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Nursing care in the prevention and treatment of sepsis in the adult ICU

Assistência de enfermagem na prevenção e tratamento da sepse em UTI adulto

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ABSTRACT

Sepsis is defined as an organ dysfunction resulting from an unregulated response of the immune system to an infectious process. It is characterized as a public health problem, has high lethality and high incidence in Intensive Care Units. The objective of this study was to describe the main preventive conducts and treatment that integrate nursing care in cases of Sepsis in the ICU. This is bibliographic research of a descriptive nature carried out in 2020 in the databases of the Scientific Electronic Library Online (Scielo), Google Scholar and Virtual Health Library. We used 12 articles from 2014 to 2019 that met the inclusion criteria and objectives of the study. It was found that most of the studies evidenced the need for more effective treatment and care, however, little was addressed about the specific conducts to be implemented by nursing professionals. Based on the results obtained, it is possible to infer the need for more scientific technical knowledge on the part of the Nursing team, which evidences the need for qualifications, training and activities of Continuing Education in the sectors.

Keywords: Nursing care, Sepsis, Infection, Prevention.

1 INTRODUCTION

Formerly known as septicemia, sepsis is characterized as an organic dysfunction resulting from the host's dysregulated immune response to an infectious process, which can be caused by bacteria, fungi, viruses, or even protozoa (MORELLO et al., 2019; MELLO et al, 2018)

According to the Latin American Sepsis Institute (2018), it is common among lay people, and even among some health workers, the conception that sepsis can only occur by a generalized infectious process, in which microorganisms are installed and acting on all organs and systems at the same time. However, it is known that such microorganisms can establish themselves in only one place and generate a systemic response to fight infection.

According to COREN-SP (2016), if an individual is diagnosed with an infection, he has chances of developing sepsis. However, there are risk factors related to the host that influence the development of this syndrome, such as advanced age, concomitant chronic diseases, malnutrition and weakness of the patient, the presence of wounds, and also the abusive use of alcohol or illicit drugs (MORTON AND FONTAINE, 2014).

As Westiphal and Lino (2015) point out, the prolonged inflammatory response caused by an infection, as well as the lack of early diagnosis, can quickly evolve to more severe conditions associated with sepsis, such as severe sepsis and septic shock. In severe sepsis, in addition to the signs of inflammatory response manifested by the same clinical patterns of the initial sepsis, there are the signs of organic disorder, with clinical manifestations characteristic of the organs with alterations (COREN-SP, 2016; MORTON AND FONTAINE, 2014). In septic shock, in addition to all the previous characteristics, hypotension is added. However, the perception of sepsis in this phase of shock can be considered late and more difficult to reverse, with more chances of progressing to death. (COREN-SP, 2016; MORTON AND FONTAINE, 2014)

With high incidence and high lethality, sepsis is considered a major public health problem worldwide. Data indicate that each year 600 thousand people develop sepsis in Brazil, the mortality rate is approximately 24.2% for sepsis and 52.2% of deaths refer to septic shock. The estimated incidence rate is 300 cases per 100,000 people (ROCHA et al., 2015; MELLO et al., 2018).

Because it is a severe syndrome, the individual with sepsis should be accompanied and assisted by the Intensive Care Unit (ICU). Rocha et al. (2015) state that approximately 17% of Brazilian ICU beds are occupied by these patients. It is noteworthy the fact that the patient may evolve with sepsis inside the ICU or be transferred to it after diagnostic confirmation. In addition, the high rate of ICU admissions for this cause is responsible for the high financial cost of the sector.

In this context, the role of nursing professionals in the prevention and early recognition of the clinical signs of sepsis is fundamental, since these are the professionals who provide direct and continuous care to patients. (COREN-SP, 2016). Therefore, the nursing team must be attentive and trained to intervene in all situations where there is a risk of infection, and especially in the infectious processes already installed, to control and diagnose sepsis early, in order to avoid septic shock and consequently death. (MELLO et al., 2018).

Thus, the objective of this study is to describe the preventive conducts and treatment that integrate nursing care in cases of Sepsis in the ICU. The relevance of this study is based on the

evident severity and high lethality of sepsis, as well as the need to evidence the main conducts that the nursing team should adopt in the face of the case.

