Hemodialysis complications in the intensive...



ORIGINAL ARTICLE

HEMODIALYSIS COMPLICATIONS IN THE INTENSIVE CARE UNIT COMPLICAÇÕES HEMODIALÍTICAS NA UNIDADE DE TERAPIA INTENSIVA COMPLICACIONES HEMODIALÍTICAS EN LA UNIDAD DE TERAPIA INTENSIVA

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ABSTRACT

Objective: to characterize the sociodemographic profile and to identify complications in patients submitted to hemodialysis treatment admitted to the Intensive Care Unit. Method: this is a quantitative, cross-sectional and descriptive study carried out in the Intensive Care Unit. The sample consisted of 78 medical records of patients who underwent hemodialysis in the year 2016. A form for sociodemographic and clinical characterization was used to collect data. A descriptive statistical analysis was performed, and presented in tables. Results: the predominance of men aged 60 years or older and with an initial diagnosis of chronic kidney disease was identified. It was pointed out that in 255 hemodialysis sessions, the main complications were: hypotension - 94 (36.86%), arterial hypertension - 47 (19.10%), cardiac arrhythmias - 34 (13.82%) and clots in the filter or system - 34 (13.82%). Conclusion: it was evidenced the need for educational measures in order to qualify the decision making of the nursing team and, consequently, to reduce intradialitic complications. Descriptors: Critical Care; Nursing care; Kidney Dialysis; Intensive Care Units; Health Profile.

Objetivo: caracterizar o perfil sociodemográfico e identificar complicações em pacientes submetidos ao tratamento hemodialítico internados em Unidade de Terapia Intensiva. Método: trata-se de um estudo quantitativo, transversal e descritivo, realizado em Unidade de Terapia Intensiva. Constituiu-se a amostra por 78 prontuários de pacientes que realizaram hemodiálise no ano de 2016. Utilizou-se, para a coleta de dados, um formulário para a caracterização sociodemográfica e clínica. Realizou-se uma análise estatística descritiva, e apresentados em tabelas. Resultados: identificou-se o predomínio de homens, com idade igual ou superior a 60 anos e com diagnóstico inicial de doença renal crônica. Apontou-se que, em 255 sessões de hemodiálise realizadas, as principais complicações foram: hipotensão arterial - 94 (36,86%), hipertensão arterial - 47(19,10%), arritimias cardíacas - 34(13,82%) e coágulos no filtro ou sistema - 34 (13,82%). Conclusão: evidenciou-se a necessidade de medidas educativas no intuito de qualificar a tomada de decisão da equipe de Enfermagem e, consequentemente, reduzir as complicações intradialíticas. Descritores: Cuidados Críticos; Cuidados de Enfermagem; Diálise Renal; Unidades de Terapia Intensiva; Perfil de Saúde.

RESUMEN

Objetivo: caracterizar el perfil sociodemográfico e identificar complicaciones en pacientes sometidos al tratamiento hemodialitico internados en Unidad de Terapia Intensiva. Método: se trata de un estudio cuantitativo, transversal y descriptivo, realizado en Unidad de Terapia Intensiva. Se constituyó la muestra por 78 prontuarios de pacientes que realizaron hemodiálisis en el año 2016. Se utilizó para la recolección de datos un formulario para la caracterización sociodemográfica y clínica. Se realizó un análisis estadístico descriptivo, y se presentaron en tablas. Resultados: se identificó el predominio de hombres, con edad igual o superior a 60 años y con diagnóstico inicial de enfermedad renal crónica. En la mayoría de los casos, se observó que, en 255 sesiones de hemodiálisis realizadas, las principales complicaciones fueron: hipotensión arterial - 94 (36,86%), hipertensión arterial - 47 (19,10%), arritmias cardíacas - 34 (13,82%) y coágulos en el filtro o sistema 34 (13,82%). Conclusión: se evidenció la necesidad de medidas educativas con el fin de calificar la toma de decisión del equipo de Enfermería y, consecuentemente, reducir las complicaciones intradialiticas. *Descritores*: Cuidados Críticos; Atención de Enfermería; Diálisis Renal; Unidades de Cuidados Intensivos;

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INTRODUCTION

It is known that in the Intensive Care Unit (ICU) patients are hospitalized with varied diagnoses, usually in critical condition, vulnerable, suffering, with organic dysfunctions, requiring specific care according to hemodynamic changes and an intervention the multidisciplinary team.¹⁻²

Among the organic alterations in patients admitted to the ICU, it is possible to show that kidney function impairment, usually associated with a broad spectrum of etiologies, occurs in different clinical situations³ and that when combined with age and comorbidities, make the kidneys more susceptible to grievances.⁴

