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REVIEW ARTICLE

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ANALYSIS OF THE CLINICAL AND EPIDEMIOLOGICAL PROFILE OF PATIENTS WITH SEPTIC SHOCK: AN INTEGRATIVE REVIEW

Bruna da Silva Barros*¹; Gabriel Cunha Rodrigues²; José Ubiracy Martins Cavalcante Junior³; Omar Angel Azad Borges⁴; Jorgeney Bustillos Rocha⁵; Dayanara Lisseth Bustillos Rocha⁶; Dara Rabaly Bustillos Rocha⁷; Gustavo Roque de Queiroz⁸; Felipe Roque de Assis⁹; Gabriella Bueno Moreira¹⁰; Rebeca Caldas Castilho¹⁰; Guilherme da Costa Valente¹⁰; Andrini Thairini Weisheimer¹¹; Durival de Farias¹²; Viviane dos Santos Vieira¹²; Luiz Felipe Quintão de Sá Marinho¹²; Agatha Ribeiro da Hora Conceição¹² and Bárbara dos Santos Tayt-Sohn¹²

¹Doctor at the Universidade do Grande Rio (UNIGRANRIO); ²Doctor at the Universidad De Aquino – Bolívia; revalidated at Universidade Nacional de Brasília (UNB); ³Doctor at the Faculdade de Medicina de Petrópolis (FMP); ⁴Doctor at the Universidade Privada del Valle Cochabamba – Bolívia; revalidated at Universidade Federal Fluminense (UFF); ⁵Doctor at Universidade Privada del Valle Cochabamba – Bolívia; revalidated at Universidade Nacional de Brasília (UNB); ⁶Doctor at Universidad Privada Abierta Latinoamericana de Cochabamba – Bolívia; revalidated at Universidade Nacional de Brasília (UNB); ⁷Doctor at Universidad Privada Abierta Latinoamericana de Cochabamba – Bolívia; ⁸Doctor at Universidade Iguazu (UNIG); ⁹Doctor at Centro Universitário de Várzea Grande (UNIVAG); ¹⁰Medical Student at the Universidade de Marília (UNIMAR); ¹¹Medical Student at the Universidade Federal do Rio de Janeiro (UFRJ); ¹²Medical Student at the Universidade Iguazu (UNIG)

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*Corresponding author:

Bruna da Silva Barros

ABSTRACT

Introduction: Sepsis can be defined as a life-threatening organ dysfunction caused by a dysregulated host response to infection. This deregulated response of the organism can evolve with circulatory, cellular and metabolic abnormalities that can potentially increase the risk of mortality, being called septic shock. **Objective:** To describe the clinical and epidemiological characteristics of patients with sepsis and septic shock. **Methodology:** To prepare the study, a bibliographic survey was carried out through research in the LILACS, Scielo and MEDLINE databases, using descriptors. Strings were made with the words using the Boolean operator (AND): sepsis AND septic shock AND diagnosis AND pathophysiology. In total, 26 scientific articles published between 2013 and 2023 were selected for this bibliographic review. **Results and Discussion:** In most of the selected studies, there was a delay in clinical diagnosis and only a small percentage of identification of severe cases was effective. Late diagnosis can contribute to an increase in the mortality rate. Regarding comorbidities, cardiological and metabolic stand out, being present in most cases and may contribute to a negative outcome. **Conclusion:** Despite the expressive production of knowledge about pathophysiology and treatment, sepsis still remains an entity of difficult clinical management. Early diagnosis - based on high clinical suspicion - and adequate treatment - including all the aspects mentioned - remain the best guarantee of good evolution for subjects victimized by sepsis.

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INTRODUCTION

The third international consensus (Sepsis-3) defines sepsis as a life-threatening organ dysfunction caused by a dysregulated host response to infection. In clinical terms, sepsis is present when there is a suspected or documented infection associated with its acute increase, greater than or equal to two points in the Sequential [Sepsis-related]

Organ Failure Assessment (SOFA) score, which may indicate an organ dysfunction (Singer, 2016). When suspecting an infectious condition that may increase the risk of prolonged hospitalization, the quick-SOFA (qSOFA) can be quickly applied at the bedside - a screening score that assesses changes in mental status, systolic blood pressure less than or equal to 100 mmHg and respiratory rate greater than or equal to 22 bpm. The presence of at least two of these criteria

