023;9(6):1262-73. doi: https://doi.org/10.51891/rease.v9i6.10191

19. Mariano DR, Pereira JS, Garcia GF, Mascarenhas CB. Profile of patients with sepsis and septic shock in a trauma hospital: cross-sectional study. Enferm Foco. 2022;13:e-202255. doi: https://doi.org/10.21675/2357-707X.2022.v13.e-202255

20. Santos CL, Rufino RD. Atuação da enfermagem frente ao protocolo de sepse. RMS. 2024;6(2):170-8. doi: https://doi.org/10.37115/rms.v6i2.732

21. Luquetti CM, Balduino FS, Flores KS, Souza AB, Faria AOV, Vasconcelos Filho GM, et al. Manejo da sepse e choque séptico na emergência adulto: uma revisão protocolar. J Med Biosci Res. 2024;1(3):1038-49. doi: http://dx.doi.org/10.70164/jmbr.v1i3.186

22. Souza KFF, Melo CAV, Lima DB, Duarte GSN, Costa HKS, Silva MNN. Fatores de risco para sepse e o manejo dos enfermeiros da unidade de tratamento intensivo. Rev Recien. 2023;13(41):432-8. doi: https://dx.doi.org/10.24276/rrecien2023.13.41.432-438

23. Bertollo DP, Gomes ECZ, Ebrahim KC. Análise do perfil epidemiológico e mortalidade de pacientes que desenvolveram insuficiência renal aguda concomitante à sepse enquanto internados em unidade de terapia intensiva. Rev Ibero-Am Hum Ciênc Educ. 2024;9(12):867-75. doi: https://doi.org/10.51891/rease.v9i12.12812