In view of this, the following question arises: What are the conducts that integrate nursing care to patients with sepsis and how to intervene preventively?

This research is justified by the need for a study that identifies the current conducts adopted by the nursing team regarding prevention, early recognition and nursing care in the treatment of sepsis as a way to help reduce the mortality rate due to sepsis in ICU patients.

The present study is a literature review, of a descriptive nature, which presents a critical analysis of the articles chosen that deal with nursing care in the prevention and treatment of sepsis in patients in the adult ICU. The literature review, according to Botelho (2011), can be considered the basis for the construction of scientific knowledge, because it is from it that new theories can be proposed.

The bibliographic survey took place in the period of March 2020 in the database of the Scientific Electronic Library Online (Scielo), Google Scholar and Virtual Health Library (VHL). The articles were selected using the following health descriptors in the research: Nursing Care. Sepsis. Infection. Prevention.

A total of 160 titles and abstracts were read, of which 12 articles were selected. The crossing of titles and references was used to avoid duplication. The selected studies met the following inclusion criteria: articles published in full online, without accessibility restrictions, in Portuguese from 2014 to 2019, which address the theme: Nursing Care in the prevention and treatment of individuals with Sepsis admitted to the ICU. The exclusion criteria were: theses, dissertations, articles written in another language published more than five years ago, which did not answer the objective of the research.

The data were initially selected by reading the titles and abstracts related to the theme of this research and selected those that met the inclusion criteria previously established. Soon after, the full reading of the articles on the theme was performed. And finally, the analysis and synthesis of all the material was carried out considering the objectives proposed by this work.

2 DEVELOPMENT

The titles and abstracts of the articles found were read and those that reflected to be compatible with the objective proposed for this research remained. Subsequently, they were read in full, which made it possible to further restrict the number of studies contemplated to participate

in this study, remaining 12 articles. The extracted information was presented and analyzed according to the profile inherent to each of the selected articles.

According to the years of publication, considering the proposed period, we found studies that contemplated the inclusion criteria in the following years: 2014 and 2016 with 1 article each, 2015, 2017 and 2018 with 2 articles each and 2019 with 4 articles.

It was possible to identify that most of these articles correlated the importance of Nursing Care in the identification and treatment of sepsis, however, not all of them specifically explored this care in the Intensive Care Unit.

Next, Chart 1 describes the works, highlighting the authors, titles, year of publication and the objectives of each of these studies.

Frame 1 Articles collected in the SCIELO and VHL databases on Nursing Care in the prevention and treatment of patients with sepsis in adult ICU between 2014 and 2019. Ilhéus-Ba, 2020.

AUTHORS	TITLE	GOALS
Barros LLS, et al. 2016	Risk factors associated with worsening sepsis in patients in the intensive care unit.	To evaluate the risk factors, clinical characteristics and main etiologic agents associated with the worsening of sepsis in ICU patients.
Rosa RS, et al. 2018	Nursing interventions in changes in cardiorespiratory clinical parameters in patients with sepsis.	To reflect on the evidence on cardiorespiratory clinical changes related to sepsis, as well as the main nursing interventions in clinical practice.
Oliveira SC, et al. 2019	The nurse in the detection of signs and symptoms that precede sepsis in patients in the ward	Describe the signs and symptoms that precede sepsis in patients admitted to the Medical Clinic of a Federal Hospital in Rio de Janeiro identified by the nurse; to analyze how nurses correlate signs and symptoms with Sepsis-1, Sepsis-2 and Sepsis-3.
Prates DB, et al. 2014	Impact of a multidisciplinary program to reduce the incidence densities of infection associated with care in the ICU of a tertiary hospital in Belo Horizonte.	To evaluate the effect of multidisciplinary team interventions in reducing the incidence of infections in the ICU of a tertiary hospital in Belo Horizonte.
Vieira AM, et al. 2019	Characteristics of deaths of patients admitted to an intensive care unit of a tertiary hospital.	To trace a relationship between predicted mortality and characteristics of patients admitted to the ICU of a large tertiary hospital in the city of Fortaleza/CE.
Miranda AP, et al. 2019	The nurse's knowledge regarding the sepsis protocol in an emergency service of a large public hospital.	To describe the knowledge of nurses regarding the early identification of sepsis in an emergency room of a large hospital in Recife.
Veras RES, et al. 2019	Evaluation of a clinical protocol by nurses in the treatment of sepsis.	To evaluate the use of a clinical protocol by nurses in the treatment of sepsis in a private hospital.
Garrido F, et al. 2017	Nurses' actions in the early identification of systemic	To verify the actions of the nurse for the early identification of systemic changes caused by severe sepsis related to hemodynamic,

