REVISTA ONLINE DE PESQUISA

CUIDADO É FUNDAMENTAL

Universidade Federal do Estado do Rio de Janeiro • Escola de Enfermagem Alfredo Pinto

RESEARCH

DOI: 10.9789/2175-5361.2019.v11i5.1307-1311

The Nurse Approach Towards the Detection of Antecedent Signs and Symptoms of Sepsis in Patients at a Nursing Ward

O Enfermeiro na Detecção dos Sinais e Sintomas que Antecedem Sepse em Pacientes na Enfermaria

El Enfermero en la Detección de los Señales y Síntomas que Antecede a Sepse En Pacientes En La Enfermería

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How to quote this article:
Oliveira SC, Corrêa BT, Dodde HN, *et al*. The Nurse Approach Towards the Detection of Antecedent Signs and Symptoms of Sepsis in Patients at a Nursing Ward. Rev Fund Care Online.2019. Oct./Dec.; 11(5):1307-1311. DOI: http://dx.doi.org/10.9789/2175-5361.2019.v11i5.1307-1311

ABSTRACT

Objective: The study's goal has been to describe the antecedent signs and symptoms of sepsis in patients hospitalized in the Medical Clinic of a Federal Hospital in *Rio de Janeiro* city, which are identified by a Registered Nurse; to analyze how the Nurse correlates the signs and symptoms with Sepsis-1, Sepsis-2 and Sepsis-3. **Methods:** It is a descriptive study with a quantitative approach; the population were 10 Registered Nurses who worked daytime shifts in the nursing ward. Data collection was performed through a structured questionnaire, addressing the identification of signs and symptoms that precede sepsis, including the characteristics and peculiarities of sepsis. **Results:** The Nurses have adequate understanding regarding the concept of sepsis, although they have showed difficulties in correlating some of the signs and symptoms. **Conclusion:** The Nurses are aware that sepsis is a health problem and that they provide direct care to the patient, therefore, it is important to identify the signs and symptoms that precede it in order to offer quality assistance and to help reducing new cases.

Descriptors: Nursing, Sepsis, Signs and Symptoms, Systemic Inflammatory Response Syndrome.

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RESUMO

Objetivo: Descrever os sinais e sintomas que antecedem a sepse em pacientes internados na Clínica Médica de um Hospital Federal no Rio de Janeiro identificados pelo Enfermeiro; analisar como o Enfermeiro correlaciona os sinais e sintomas com a Sepsis-1, Sepsis-2 e Sepsis-3. Métodos: Estudo descritivo com abordagem quantitativa, a população foram 10 Enfermeiros em plantões diurnos na enfermaria da Clínica. A coleta de dados foi um questionário estruturado, abordando identificação dos sinais e sintomas que antecedem a sepse, englobando as características e particularidades da sepse. **Resultados:** Evidenciou-se que possuem entendimento sobre o conceito de sepse, entretanto apresentaram dificuldades em correlacionar alguns dos sinais e sintomas dos tipos de sepse. **Conclusão:** Ciente que a sepse é um problema de saúde e o Enfermeiro presta cuidado direto ao paciente, percebe-se a importância na identificação dos sinais e sintomas que a antecedem para oferecer assistência de qualidade e auxiliar na redução dos casos.

Descritores: Enfermagem, Sepse, Sinais e sintomas, Síndrome de resposta inflamatória sistêmica.

RESUMEN

Objetivo: Describe los síntomas y antecedentes de la sepsis en pacientes internados en la Clínica Médica de un Hospital Federal en Río de Janeiro por el enfermero; analizar cómo el enfermero correlaciona los signos y síntomas con Sepsis-1, Sepsis-2 y Sepsis-3. **Métodos:** Estudio descriptivo con abordaje cuantitativo, la población fue 10 enfermeros en turnos diurnos en la enfermería de la Clínica. La recolección de datos fue un cuestionario estructurado, abordando identificación de los signos y síntomas que anteceden a la sepsis, englobando las características y particularidades de la sepsis. **Resultados:** Tienen un entendimiento adecuado sobre el concepto de sepsis, sin embargo, presentan dificultades en correlacionar algunos de los signos y síntomas. **Conclusión:** Es consciente de que la sepsis es un problema de salud y el enfermero presta atención directa al paciente, se percibe la importancia en la identificación de los signos y síntomas que la anteceden para ofrecer asistencia de calidad y auxiliar en la reducción de los casos.