points to a higher risk of unfavorable outcomes and may indicate a possible infection in a patient with a suspected infectious condition (Singer, 2016 and Kempker, 2020). Septic shock is a subset of sepsis characterized by marked circulatory, cellular, and metabolic abnormalities that can potentially increase the risk of mortality compared with sepsis alone. In clinical terms, septic shock is present when the patient with sepsis needs to use vasopressor drugs to maintain mean arterial pressure (MAP) at 65 mmHg or more and the serum lactate level is greater than 2 mmol/L in the absence of hypovolemia (Singer, 2016). With septic shock, you have a low survival rate. Survival depends on the patient's age, health and cause of illness, whether the patient had organ failure, and how quickly he received treatment. Without proper treatment within the first hour of symptom onset, approximately 30% to 40% of people with septic shock die (CARVALHO, 2020). People with chronic medical conditions (AIDS, diabetes or leukemia) are at an increased risk of sepsis. Also those who have had recent infections, surgeries, transplants or medical device implants. Septic shock is a condition that can lead to brain damage, lung, heart or kidney failure, gangrene or death. Your treatment should be immediate and is usually done in an Intensive Care Unit (ARAÚJO, 2022 and AGNOLO, 2021). This treatment is started immediately with antibiotics. Intravenous fluids may also be given to rehydrate the patient and help raise their blood pressure. In addition, the patient may receive oxygen through a face mask or a nasal cannula, in addition to orotracheal intubation if necessary (FIGUEIREDO JÚNIOR, 2021). The epidemiology of sepsis and septic shock has been challenging to study for several reasons. This includes changes in diagnostic definitions, as well as a high concentration of sepsis-related studies published in high-income countries, despite a large global burden. The true epidemiology of sepsis worldwide remains a highly debated subject, and more research is needed among low-income countries and high-risk subpopulations. Given this context, the present study aims to identify epidemiological characteristics of patients with sepsis and septic shock.

METHODS

For the construction of the proposed study, a bibliographical survey was carried out, through research in the LILACS, Scielo and MEDLINE databases, using descriptors. Strings were made with the words using the Boolean operator (AND): sepsis AND septic shock AND diagnosis AND pathophysiology. For the selection of scientific articles, the inclusion criteria were used, studies published between 2012 and 2022, related to the theme sepsis and septic shock, in Portuguese and English. Literature review articles, duplicated and with restricted access, prior to 2012 and unrelated to the topic were the exclusion criteria adopted in this study. In total, 36 scientific articles were analyzed, all selected for detailed analysis. 10 articles were excluded after full reading for not meeting the inclusion criteria. The other articles were used for the integrative review.

RESULTS

According to Lohn *et al.*, and Nascimento *et al.* knowledge of the epidemiological characteristics of cases of suspected or confirmed sepsis and septic shock demonstrated that the clinical practice of the professionals involved was not in accordance with the conduct recommended by the campaign sepsis survivors (LOHN, 2021). Nascimento and Alves *et al.*, in an observational study, whose objective was to survey the clinical characteristics of septic patients treated in the ICU, it was observed that in most cases, there was a delay in the clinical diagnosis and only a small percentage of identification of severe cases was effective. Late diagnosis seemed to contribute to an increase in the mortality rate. Regarding comorbidities, cardiological and metabolic stand out, being present in most cases and may contribute to a negative outcome (NASCIMENTO, 2022). A prospective study by Abe *et al.*, however, highlighted that most patients with infection admitted to the ICU met the criteria for sepsis, of which 48% died in less than 7 days. Sehgaill, Ladd and Totapally recently published that the incidence of sepsis

increased and the case fatality rate from sepsis decreased, without a decrease in the overall mortality rate associated with sepsis among hospitalized children. Furthermore, bacterial and fungal organisms associated with pediatric sepsis have changed over these years (ABE, 2020). According to Castro *et al.* Most patients admitted to the Intensive Care Unit are elderly, more frequently in the age group between 71 and 80 years, with comorbidities, mainly cardiovascular diseases (48%), with gender equivalence. As for the evolution, 45.3% were discharged from hospital, 52% died (Maria Larissa Miranda de Castro, 2017). Silva *et al.*, showed that more than half of cancer patients admitted to the ICU had a diagnosis of sepsis or septic shock. The factors associated with the occurrence of this outcome were: coming from the Emergency Room, length of hospital stay of more than seven days, presence of four or more invasive procedures and presence of a primary hematological site (Silva, 2022). Some authors report that early identification of signs and symptoms is of crucial importance for the institution of therapeutic measures that are fundamentally based on volume replacement, antibiotic therapy, use of corticosteroids, anticoagulant treatment, measures to maintain biological viability and nutritional support (Siqueira-Batista, 2016; American College of Chest Physicians, 2013 and Silva, 2014). Westphal argues that patients with clear signs of hypoperfusion should undergo hemodynamic optimization. The restoration of hemodynamic stability based on traditional mechanical variables such as MAP, CVP and urinary output is not sufficient to restore tissue oxygenation and result in benefit in terms of prognosis. Therapeutic guidance based on SvcO₂ and its early normalization results in flow recovery and a significant reduction in mortality. Therefore, monitoring is recommended (Westphal, 2011). About the treatment, The systemic inflammatory response of sepsis, due to circumstances not yet established, may be restricted to a self-limited phenomenon or may progress to more severe conditions, such as severe sepsis, septic shock and dysfunction or failure of one or more organs. Despite the large amount of investigations and reports on SIRS, sepsis and related syndromes in recent years, and the indisputable better understanding of their respective pathogenesis, the initial approach to sepsis continues to be predominantly supportive. In suspected SIRS, if no other major non-infectious event is detected, management should be oriented towards sepsis. That is, in addition to life support measures, when indicated, other measures must be taken according to the severity of presentation of the respective syndrome (Paulo, 2023).