Acute Kidney Injury (AKI), also known as Acute Kidney Failure (AKF) characterized by the acute decline of kidney function, decreased glomerular filtration rate (GFR) and/or urinary volume, due to disturbances in the control hydroelectrolytic and acid-base balance.⁴ In patients admitted to the ICU, AKI is associated with alterations in serum urea and creatinine levels, pressure, hydration and urinary appearance.⁵

Chronic Kidney Disease (CKD) is understood to be asymptomatic, only manifesting its signs and symptoms more clearly between the phase of moderate and severe kidney failure, when the kidneys already have a significant loss of function caused, mainly due to Diabetes Mellitus and arterial hypertension, and is associated with modifiable risk factors, besides advancing age. ⁶⁻⁷

Hemodialysis is used as a modality of kidney replacement therapy in the ICU, the mechanical process of which aims to remove toxic substances and excess fluid that accumulate due to kidney failure.8 Hemodialysis is understood to contribute to the maintenance of life of the patient; however, can trigger several complications that may, in some extremely serious situations, lead the patient to death during the hemodialysis procedure.9

Among the main intradialytic complications, hypotension, hypertension, muscle cramps, nausea, fever and chills are among the main intradialitic complications. Continuous monitoring, detection and intervention in relation to such complications are a differential in obtaining safety and quality of the hemodialysis treatment. 9

Emphasis is given to the importance of the nursing team, as professionals who actively participate in hemodialysis treatment, regarding the responsibility for direct care to

the patient¹⁰ and, in this sense, to the appropriate interventions, according to the specific needs of hemodialysis patients, as well such as the permanent education of the team, which contributes to the reduction of hemodialysis complications in the ICU.⁹ It is important to note that the need for the Nursing team to know the possible complications during hemodialysis treatment.⁹

It is important to carry out this study by the significant number of patients undergoing hemodialysis treatment in the ICU and, therefore, it is understood that it is necessary to know the main complications arising from the dialysis procedure and how the Nursing team can act in these situations.

OBJECTIVE

• To characterize the sociodemographic profile and identify complications in patients submitted to hemodialysis treatment admitted to the Intensive Care Unit.

METHOD

This is a quantitative, cross-sectional and descriptive study carried out in a General Intensive Care Unit of a philanthropic located medium-sized hospital, in a municipality, in the southern region of the State of Mato Grosso. The sample consisted of 78 medical records of patients who underwent kidney replacement therapy in hemodialysis in 2016 and presented complications during hemodialysis sessions. The following inclusion criteria were used: adult patients, aged 18 years or older, with a medical diagnosis of acute kidney injury or chronic kidney disease, who presented complications during the hemodialysis sessions recorded by the nursing team. Were excluded from this study, the charts of patients who did not undergo hemodialysis in the year 2016.

As a data collection instrument, a script with the following information was used: age, gender, occupation, hospitalization agreement, initial diagnosis of hospitalization, place of origin, venous access of hemodialysis and intradialytic complications that were tabulated. A spreadsheet was subsequently elaborated and the descriptive analysis was done. The data were collected between September and December 2016.

It was strictly adhered to the ethical precepts regulated by Resolution 466/2012 and, to this end, the study was approved on September 9, 2016 by the Ethics and Research Committee of the Federal University of Mato Grosso under Opinion No. 1,719,453 and CAAE n° 59428216.0.0000.5587.

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RESULTS

The results of the research are presented in tables 1 to 3.

Table 1. Sociodemographic profile of patients submitted to hemodialysis in the general ICU. City (UF), Brazil, 2016.

Variables	n	%
Gender		
Male	51	65.38
Female	27	34.61
Age (years)		
20-59	37	47.43
60 or more	41	52.56
Occupation		
Retired	29	37.17
Housewife	15	19.23
Others	28	35.89
Total	78	100

Source: Medical records of patients admitted to the ICU (2016).

Table 2. Characteristics of the clinical conditions and hospitalization of patients in the ICU. City (UF), 2016.

Variables	n	<u></u> %
Hospitalization plan		
Unified Health System	50	64.10
Other health plans	28	35.89
Inicial Diagnosis		
Chronic Kidney Disease	22	28.22
Infections	41	52.56
Neoplasias	13	16.66
Politraumas	04	5.12
Acute Kidney Injury	03	3.84
Others	19	24.35
Place of origin of hospitalization		
Other hospitals	39	50.00
Hospitalization unit	21	26.92
Public and private emergency services	18	23.07
Vascular access for hemodialysis		
Temporary double lumen catheter	69	88.46
Arteriovenous fistula	05	6.41
Total	78	100

Source: Medical records of patients admitted to the ICU (2016).

Table 3. Main intradialytic complications of patients undergoing hemodialysis in the general ICU. City (UF), Brazil, 2016.