Descriptores: Enfermería, Sepsis, Signos y Síntomas, Síndrome de Respuesta Inflamatoria Sistémica.

INTRODUCTION

Sepsis derives from the Greek *septikós*, referred to by Hippocrates (460 to 377 B.C.) as rotting, which causes putrefaction.[1]

Historically, sepsis has had major impacts on mankind in the three major documented plague pandemics: Egypt and countries of Europe (542 to 602 A.D.), in Asia following throughout Europe and North Africa from the 14th to the 16th centuries, and in China expanding by the sea in 1894, decimating thousands of people.[2]

With the evolution of nineteenth-century science on living microorganisms responsible for infectious processes in the studies of Pasteur, Lister, and Semmelweis, sepsis was associated with a serious and devastating infection.[1]

The first definition of sepsis was formulated in 1991, considering this condition as a Systemic Inflammatory Response Syndrome (SIRS) associated with an infectious outbreak. In 2001, new definitions were proposed, without effectively modifying the knowledge and concept of sepsis, with the SIRS criteria remaining.[3]

In 2016, the Journal of the American Medical Association (JAMA) published proposals for new meanings and criteria for sepsis, titled as Sepsis-3, as well as the previous definitions of Sepsis-1 in 1991 and Sepsis-2 in 2001.[3,4]

According to the *Instituto Latino Americano de Sepse (ILAS)* [Latin-American Sepsis Institute], sepsis is recognized as a systemic response to an infectious disease, manifested in different clinical fields of the same pathophysiological segment, characterizing as a challenge the need for prompt recognition and treatment precoce.[5]

Considered a health problem, the most common circumstance of death in patients with sepsis is dysfunction of multiple organs, among which the most involved are the lungs, kidneys, heart, and liver.[6]

Expressing numerically, almost 1,000 people die per hour and, daily, around 24 thousand people die as a result of sepsis. Although it is responsible for an annual loss of more than 8 million lives, there is a difficulty in associating the signs and symptoms that precede sepsis. Sepsis mortality can be considerably reduced through the adoption of early recognition systems and standardized emergency treatment. Nevertheless, these interventions are currently provided in a timely manner to less than one in seven patients.[7]

In Brazil, around 600,000 new cases of sepsis are reported annually, which directly affects the morbidity and mortality parameters, accounting for 16.5% of the death certificates issued, approximately 250 thousand cases.[8]

It is important to point out that sepsis is present in patients admitted to any physical area of the hospital, where it is possible to evidence the signs and symptoms of sepsis, which makes it necessary to engage health professionals at all levels of care and interdisciplinary collaboration.

Given this framework, the role of the Nurse is paramount, since this is directly and daily present at the edge of the patient's bed. The Nurse is the professional that recognizes and evaluates the clinical manifestations early, accompanying the patient integrally in all their basic human needs and that suggests, together with the multiprofessional team, the pertinent and essential procedures to be taken in order to reduce the high indexes of morbidity and mortality of sepsis.[1]

Bearing in mind this contextualization, the following question was formulated: how does the Nurse who works in the ward of the Medical Clinic Unit of a Federal Hospital in Rio de Janeiro identify the signs and symptoms that precede a sepsis event?

In order to answer this question, the present objectives were elaborated: describing the antecedent signs and symptoms of sepsis in patients hospitalized in the Medical Clinic of a Federal Hospital in *Rio de Janeiro* city, which are identified by a Registered Nurse; analyzing how the Nurse correlates the signs and symptoms with Sepsis-1, Sepsis-2,

and Sepsis-3.

The study provides an approach on the signs and symptoms and types of sepsis for reflection of Nurses who care for hospitalized patients that have developed hospital infection. As a subsidy for discussion between teachers and students aiming at the orientation to observe the signs and symptoms in the care of patients with hospital infection and to research as a contribution to the construction of scientific knowledge on the matter.