	changes caused by severe sepsis.	neurological, respiratory, renal and nutritional changes of patients admitted to adult ICUs.
Neto JMR, et al. 2015	Conceptions of nurses working in a General Intensive Care Unit about sepsis.	To verify the understanding of nurses of a General Intensive Care Unit in relation to sepsis.
Silva TTSC, et al. 2017	Knowledge of nursing professionals about sepsis – study in a university hospital in Fortaleza/Ceará.	To evaluate the knowledge about sepsis by nursing professionals at the Walter Cantídio University Hospital, Federal University of Ceará.
Pedrosa KKA, et al. 2018	Validation of a care protocol for septic patients in the Intensive Care Unit	To develop and validate a protocol for nursing care to septic patients in the Intensive Care Unit.
Rocha LL, et al. 2015	Current concepts on hemodynamic support and septic shock therapy	Do a narrative review of the evidence available in hemodynamic support for patients with septic shock and provide an overview of the main interventions available for resuscitation.

Source: Prepared by the author himself.

The Regional Nursing Council of São Paulo (2016) describes that sepsis is a recurrent health condition in Intensive Care Units, and also the main cause of non-cardiac death in these environments, and therefore its early identification is indispensable. The infections most related to the development of sepsis are pneumonia, intra-abdominal infection and urinary tract infection, the latter being the one with the lowest lethality compared to the others mentioned (COREN, 2016). These statements corroborate the studies by Vieira et al. (2019), where 137 patients were studied, of which 31 died, and of these who died, 80.6% developed sepsis during ICU stay, with the presumed focus of highest incidence being the respiratory system with 54.8%, followed by the abdominal system with 25.8%.

The analyses of Prates et al. (2014) made in their study, observed that the most frequent infection in the ICU was pneumonia associated with mechanical ventilation. He exposes that, in order to prevent and consequently reduce the number of infections caused by the use of mechanical ventilation, measures have been adopted, among which are the elevation of the head of the bed by 45°, daily interruption of sedation and daily evaluation of extubation conditions.

The early identification of sepsis, coordinated with appropriate therapy, can lead to favorable results for the patient, since it is in the early stages that the chances of avoiding death increase. For this, it is necessary to institute protocols and training based on clinical practice for health professionals, especially for the nursing team, since they are the ones who provide direct care 24 hours a day, every day of the week (COREN, 2016).

Discerning Systemic Inflammatory Response Syndrome (SIRS) from sepsis is not easy because the presence of an infectious focus is not always evident, in addition, its signs and symptoms can be confused with other non-infectious processes or even go unnoticed (COREN-

SP, 2016). SIRS is determined in the presence of at least 2 clinical evidences such as hypothermia or hyperthermia, tachycardia, tachypnea or dyspnea, and leukocytosis or leukopenia. (COREN-SP, 2016). Sepsis is a SIRS secondary to a confirmed or suspected infectious process, regardless of which microorganism causes the infection; and in severe sepsis presents the same criteria as sepsis added to signs of hypoperfusion such as oliguria or lowering of the level of consciousness (SILVA et al., 2017). This differentiation between SIRS and sepsis facilitates the management directed to the needs of the patient and the early identification of the onset of sepsis.

Oliveira et al. (2019) conducted a study with 10 nurses to assess whether they have mastery in identifying the signs and symptoms that precede sepsis. The same evidenced that professionals have mastery over the concept of sepsis, as evidenced in the study by Miranda et al. (2019). However, both studies identified that these professionals have difficulty in differentiating sepsis from its associated or worsening conditions. In addition, Oliveira et al. (2019) identified that the parameters most used by them in the early identification of sepsis are vital signs, suggesting that these parameters, without the use of laboratory tests, are not enough for qualified and efficient care. In the study by Silva et al. (2017) the concept of sepsis according to the Latin American Sepsis Institute, was correct by only 40% of nursing professionals, demonstrating a lack of integral mastery of the theme, which hinders adequate recognition and decision-making, but according to him, this lack of mastery can be justified by the fact that the study was conducted with professionals from other sectors and not only the working in the ICU. Neto et al. (2015) reports that there were two statements among the nurses participating in the study in which they describe sepsis as a generalized infection and not an infection that causes systemic inflammatory response, revealing that it is necessary to institute permanent education in the institutions regarding the protocols for combating and treating sepsis.

