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REVIEW ARTICLE

Nurses' performance to dialysis patients with water overload in Intensive Care Units: a literature review

Actuación de enfermeros ante pacientes en diálisis con sobrecarga hídrica en Unidades de Cuidados Intensivos: una revisión de la literatura

Atuação do enfermeiro ao paciente dialítico com sobrecarga hídrica em Unidades de Terapia Intensiva: uma revisão da literatura

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Abstract

The present study aims to characterize the scientific evidence available on health care for dialysis patients with water overload in intensive care units and discuss the role of nurses in relation to patients with water overload. The main prevalent conditions in the ICU identified by the studies are: sepsis or septic shock, cardiovascular and cerebrovascular diseases, lung diseases, victims of trauma, hematological and liver diseases, pathologies of the immune system and renal failure, whether acute or chronic. Nursing care for dialysis patients is a major challenge for nurses working in Intensive Care Units, given the need for continuous attention and early intervention regarding complications associated with the disease and treatment, with water overload being a large part of concern regarding the clinical management of these patients.

Descriptors: Renal Dialysis; Intensive Care Units; Critical Care; Water-Electrolyte Balance; Nursing.

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Resumén

El presente estudio tiene como objetivo caracterizar las evidencias científicas disponibles sobre la atención a la salud de los pacientes en diálisis con sobrecarga hídrica en unidades de cuidados intensivos y discutir el papel de los enfermeros en relación con los pacientes con sobrecarga hídrica. Las principales condiciones prevalentes en la UTI identificadas por los estudios son: sepsis o shock séptico, enfermedades cardiovasculares y cerebrovasculares, enfermedades pulmonares, víctimas de trauma, enfermedades hematológicas y hepáticas, patologías del sistema inmunológico e insuficiencia renal, ya sea aguda o crónica. El cuidado de enfermería a los pacientes en diálisis es un gran desafío para los enfermeros que actúan en las Unidades de Cuidados Intensivos, dada la necesidad de atención continua e intervención temprana de las complicaciones asociadas a la enfermedad y al tratamiento, siendo la sobrecarga hídrica una gran preocupación en el manejo clínico de la estos pacientes.

Descriptores: Diálisis Renal; Unidades de Cuidados Intensivos; Cuidados Críticos; Equilibrio Hidroelectrolítico; Enfermería.

Resumo

O presente estudo tem como objetivo caracterizar as evidências científicas disponíveis sobre a assistência de saúde frente ao paciente dialítico com sobrecarga hídrica em unidades de terapia intensiva e discutir a atuação do enfermeiro diante do paciente em sobrecarga hídrica. As principais afecções prevalentes na UTIS apontadas pelos estudos são: sepse ou choque séptico, doenças cardiovasculares, cerebrovasculares, doenças pulmonares, vítimas de traumatismo, doenças hematológicas e hepáticas, patologias do sistema imunológico e insuficiência renal, seja ela aguda ou crônica. A assistência de enfermagem ao paciente dialítico é um grande desafio para os enfermeiros que atuam em Unidades de Terapia Intensiva, visto a necessidade de atenção contínua e intervenção precoce quanto às complicações associada à doença e ao tratamento, tendo a sobrecarga hídrica uma grande parcela de preocupação no que tange a manejo clínico desses pacientes.

Descritores: Diálise Renal; Unidades de Terapia Intensiva; Cuidados Críticos; Equilíbrio Hidroeletrolítico; Enfermagem.

Introduction

The Intensive Care Unit (ICU) is the place where patients in need of compensation for some organic or physiological system are admitted, where they are offered care, surveillance, continuous and permanent monitoring, where medical and nursing care is provided, specific and advanced way, and that there is an offer of intensive care, using state-of-the-art equipment and technology. These patients are submitted to invasive procedures, as well as pharmacological treatments to maintain life[1-3].

The main prevalent conditions in the ICU identified by the studies are: sepsis or septic shock, cardiovascular and cerebrovascular diseases, lung diseases, victims of trauma, hematological and liver diseases, pathologies of the immune system and renal failure, whether acute or chronic[4-6]. Kidney disorders are common causes of ICU admission as well as a consequence of it. These disorders can be classified into acute kidney disease (ARD) or chronic kidney disease (CKD)[7]. AKI is classified as a sudden, however, reversible loss of renal function, where there is an increase in the level of urea and creatinine in the blood, major metabolic disorders, acid base and hydroelectrolytic, as well as changes in phosphate, calcium, hormones and D vitamin[8,9]. CKD is characterized by the slow, progressive and irreversible loss of kidney function, so the kidneys lose their ability to filter blood over time and this process is definitive. The main causes of chronic kidney disease are glomerulopathies, prolonged and severe arterial hypertension, diabetes mellitus, hereditary kidney disease, polycystic disease. Diagnosis of these conditions involves the presence of proteinuria, hematuria, changes in albumin levels, visualization of changes in imaging tests, and decreased glomerular filtration rate (GFR)[10].