METHODS

It is a descriptive study with a quantitative approach. The descriptive research mainly addresses the description of the characteristics of a population, phenomena or the establishment of relations between variables, using standard techniques of data collection, such as the questionnaire and systematic observation.[9]

The quantitative approach is characterized by the use of quantification in the information collection modality, in order to guarantee the accuracy of the results, to avoid distortions of analysis and interpretation, and to allow a certain margin of conclusions, being constantly applicable in descriptive studies, in the relation of the variables and in the relation of chance between phenomena.[10]

The study was carried out at a Federal Hospital located in *Rio de Janeiro* city, in the Medical Clinic with 30 beds, attending to several pathologies, except cases of proctology, orthopedics, urology, neurology, cardiology, and gastroenterology. Having two beds intended for patients in contact precaution.

The participants of this study were 10 Registered Nurses who worked daytime shifts in the nursing ward. Nurses who were either on vacation or medical leave were excluded.

Data collection was performed in December 2017 through a structured questionnaire containing the demographic data of the participants and nine objective questions regarding the identification of signs and symptoms that precede sepsis, encompassing the characteristics and particularities of Sepsis-1, Sepsis-2, and Sepsis-3. Previously, the questionnaire was appreciated by the Chief Nurse of the Medical Clinic and by the Nurse in the sector who analyzed the objectivity and correspondence with the proposed objectives.

The Nurses were approached in the Medical Clinic and elucidated about the purpose of the research. After agreeing to the participation, the Informed Consent Form (ICF) and the questionnaire were distributed.

The collected data were stored and analyzed through the programs Excel 2010 and Word 2010, being analyzed in the form of descriptive statistics.

The ethical precepts were respected while maintaining the confidentiality and anonymity of the research participants, ensuring the confidentiality of data and information that would enable the identification of the Participants in accordance with the requirements of the Resolution No. 466/2012, in addition to clarifying the potential risks and possible discomfort.[11]

As this research has involved human beings, the research project was approved by the Ethics Committee from the *Universidade Federal do Estado do Rio de Janeiro* under Legal Opinion No. 2.436.821, December 13th, 2017. The material collected will remain exclusively used by researchers for the unique purpose of providing elements to the research and publications resulting from it.

RESULTS AND DISCUSSION

After data collection and tabulation, the proposed objectives were analyzed. Data revealed that participating Nurses were 80% female, 80% married, and 50% were graduates more than 10 years ago, but only 30% have been in the industry for more than five years. It was also revealed that 80% have specialization in the nursing area.

The study evidenced that the participating Nurses have an understanding of the concept of sepsis but presented difficulties in correlating the signs and symptoms with Sepsis-1, Sepsis-2, and Sepsis-3.

Among the signs and symptoms that define SIRS (Sepsis-1), tachycardia was the most important parameter for participating Nurses, 60%, and although leukocytosis characterized as a clinical manifestation of an infectious process, only 10% signal of SIRS.

Although the SIRS is no longer used as a definition of sepsis, it plays an essential role in the screening of patients with infection and risk of progression to sepsis.[12]

By adding the scientific knowledge to the practical one allows quality assistance focused on the detection, planning, and implementation of actions that address the needs of the patient.

Concerning the Sepsis-2, 80% of participating Nurses reported on tachycardia and body temperature changes, 50% on tachypnea and oliguria and only 20% on leukopenia.

According to the answers obtained, it was observed that there is greater attention in the parameters of the vital signs. In order to provide qualified and efficient care, it is necessary that the possible difficulties belonging to the clinical analyzes of the laboratory tests for the other indicators, such as leukogram, are overcome.

The Nurse for working directly with the care of the patient has the possibility of differentiating the first clinical changes in the signs and symptoms that precede the sepsis.[13] The difficulty in detecting and correlating the clinical data of the patient with suspected sepsis by the Nurse may be

related or not to the lack or insufficient training and the involvement of the Institutions in the actions of the Nurse in sepsis.