One of the most renowned hospitals in Brazil has created and made available on the *internet* a protocol for the diagnosis and early treatment of sepsis in adults, to ensure agility in the recognition of sepsis. This document shows that sepsis can be diagnosed by at least two signs such as tachycardia, fever or hypothermia, tachypnea and signs identified in laboratory tests such as leukopenia, in addition to the differential test that is lactic acid, which confirms sepsis if altered (Hospital Sírio Libanês, 2018). The elevation of lactate levels is the result of anaerobic respiration performed by the tissues, since peripheral vasodilation and hypotension corroborate a picture of tissue hypoperfusion and hypoxia. This fact highlights the need to administer vasoactive drugs such as noradrenaline (Hospital Sírio Libanês, 2018).

Oliveira et al. (2019) identified in their research that nursing professionals correctly attributed the activation of the physician after the identification of sepsis in order to continue patient care. Miranda et al. (2019) said that the nurses participating in their research have technical/scientific knowledge to identify sepsis in the initial phase and that they know the phases of sepsis, as well as the appropriate management in the first 6 hours. However, Miranda et al (2019) cited in their article a Brazilian study conducted by another researcher with medical professionals on sepsis and he states that in this study the difficulty of physicians in recognizing sepsis and severe sepsis was identified. In the study by Garrido et al. (2017), the results found showed that nursing professionals have difficulty in verifying the systemic changes caused by severe sepsis in patients admitted to the adult ICU.

In addition to the clinical protocols to guide the appropriate conducts in the identification and treatment of sepsis by the multidisciplinary team, the use of the systematization of Nursing Care becomes essential to direct the care by the Nursing team to patients at risk or even with sepsis already installed (GUEDES et al., 2015).

One of the main actions in nursing care in the clinical management of patients with sepsis is the continuous monitoring of clinical signs, especially cardiorespiratory and thermal signs (ROSA, 2018).

In the study conducted by Rosa et al. (2018), NCS was used to identify the main nursing interventions and the respective actions for cardiorespiratory and thermal changes in sepsis. Among them are: Hemodynamic Regulation, with the actions of continuously monitoring vital signs, performing water balance and volume replacement, administration of vasoactive drugs, among others; the Respiratory State, with the actions of O2 administration, pay attention to the values of arterial blood gas and laboratory tests, elevation of the headboard and stimulate cough; Temperature regulation, with systematic monitoring in the prevention of hyper or hypothermia and medication administration. It is noteworthy that, of all the articles used in this study, Rosa et al. (2018) was the only one to not only mention NCS as an essential tool for Nursing, but integrated it into the construction of their text, evidencing the importance of NCS in the organization of care and in the identification of the real and potential needs of patients with sepsis.

The higher incidence of sepsis among ICU patients is also because this is an environment where many invasive procedures are performed, as the study by Barros et al. (2016) points out. Barros addresses in his study that all patients with septic shock were submitted to at least one invasive procedure such as bladder catheterization, mechanical ventilation, and vascular catheter.

It is important to highlight that the picture drawn above is preventable, through the implementation of Standard and Specific Precaution, simple hand hygiene measures and the use of aseptic technique, the latter being indispensable in intubation and aspiration of airways in patients using mechanical ventilation. These measures drastically reduce the rates of Healthcare-Related Infections (HAIs). However, simple measures such as these have been neglected by working professionals (ANVISA, 2017; BARROS et al., 2016)

Given the problem of high incidence and mortality due to Sepsis in patients in the Intensive Care Unit, it is necessary to institute early treatment as soon as it is identified. To this end, according to COREN-SP (2016), the Sepsis Survival Campaign was launched in 2004, which was revised in 2008 and 2012 and, parallel to this, *bundles* or packages were created, which are nothing more than a set of interventions based on scientific evidence. Currently there are packages of 3 and 6 hours, which prioritize some interventions in the initial treatment of sepsis, increasing the chances of success (COREN-SP, 2016).