Variables	N= 255	%
Arterial hypotension	94	38.21
Arterial hypertension	47	19.10
Cardiac arrhythmias	34	13.82
Coagulation of the filter or system	34	13.82
Lack of vascular access flow	20	8.13
Psychomotor agitation	11	4.47
Sweating	07	2.84
Cramps	03	1.21
Dyspnea	02	0.81
Hypoglycemia	01	0.40
Bleeding at access	01	0.40
System contamination	01	0.39
There were no complications	09	3.52
Total	78	100

Source: Medical records of patients admitted to the ICU, 2016.

DISCUSSION

It was evidenced, from the results of the analysis of 78 medical records of patients admitted to the ICU in 2016, who underwent hemodialysis treatment and had complications associated with the procedure, 51 (65.38%) were men and 41 were of 60 years or more, representing 52.56%. It is pointed out that this data is similar to those obtained in other studies, such as the Brazilian Society of Nephrology (BSN) survey in 2016, in which 58% of the patients were male. It is important to note that, in another study carried out at the Intensive Care Center (ICU) of the Hospital das Clínicas in Porto Alegre (RS), male patients submitted to hemodialysis therapy.

It is known that males are generally more vulnerable to chronic diseases, among them, hypertension and diabetes mellitus, the main risk factors for triggering kidney failure. One of the possible causes is the fact that men are less likely to attend health services¹² and that, when they do, they may be debilitated⁹ and, in some cases, at an advanced stage of kidney injury.

It was verified that the predominant age group was the one of users with age equal or superior to 60 years. There is an increasing elderly people number of in therapy, as well replacement as prevalence of some conditions associated with chronic kidney disease, such as protein-energy inflammation, anemia, acidosis or hormonal disorders.¹³ It is important to note, considering that senescence and physiological aging trigger age-related physiological changes4, that increasing age is a risk factor for triggering changes in kidney function.¹⁴

In the analysis of the occupational occupation of the patients, 29 (37.17%) were retired. Similar data were revealed in a study performed at the dialysis unit of the Santa Casa de Misericórdia Hospital of Itabuna in 2015.¹⁵ It is confirmed by the significant number of patients with advanced age and retired in hemodialysis treatment in the ICU, the aging population and the increase in life expectancy.^{6,16} It is pointed out, therefore, that these people are living with illness situations that demand continuous, intensive care and, in certain situations, with the limitations of an adequate monitoring of the health services.

Comorbidities are related to the development of comorbidities during ICU stay, and kidney dialysis is necessary, which may make the level of severity of the patient more critical. 10 The main diagnosis hospitalization of patients undergoing Hemodialysis complications in the intensive...

hemodialysis was identified in this study: chronic kidney disease (CKD), infections, neoplasias and polytrauma.

The results of this study show that the main diagnosis of hospitalization was CKD, with 22 cases (28.20%), corroborating another study, which emphasizes the importance of knowledge about the signs and symptoms of complications, as well as precautions to avoid them.¹⁷

Infections are indicated as the second hospitalization diagnosis, with 21.79%. Similar data were obtained in a study carried out in an ICU of a university hospital in Rio Grande do Sul, in which it was found that the main causes of hospitalization were due to infectious diseases, especially sepsis and septic shock, pneumonia, tetanus and bacterial meningitis. 18

It is pointed out, even though the types of infections have not been detailed in this study, that patients hospitalized in the ICU are more likely to trigger some type of infection in view of the need for invasive procedures. Among the main ones, central venous catheterization, bladder catheterization, orotracheal intubation, the use of mechanical ventilation and, also, arterial puncture.

Malignant neoplasms are also revealed as frequent causes of ICU admission, as observed in this study, with 13 cases (16.66%). It is understood that, frequently, cancer patients develop kidney lesions, requiring hemodialysis due to the high level of severity resulting from the organic decompensation of the disease in the individual.¹⁹

In another study, the main causes of ICU admissions of patients with acute kidney injury were: sepsis; respiratory diseases; cardiovascular diseases; polytrauma, and severe bleeding, reported in research as the conditions that make acute kidney injury (AKI) more feasible.²⁰ It should be emphasized that in this study only four polytrauma were found (5,12%).

It should be pointed out that the investigated institution has a general ICU and is not a reference for traumatic emergency and emergency, and there is another reference hospital in the city, explaining the small number of patients on hemodialysis with a diagnosis of polytrauma found in this study.

It is worth noting that, when comparing this study with another study, ¹⁸ the data about the patients' origin differ. It was observed that, in this study, 39 (50%) of the hospitalizations came from the transfer of other hospitals, probably due to the

characteristic of the region where the hospital is located, that is, the municipality in question is a pole among 18 other municipalities in the region south of the State of Mato Grosso.