Both ARD and CKD may have as a therapeutic measure the change of diet, use of medications and renal replacement therapy (RRT) and kidney transplantation. RRT is performed in patients with severe acute kidney disease or in patients with stage 4 and 5 chronic kidney disease, with hemodialysis being the most commonly performed therapy. In dialysis, there are complications and disorders that can affect the patient, such as anemia, due to the sudden withdrawal of blood to the capillary (dialyser), vomiting due to fluid displacement, dyspnea due to the accumulation of fluid during treatment, cramps, tachycardia and hypotension[1,8,11].

One of the most recurrent complications and which most worries ICU health professionals is volume overload, with fluid infusion as one of the generating factors, one of the most common procedures in intensive care units, whether for feeding, medication, administration of blood products, fluid replacement, contrast for performing tests, volume stabilization, among others. This overload strongly contributes to the emergence of several complications such as “arterial hypertension, left ventricular hypertrophy, congestive heart failure and the high rates of cardiovascular mortality observed in this population”. The Brazilian Society of Nephrology points out that even if the volume overload is moderate, with an excess of only 15% in the volume of extracellular fluid, this is already enough to increase the

patient's mortality risk by two times, therefore, the volume overload is linked to poor prognosis of renal pathology[8,12-15].

Therefore, the nursing team stands out when it comes to the management of the dialysis patient, since it has the function of managing, controlling and supervising the patient's water status, becoming a key part for the early detection of complications and organic dysfunctions with the team. multidisciplinary, which requires updating on the prevailing conditions within the unit.

In this context, the following guiding question emerged: What are the nursing care findings in relation to dialysis patients with water overload?

The present study aims to characterize the scientific evidence available on health care for dialysis patients with water overload in intensive care units and discuss the role of nurses in relation to patients with water overload.

Methodology

This study will consist of a narrative review of the literature that is composed of a broad study, more suitable to describe and discuss the context of a fact or question raised; it is a study with variable methodologies and of a qualitative nature. It should be noted that this type of review is subject to the authors' subjectivity, as they guide and organize information without a specific methodological model[16,17].

In the current scenario, updating in health is of great relevance, as it drives and guides clinical practice professionals in the conduct of health, based on the context of Evidence-Based Health.

It is also defined the emphasis on Evidence-Based Practice (EBP) as a methodological objective, this concept is defined as "the transfer of research results to clinical practice [...]. In particular, the critical use of these results, the appropriation of this information for the practical world"[18].

In this way, for nursing in Intensive Care Units, evidence-based practice can bring to nursing care the promotion of an improvement in the quality of the service performed by the nursing team, as well as the possibility of increasing the confidence and scientificity of the interventions performed on patients, bringing beneficial results to the patient and a reduction in hospital costs.

The search for scientific articles was carried out through the online platforms of the VHL (Virtual Health Library) databases, for the MEDLINE and LILCS databases. This database is organized by the "Pan American Health Organization / World Health Organization through the Latin American and Caribbean Center on Health Sciences Information (BIREME/PAHO/WHO)"[19]. The VHL is mainly composed of 14 main, free and reliable databases for researching articles[19]. These successively integrate thousands of health journals and have a large number of scientific articles in their databases. In this research, the databases MEDLINE - Medical Literature Analysis and Retrievel System Online will be used, it is an online database that offers free access to references and abstracts of scientific journals in the Biomedical area. Approximately 5,400 journals from the United States and over 80 countries are indexed in this database[20]. The database LILACS - Latin American and Caribbean Literature on Health Sciences, which was created in 1985, has as its objective the bibliographic control and dissemination of Latin American and Caribbean scientific-technical literature in the area of Health, absent from international databases[21].

The SciELO database - Scientific Electronic Library Online, was also used, which is a supportive database for the medical field, as it is an electronic database that is composed of a collection of Brazilian and international scientific journals[22].

The study carried out included a literature review of scientific articles duly published in journals in the time span from 2010 to 2020, and the search in the databases was carried out in April 2020, looking for articles that present the factors associated with water overload in dialysis patients admitted to intensive care units.