DISCUSSION

Most of the studies record that elderly patients with multiple comorbidities and previous hospitalization represent the largest number of patients who present suspected sepsis. With regard to the predominance of infections in this sense, there is mainly a urinary, pulmonary and abdominal focus (LOHN, 2021; NASCIMENTO, 2022; ABE, 2020). A reduced number of patients assisted by actions advised in the first moments of care were identified, such as administration of high-spectrum antibiotics, blood gas analysis with lactate and collection of blood cultures. Furthermore, these actions were more practiced among patients whose diagnosis of sepsis and septic shock was confirmed (LOHN, 2021; NASCIMENTO, 2022; ABE, 2020; Silva, 2022; American College of Chest Physicians, 2013). Another aspect noted by some authors was that the identification of vital signs during the first patient care had not been described in all the medical records, even if detected in the majority. As for the length of stay, no profound difference was observed between the length of hospital stay of patients diagnosed with sepsis and those affected by infection with organ dysfunction (Paulo, 2023; SEHGAL, 2020). Few studies showed reduced numbers of patients diagnosed with septic shock during hospital admission. The diagnosis was confirmed in some cases due to the worsening of the clinical picture during hospitalization. Despite representing a low percentage, there was a need, for the majority, for an ICU vacancy and evolution to death (OLIVEIRA FILHO, 2022). From reading the articles, the aforementioned authors realized that most of the consultations were marked by delays in the clinical diagnosis, and only a small percentage of identification of severe cases was effective,

contributing to the growth of the mortality rate (LOHN, 2021; NASCIMENTO, 2022; ABE, 2020; Silva, 2022 and BESEN, 2021). Regarding comorbidities, they observed their constant presence in cases of cardiologic and metabolic disorders, which could result in a negative outcome. Therefore, in the understanding of these authors, clinical and epidemiological knowledge can lead to the development of methods for early recognition and follow-up of septic patients, having an impact on their morbidity and mortality (NASCIMENTO, 2022; Siqueira-Batista, 2016 and CHIU, 2021). Some papers postulate that the increased incidence of sepsis may be due to changes in coding and/or documentation practices. This can be attributed to sicker patients being hospitalized, increased survival of patients with complex conditions, and better detection of sepsis (Westphal, 2021; Paulo, 2023; CHIU, 2021; LADD, 2019). Although there was a decreasing trend in the severe sepsis fatality rate during the study period, the sepsis-associated mortality rate from all discharges remained stable or increased. Therefore, the increase in the incidence of sepsis could point to misattribution or overdiagnosis of sepsis due to an emphasis on early recognition of sepsis or an actual increase in sepsis due to an increase in complex medical conditions (Silva, 2014 and Moreira, 2018). Regarding etiological agents, bacteria are not always dangerous. Fungal infections continue to be an important factor in the epidemiology of sepsis, especially in children. *Candida* sepsis is the leading cause of fungal sepsis in some studies (ABE, 2020; Moreira, 2018; Arkader, 2006). Since the introduction of amphotericin B and its use as an antifungal agent since 1958, there has been a decline in mortality from invasive fungemia. Although the case fatality rate for fungal sepsis declined, the overall prevalence of fungal infections remained stable from 2006 to 2012. Invasive aspergillosis had the highest case fatality rate (28.2%) among all other causes of sepsis in the study. This could be due to serious underlying conditions such as immunosuppression and transplantation (ABE, 2020; Moreira, 2018 and Arkader, 2006). Some studies demonstrate that the incidence of sepsis has increased and the fatality rate has decreased among children hospitalized with sepsis in the United States. Current strategies for early recognition and management of sepsis have not had an impact on the fatality rate of meningococemia. For the authors, these findings are important to direct the allocation of health resources and guide the direction of future studies (Stella-Silva, 2007; Procianny, 2020 and Pancera, 2014).

CONCLUSION

Despite the expressive production of knowledge about pathophysiology and treatment, sepsis still remains an entity of difficult clinical management. Possible interventions in the inflammatory response and coagulation - with the aim of reducing morbidity and mortality, as well as improving the prognosis of sepsis - have been extensively investigated. Significant advances - such as early goal directed therapy - have already been achieved, but a wide universe of possibilities remains to be explored. However, the necessary full care for the patient cannot be minimized. In fact, at present, early diagnosis - based on high clinical suspicion - and adequate treatment - including all the aspects mentioned - remain the best guarantee of good evolution of subjects victimized by sepsis.

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