Veras et al. (2019) report that the data found by them ratify with that of the literature, in which clinical protocols direct care and bring more efficacy and effectiveness in the treatment of patients with sepsis, impacting on the reduction of mortality. However, according to Veras et al. (2019), many challenges were observed in the use of these protocols, of which, the limitation of nursing care in initiating the conducts is the main one, since the prescription of medications and the dispensation of medication and agility in releasing the reports of laboratory tests are not attributable to Nursing, but directly impacts on the time of intervention of the team in the treatment of the patient.

This reflects that, despite the importance of the nursing team in the prevention, early recognition and treatment of sepsis, it is not possible to attribute to these professionals alone the high rate of mortality from sepsis in the ICUs, because in addition to not being the only health workers to perform invasive interventions, which can lead to the development of an infection and the risk of sepsis, The success of the interventions also depends on the agility and training of the other professionals involved, such as the doctor, pharmacist, biomedical, nutritionists and physiotherapists.

The work of Garrido et al. (2017), showed that the difficulties in using the protocols to assist patients with sepsis come from institutional reasons such as lack of specific forms and difficulties in the interpretation of the patient's clinical data by the nurse.

These data only confirm the need for training of the entire health team, especially the nursing team, through periodic training with current content on this subject, using consolidated devices such as Continuing and Permanent Education.

Next, in the context of *implantation of bundles* in sepsis, Chart 2 shows the presentation of the treatment at the ideal time of its implementation:

Frame 2 Budles of 3 and 6 hours for the management of patients with severe sepsis or septic shock (COREN-SP, 2016).

❖ **3 HOUR PACKAGE**
▪ Serum lactate collection for evaluation of perfusion status
▪ Blood culture collection before initiation of antibiotic therapy
▪ Initiation of broad-spectrum intravenous atibiotic
▪ Early volume replacement (in case of hypotension or lactate 2x above normal)
❖ **6-HOUR PACKAGE** (For patients with hyperlactosemia or persistent hypotension).
▪ Use of vasopressors to maintain MAP > 65mmHg
▪ Reassessment of volemic status (pulse, level of consciousness, measurement of CVP and SpO2)
▪ Reassessment of lactate levels in patients with initial hyperlactosemia

Of all the articles selected for the present study, 6 of them talked about bundles, these were: Oliveira et al. (2019), Rosa et al. (2018), Miranda et al. (2019), Neto et al. (2015), Garrido et al. 2017, Pedrosa et al. (2018). It is noticed that, of all the articles present in Chart 1, those that used this clinical protocol as an auxiliary tool in the treatment of sepsis have a maximum of three years that have been published.

Only the articles by Rocha et al. (2015) and Pedrosa et al. (2018) fully and thoroughly address the treatment for patients with sepsis by the health team. This wealth of details enhances the knowledge of health professionals who have access to these contents, thus providing their empowerment on the subject and assisting in the implementation of effective and quality treatment in cases of sepsis.

3 CONCLUSION

This review showed that the nursing team is a protagonist in the early identification and treatment of sepsis because these workers provide permanent care at the bedside, and this continuous contact helps in the identification of any change in the hemodynamic condition of the patient, corroborating for a quick action in the fight against sepsis by the health team and also in the control of this syndrome among ICU patients.

Despite the protocols created by consolidated institutions in the health care of patients affected by sepsis in the ICU, many professionals are still unable to apply them easily during the development of their work activities, either due to lack of knowledge, due to the need

for training in the institution, due to lack of implementation of these protocols in hospitals, or even due to limitations in the provision of care, because this is a multidisciplinary activity, which must be integrated, articulated and qualified to conduct and continue care in an efficient way so that it evidences the reduction of cases of sepsis, as well as the mortality caused by it.

It is possible to conclude that prevention combined with training and continuing education activities remain the best asset in the fight against mortality from sepsis and efforts to respect the actions of good health practices should be developed by all health professionals who have direct contact with patients hospitalized in the ICU, especially the simplest action that is hand hygiene.

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