The Health Science Descriptors were created by BIREME to be used in the indexing of articles from scientific journals, books, conference proceedings, technical reports, and other types of materials, as well as to be used in the research and retrieval of subjects from the scientific literature in LILACS, MEDLINE and other databases[23].

It is known that descriptors are standardized keywords, along with their synonyms and translated into other languages (English and Spanish), controlled descriptors are those that integrate the VHL database and uncontrolled descriptors are those that have not yet make up the database and scientific journals are not yet effectively integrated[20].

The descriptors selected for this research were duly selected and verified in the databases corresponding to the research, and are described in Chart 1.

Chart 1. Descriptors according to the database. Cabo Frio, RJ, Brazil, 2020

DATA BASE	NOT CONTROLLED	CONTROLLED
LILACS	Hemodialysis	Kidney dialysis
	Intensive Care Unit	Intensive Care Units
MEDLINE	Water overload	Critical care
	Nursing performance	Hydroelectrolytic balance
SciELO		Hydroelectrolyte imbalance
		Nursing care

The inclusion criteria for scientific articles were defined as having been duly published in a scientific journal, being available in full and free of charge, having been published between 2010 and 2020, articles from the LILACS, MEDLINE and SciELO databases and be in accordance with the theme established as the object of study of the work.

As exclusion criteria, articles published in languages other than Portuguese, articles related to pediatric or neonatal intensive care units; articles that appear repeatedly in more than one selected database.

After performing the search using the descriptors, an initial total of 8,874 articles was obtained and after applying the inclusion and exclusion criteria, 141 articles were found in LILACS, 47 articles in MEDLINE and 68 articles in SciELO. Subsequently, the titles of the articles found were read and a new selection was made, resulting in 31 articles in LILACS, 13 articles in MEDLINE and 8 articles in SciELO. As a last step in the selection of articles, the researchers performed a full reading of the abstracts of the articles, resulting in a total of 21 articles, distributed among 12 in LILACS, 8 in MEDLINE and 1 in SciELO, however, by eliminating the duplicate articles in the databases the final total of articles selected for the review was 7 articles.

Results and Discussion

A total of 256 articles were identified, after a careful reading of the titles, 52 were found according to the inclusion and exclusion criteria, these, in turn, had the abstracts read in full and underwent a floating reading of the entire body of the study in order to identify which addressed the researched topic, being selected 7 articles, as indicated in Chart 2.

When analyzing the behavior of the most frequently found databases, it can be seen that in the LILACS database 31 articles, of these 19 were excluded after a complete reading of the abstracts and they did not meet the theme, 10 because they were repeated in the databases, thus totaling 2 selected articles. In MEDLINE, 13 articles were found, of which 5 were excluded after a complete reading of the abstracts and they did not meet the theme. Remaining 8 articles that were divided into 4 because they were repeated in the databases and were excluded due to the criterion of repetition, thus totaling 4 selected articles. In SciELO, 8 articles were found, of these 7 were excluded after the complete reading of the abstracts, leaving 1 article. At the end, 07 articles were selected for review.

Chart 2. Quantitative sample by database. Cabo Frio, RJ, Brazil, 2020

Data base	Found	Selected	%
LILACS	31	2	29
MEDLINE	13	4	57
SciELO	8	1	14
TOTAL	52	7	100

In analyzing the distributions in the databases, a predominance of MEDLINE (57%) was identified, compared to LILACS (29%) and SciELO (14%), described in Chart 2. This factor may be associated with MEDLINE being an international database, present in more than 80 countries and with more than 5,400 indexed journals, while LILACS brought together only journals from Latin America and SciELO, for having specific databases in each country, and Brazil was selected, due to language barrier[24].

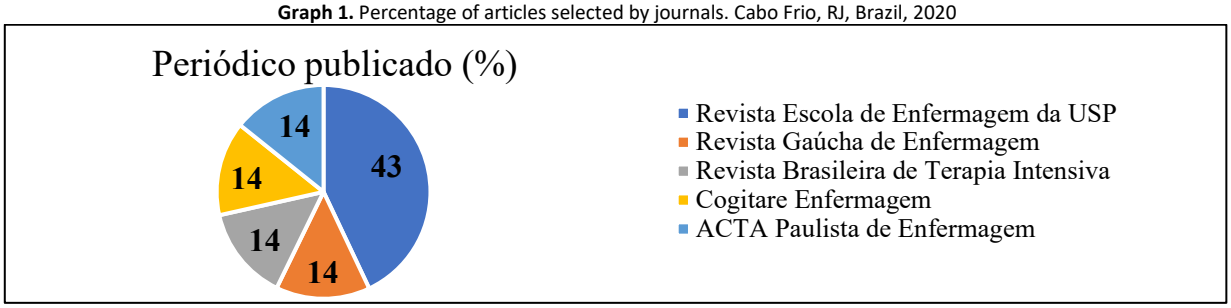
Chart 3. Synthesis of the studies selected for the literature review. Cabo Frio, RJ, Brazil, 2020