Regarding the sepsis protocols and *ILAS*-recommended care packages, 100% of the participating Nurses referred to non-existence in the sector under study, however, the improvement of care recommended by the *ILAS* should be through the use of systematic procedures such as protocols and care package to assist the Nurse in the detection of signs and symptoms prior to sepsis to ensure adequate surveillance and a satisfactory prognosis.[1]

Therefore, the implementation of care protocols helps identify the signs and symptoms that precede sepsis and the care package is used to follow the patient with sepsis.

After identification of the patient with suspected sepsis, procedures aimed at patient stabilization are a priority and should be taken immediately within the first hours, the three-hour and six-hour care package was created to accelerate and improve the adequate follow-up of the patient. the case of sepsis (**Table 1**).[5]

Three-hour package
Serum lactate collection for the perfusion status assessment;
Collection of blood culture before starting antibiotic therapy;
The onset of antibiotics, broad spectrum, intravenously, in the first hours of treatment;
Early aggressive volume replacement in patients with hypotension or lactate above twice the reference value;
Six-hour package (for patients with persistent hypotension or hyperlactatemia)
Use of vasopressors to maintain mean blood pressure above 65 mmHg;
Volume and tissue perfusion reassessment;
Reassessment of lactate levels in patients with initial hyperlactatemia;

Source: Adapted from Dellinger et al.[14]

The action of the Nurse in relation to the septic patient will be guided by the clinical course of the condition, based on oxygen supply, hemodynamic control, administration of vasoactive drugs, always paying attention to the speed of infusion and early alteration of signs and symptoms.[15]

Among the behaviors that the Nurse must perform after identifying the signs and symptoms that precede the sepsis, 70% of the participating Nurses respond that the conduct must be notified to the physician and 90% notify the attendant in the absence of the physician in the sector.

The *ILAS* recommends, in the face of sepsis, that the activation of the medical team is the conduct that must be adopted to continue the care of the septic patient. The Nurse should be able to distinguish signs and symptoms in order to enable the medical professional to be activated.[8]

Questioning about signs and symptoms prior to quick SOFA (Sepsis-3), 70% of participating Nurses stated that the level of consciousness is a symptom and 60% emphasized tachypnea. However, none of the participating Nurses identified blood pressure measurement as a determinant parameter.

Inability to maintain blood pressure at adequate levels by the organism impairs hemodynamic control, making it impossible to maintain the metabolic needs of the body and vitality of the organs, thus, the Nurse is the main professional because they are directly monitoring of this parameter.

The *ILAS* has updated the concepts of sepsis according to Sepsis-3, which describes quick SOFA (qSOFA) is a bedside tool to quickly identify adult patients who are more likely to have unfavorable prognoses, acting only as a tool for screening criteria, as clinical criteria for definition of organic dysfunction of qSOFA are respiratory rate greater than or equal to 22 rpm, systolic blood pressure less than or equal to 100 mmHg, and changes in the state of consciousness.[16]

Nonetheless, it considers that the new criteria limit the identification of the presence of organic dysfunction in developing countries, thus maintaining recommendations based on the Sepsis-2 guidelines of the Sepsis Survival Campaign.[12]

CONCLUSIONS

The study describes the antecedent signs and symptoms of sepsis. It was found that the participating Nurses have an understanding of the sepsis concept. Nevertheless, they presented difficulties in correlating some of the signs and symptoms with Sepsis-1, Sepsis-2, and Sepsis-3, aiming to update the new concepts of sepsis (Sepsis-3) in 2016.

The study shows that in the Medical Clinic sector there are no clinical protocols and package of care related to sepsis. The *ILAS* advocates the implantation and use of these resources in order to standardize care for the patient with suspicion and diagnosis of sepsis and as a way of providing a better prognosis.

As a proposal, it is suggested the development of permanent education aimed at the training of Nurses to qualify them in the identification, care, and treatment of patients with sepsis in order to develop the systematization of nursing care.

Being aware that sepsis is a worldwide recognized health problem with high morbidity and mortality rates and that the Nurse provides direct care to the patient, the importance of this professional in the identification of the antecedent signs and symptoms of sepsis is then evident to provide quality and thus helping to reduce cases of sepsis.

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Received on: 05/11/2018
Required Reviews: 07/18/2018
Approved on: 08/21/2018
Published on: 10/05/2019

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The authors claim to have no conflict of interest.