In relation to the hospitalization agreement, 50 (64.10%) patients submitted to hemodialysis treatment in the ICU were admitted to the Brazilian National Health System (UHS), which reinforces the BSN's 2016 survey, which demonstrated the the same distribution of patients under hemodialysis treatment financed by public health system resources. 11 It is worth noting that, although essential for these patients, the use of hemodialysis as kidney replacement therapy in the ICU implies a high economic and social cost, since the daily cost of intensive hospitalization is extremely onerous, causing a financial impact on the system of health. 21

It should be noted that the hemodialysis complications that occur during the hemodialysis session may be occasional, but some are extremely serious and can be fatal. It is known that, currently, hemodialysis does not only seek to reverse uremic symptoms, but also reduces the complications inherent in the procedure itself and reduces the risk of mortality.²²

It was pointed out the prevalence of hypotension as an intradialytic complication in this study, associated with the hemodynamic fragility in the patient and also the primary reflex of the large amount of fluid that is extracted from the plasma volume during a routine dialysis session; the water, which is accumulated in the interdialytic range, is extracted directly by the ultrafiltration mechanism.²³

In this study, arterial hypertension was the second most frequent complication, also reported in another study, since the kidneys stimulate the production of vasoconstrictors and vasodilators. Hypervolemia and the inappropriate performance of the Renin-Angiotensin-Aldosterone System, hemodialysis, prevent the compensatory mechanism of vasodilation, raising blood pressure in patients.⁵ From this event, the nursing team's conduct during the hemodialysis treatment and the direct care to avoid complications due to hypertension.²³

During hemodialysis, patients with cardiac abnormalities (systemic arterial hypertension, congestive heart failure, hypovolemia, among others) may present a greater disposition to complications, since cardiac arrhythmias may be potentiated due to the circulation extracorporeal therapy of hemodialysis.⁴

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The need for a vascular access route is added to the hemodialysis procedure, and in this study 69 (88.46%) patients had a double lumen catheter (DLCT), a device generally implanted in regions of deep veins parallel to the proportions joints of the human body, such as jugular, subclavian or femoral veins, most commonly used in patients with indication of short-term treatment, such as in the ICU.²⁴

It can be seen that venous access through a catheter can also lead to intradialytic complications. In this study, 34 (13.82%) patients presented coagulation of the filter or the system and 20 (8.13%) presented lack of vascular access flow. It is pointed out that these cases arise from possible folds of the catheter within the vascular access and the formation of clots within the influencing the efficacy of suctioning of the blood flow through the catheter, when there administration of anticoagulants prescribed by the physician in the initiation of hemodialysis or when lavage of the line system by means of saline solution is insufficient.9

It is believed that, among the Nursing interventions regarding these complications, the nurse must have the skills to evaluate, systematize and decide the most appropriate behaviors in the various situations. Flushing of the saline flush system is indicated, reversal of the lines of the hemodialysis machine system, alteration of ultrafiltration, replacement of the hemodialysis machine line/filter system, hypotension, lack of vascular access flow and clot formation in the filter/system lines as conducts routinely performed by the Nursing team in the ICU work process.

It is emphasized that the success in the accomplishment of hemodialysis treatment is related to the availability of a Nursing team qualified for this treatment; ²³ for this, the nurse who works in the Intensive Care Unit must have decision-making capacity in order to guarantee an effective result of critical patient care and in hemodialysis treatment.³

It is emphasized that the intensive care provided to critical patients is directly related to the duties of the nurse, both in relation to planning activities, as well as in the decisions that involve the patient¹⁸ and also to the Nursing staff.

It is understood, in this context, the important role of the nurse in the care process in the ICU, providing the qualification of the Nursing team and the organization of the assistance focused on reducing the

possible complications to the patients in hemodialysis treatment.

It is considered that the limitations of this study can be adjusted in future studies by increasing the temporal cut and the inclusion of variables such as hospitalization time and comorbidities. The objective of this study was to identify and discuss the main intradialytic complications in patients admitted to the ICU and the importance of a trained nursing team to effectively intervene in hemodialytic complications.

CONCLUSION

It is concluded that the data obtained in the study portrays the reality of patients hospitalized Care in Intensive Units performing hemodialysis treatment, predominance of men, age 60 years or older, initial diagnosis of chronic kidney disease, with prevalence of hospitalization by means of of the Unified Health System. Among the main intradialitone complications, hypotension, arterial hypertension, cardiac arrhythmias and coagulation of the filter or hemodialysis system stand out.

Therefore, it is emphasized the need to implement educational measures, such as permanent education, in systematized care, in order to qualify nursing team decision-making and, consequently, reduce intradialitic complications.

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