Nº	Título	Revista	Ano	Principais achados
1	Diagnósticos, resultados e intervenções de enfermagem em pacientes com lesão renal aguda	Acta Paulista de Enfermagem	2017	Risco de infecção, risco de perfusão gastrointestinal ineficaz, risco de perfusão renal ineficaz, risco de desequilíbrio eletrolítico, volume de líquidos excessivos e risco de volume de líquidos desequilibrados.
2	Atuação do enfermeiro intensivista no modelo colaborativo de hemodiálise contínua: nexos com a segurança do paciente	Revista Escola de Enfermagem da USP	2019	Atividades apontadas do enfermeiro intensivista na hemodiálise se tratava da: realização de atividades de preparação/planejamento e monitoramento/acompanhamento. Apontando peça-chave à percussões na segurança do paciente.
3	Validação de intervenções e atividades de enfermagem para pacientes em terapia hemodialítica	Revista Gaúcha de Enfermagem	2017	O Controle Hídrico foi validado como intervenção prioritária (média ≥ 0.8), com oito atividades principais para o diagnóstico Volume de Líquidos Excessivo e oito para o diagnóstico Risco de Volume de Líquidos Desequilibrado.
4	Lesão renal aguda em unidade de tratamento intensivo: características clínicas e desfechos	Cogitare Enfermagem	2016	Apontou uma relação entre a LRE com desenvolvimento de choque séptico com desfecho mais relevantes o óbito
5	Prevalência do diagnóstico de enfermagem Volume de líquidos excessivo em pacientes submetidos à hemodiálise	Revista Escola de Enfermagem da USP	2014	As características que apresentaram associação estatística foram: agitação, congestão pulmonar, distensão de jugular, edema, eletrólitos alterados, ganho de peso, ingestão maior que o débito e ruídos adventícios.
6	Análise do conceito sobrecarga de líquidos em pacientes com doença renal crônica em terapia dialítica: revisão integrativa	Revista Escola de Enfermagem da USP	2017	Foi identificado que 21 antecedentes e 22 consequentes de sobrecarga hídrica em pacientes com doença renal em terapia dialítica foram identificados.
7	Início precoce em comparação ao início tardio da terapia de substituição renal para lesão renal aguda: revisão sistemática atualizada, metanálise, metarregressão e análise sequencial de ensaios clínicos randomizados e controlados	Revista Brasileira de Terapia Intensiva	2018	Houve um maior o risco de infecção da corrente sanguínea relacionada ao cateter quando a terapia de substituição renal foi iniciada precocemente

The selected articles were submitted to a careful analysis of all their content, with a synthesis of the studies containing the title, journal, year and findings referring to the performance of the dialysis patient with water overload (Chart 3).

When we analyzed the various published journals, there was a greater number of publications in the Revista Escola de Enfermagem da USP (43%), while the Revista Gaúcha de Enfermagem, Revista Brasileira de Terapia Intensiva, Cogitare Enfermagem and ACTA Paulista de Enfermagem maintained the same pattern (14%), as shown in Graph 1.

Graph 1. Percentage of articles selected by journals. Cabo Frio, RJ, Brazil, 2020



This result may have been predominant, considering that the Revista Escola de Enfermagem da USP is a journal of great impact in the health area, with great demand from researchers for reliable and well-targeted data[25].

The annual distributions of the selected studies point to a higher production in 2017 (42.8%), followed by 14.2% in 2014, 14.2% in 2016, 14.2% in 2018 and 14.2% in 2018 2019

This fact may have a strong association with research priorities and the needs of the population, and kidney injury has been a great challenge in terms of control and health-related expenses, since the Ministry of Health (MS) has allocated a large part of the budget in the area of nephrology and which grew in 2010 and 2018. In Brazil, the MS invested almost 2 billion reais in care for patients with nephrological disorders, with a jump to almost 3 billion in 2018, this is equivalent to approximately 45% increase from these 8 years[27]. This indicates a gap regarding the theme in the last 03 years.

After a thorough analysis of the results provided in the articles, 14 findings related to the performance of the dialysis patient in water overload can be identified, these findings were grouped by similarity and categorized by variables, namely: water control (57.1%), evaluation symptomatology (57.1%), infection control (42.8%), severity analysis (28.5%) and maintenance of patient safety (14.2%), described in Table 1.

Table 1. Distribution of variables found in the synthesis of selected articles. Cabo Frio, RJ, Brazil, 2020

VARIABLE	N	%
Water control	4	57,1
Assessment of clinical signs and symptoms	4	57,1
Infection control	3	42,8
Severity analysis	2	28,5
Maintenance of patient safety	1	14,2
TOTAL	**14**	**100%**

Fluid control is of paramount importance for intensive care nurses, as it aims to generate information to monitor fluid balance and possible complications related to patients' excess fluid. In this scenario, the prescription, management and supervision of body fluid records must have special attention on the part of the ICU nurse, with the aim of generating data to assess the therapeutic response or clinical worsening of the patient[28].

In the context of homeostasis, the body triggers several mechanisms for organic control, and these are identified through the analysis of the signs and symptoms presented by the patient, therefore, it is of great importance that the nurse can be alert to the symptoms presented by the patient that may indicate evolution and involution in the clinical picture of the dialysis patient.

The evaluation of the signs and symptoms of the patient at risk of excessive fluid volume is essential to initiate early therapeutic measures, with the objective of treating the excessive volume of fluids, since this is a poor prognosis for the patient with renal failure on therapy. intensive care, as a serious, life-threatening condition[29].

Another factor worth mentioning in the evaluation is infection control, as infections are important causes of kidney changes or excessive fluid volume. This is primarily due to the infection triggering an inflammatory process, this process is closely related to increased atherogenesis by oxidative stress, decreased antioxidant activity and endothelial dysfunction, which will culminate in the major cause of mortality in patients with chronic kidney disease[29]. Along with this, there is an increase in the permeability of blood vessels, generating an extravasation of plasma and an increase in interstitial fluid, which will be responsible for the formation of edema, leading to an increase in the volume of body fluids[31,32].

It is therefore necessary that the inflammation and the progression of the excessive volume of liquids can be adequately monitored by the nurse, mainly through the recording and analysis of the rigorous water balance and evaluation of the clinical signs, since the evolution of the patient is fundamental to alert the patients, risks of patient morbidity and mortality and, in this way, establish its severity and real chances of improvement.

In all cases, regardless of the pathology or the care effectively implemented, performing an analysis of the severity and the possible complications that may result from the excess of liquids are fundamental for the planning of nursing care. Mainly because it is a potentially serious condition and is prevalent in about 82% of patients with kidney disease[33].

This is due to the risk of mortality associated with water overload, which in the case of renal patients is a very prevalent condition of the water overload panel[33].

The main complications resulting from excess fluid volume that we can mention are acute pulmonary edema, circulatory overload with consequent decrease in heart efficiency, generating congestive heart failure and arterial hypertension[34].

Along with this, we can also mention the increased risk for the safety of this patient, since its maintenance is of vital importance, because patients who develop water overload find their chances of developing pressure injuries increased, an associated condition to the patient safety[36,37].

It is noteworthy that the nurse's role with the patient with water overload is directly related to continuous attention and directed to the findings mentioned here and, taking into account the therapeutic decisions are evaluated from the professionals' records, it is worth emphasizing the need and urgency of standardization the awareness of professionals regarding the records. The correct performance of the water balance and its adoption as a routine for patients is essential so that these patients can have an individualized care plan, aiming to reduce their complications.

Conclusion

Nursing care for dialysis patients is a major challenge for nurses working in Intensive Care Units, given the need for continuous attention and early intervention regarding complications associated with the disease and treatment, with water overload being a large part of concern regarding the clinical management of these patients. What points out to a need to establish an action based on the scientific evidence available to maintain a safe practice.

In this review, we can identify a predominance of publication in the MEDLINE database, in the Revista Escola de Enfermagem da USP, in 2017. Pointing out a relevance of the topic addressed, however, a publication gap in recent years. The variables raised about nursing care for patients with water overload are related to water control, evaluation of signs and symptoms, infection control, analysis of severity and maintenance of patient safety. These findings can serve as subsidies to assist the clinical practice of nurses in the face of critically ill patients, and guide indirect health actions that promote safety and quality.

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