



ORIGINALES

Occurrence of adverse events in public hemodialysis units

Ocorrência de eventos adversos em unidades públicas de hemodiálise

Ocurrencia de eventos adversos en unidades públicas de hemodiálisis

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<http://dx.doi.org/10.6018/eglobal.18.3.343361>

Received: 17/10/2018

Accepted: 21/01/2019

ABSTRACT:

Objective: Identify the adverse events occurring in hemodialysis units of the Federal District public network.

Methods: This is a descriptive study with a quantitative approach, carried out in Brasília / DF. Data were collected in three public hospitals of the Health's Secretary of the Federal District in the year 2017. These units, together, performed in the year 2017, 1770 hemodialysis sessions in patients with CKD per month. A total of 152 patient charts were analyzed to record adverse events. The data were organized in an Excel spreadsheet, and descriptive statistics were used for the analysis.

Results: Adverse events with the highest number of records are related to vascular access to hemodialysis, they are: bleeding, double-catheter secretion lumen, inadequate blood flow, and infection or signs of vascular access infection. As for the person responsible for the registration, 76.9% of the records were made by nursing technicians, 16.6% by nurses and 6.5% by other health team professionals.

Conclusion: It is concluded in this study that hemodialysis is a hospital sector with a great risk potential for the occurrence of adverse events, this occurs for several reasons such as: it is a complex procedure, using high technology, chronicity characteristic of chronic renal disease, the high use of medications. Strategies need to be taken in order to optimize the functioning of these vascular accesses, because the quality of dialysis depends on them, consequently the quality of life of the patient with chronic renal disease in dialysis treatment.

Key words: Renal dialysis; Patient safety; Nursing care; Chronic renal failure; Nursing in nephrology.

RESUMO:

Objetivo: Identificar os eventos adversos que ocorrem em unidades de hemodiálise da rede pública do Distrito Federal.

Métodos: Trata-se de um estudo descritivo com abordagem quantitativa, realizado em Brasília/DF. Os dados foram coletados em três hospitais públicos da Secretaria de Saúde do DF no ano de 2017. Essas unidades, em conjunto, realizaram no ano de 2017, 1770 sessões de hemodiálise em pacientes com DRC por mês. Foram analisados 152 prontuários de pacientes para levantamento dos registros de

eventos adversos. Os dados foram organizados em planilha do Excel, e utilizado estatística descritiva para a análise.

Resultados: Os eventos adversos com maior número de registros estão relacionados ao acesso vascular para hemodiálise, são eles: sangramento, secreção em cateter duplo lumen, fluxo sanguíneo inadequado e infecção ou sinais de infecção no acesso vascular. Quanto ao responsável pelo registro, 76,9% dos registros foram realizados pelos técnicos de enfermagem, 16,6% pelos enfermeiros e 6,5% por outros profissionais da equipe de saúde.

Conclusão: Conclui-se com este estudo que a hemodiálise é um setor hospitalar com um grande potencial de risco para a ocorrência de eventos adversos, isso ocorre por diversos motivos tais como, se tratar de um procedimento complexo, com uso de alta tecnologia, a característica de cronicidade da doença renal crônica, o alto uso de medicamentos. Estratégias precisam ser tomadas de forma a otimizar o funcionamento desses acessos vasculares, pois deles depende a qualidade da diálise, consequentemente a qualidade de vida do paciente com doença renal crônica em tratamento dialítico.

Palavras-chave: Diálise renal; Segurança do paciente; Cuidados de enfermagem; Insuficiência renal crônica; Enfermagem em nefrologia.

RESUMEN:

Objetivo: Identificar los eventos adversos que ocurren en unidades de hemodiálisis de la red pública del Distrito Federal.

Métodos: Se trata de un estudio descriptivo con enfoque cuantitativo, realizado en Brasilia/DF. Los datos se recopilaron en tres hospitales públicos de la Secretaría de Salud del DF en el año 2017. Esas unidades, en conjunto, realizaron en el año 2017, 1770 sesiones de hemodiálisis en pacientes con Insuficiencia Renal Crónica por mes. Se analizaron 152 historiales de pacientes para el levantamiento de los registros. Los datos fueron organizados en hoja de Excel, y se utilizó la estadística descriptiva para el análisis.

Resultados: Los acontecimientos adversos con mayor número de registros están relacionados con el acceso vascular para hemodiálisis, son: sangramiento, secreción en catéter doble lumen, flujo sanguíneo inadecuado e infección o señales de infección en el acceso vascular. Respecto al responsable del registro, 76,9% de los registros fueron realizados por los técnicos en enfermería, 16,6% por los enfermeros y 6,5% por otros profesionales del equipo de salud.

Conclusión: La hemodiálisis es un sector con un gran potencial de riesgo para la ocurrencia de eventos adversos, esto sucede por diversos motivos tales como, tratarse de un procedimiento complejo, con uso de alta tecnología, la característica de cronicidad de la enfermedad renal crónica, el uso alto de medicamentos. Deben adoptarse estrategias para mejorar el funcionamiento de estos accesos vasculares, pues de ellos depende la calidad de la diálisis y consecuentemente la calidad de vida del paciente con enfermedad renal crónica en tratamiento dialítico.

Palabras clave: Diálisis renal; Seguridad del paciente; Cuidados de Enfermería, Insuficiencia Renal Crónica; Enfermería en nefrología.

INTRODUCTION

Patient safety is defined by the World Health Organization (WHO) as reducing the risk of unnecessary harm associated with health care to an acceptable minimum. ⁽¹⁾

This theme has been increasingly disseminated within the institutions and among health professionals, regarding the search for the quality of care provided and the decrease in the occurrence of adverse events ⁽²⁾.

It is about reducing the risk of unnecessary damage associated with health care to an acceptable minimum. These damages are due to or associated with plans or actions taken during the provision of health care, unlike underlying diseases or injuries. ⁽³⁾

According to the Institute of Medicine (1999) health quality is defined as the degree to which services provided to the patient reduce the probability of unfavorable results, and increase the probability of favorable results, according to current scientific knowledge. The unfavorable results are adverse events (AD). ⁽⁴⁾

Thus, patient safety addresses the risks involved in health care to reduce or eliminate Adverse Events (AD), which are incidents that occur during health care delivery and which result in harm to the patient, which can be physical, social and psychological, which includes illness, injury, suffering, disability or death. ⁽¹⁾

Chronic kidney disease (CKD) consists of renal damage characterized by loss of function, progressively and irreversibly, making the kidneys unable to perform their glomerular, tubular and endocrine functions, thus initiating the accumulation of nitrogenous substances such as urea and creatinine⁽⁵⁾

Patients on hemodialysis, for example, have some characteristics that make them more vulnerable to the occurrence of AD, such as: critical health status due to the physiological consequences of renal failure, hemodynamic instability, multiple comorbidities and polypharmacy, among others. ⁽⁶⁾

The treatment of CKD depends on the evolution of the disease, which may be conservative with the use of medications, diets and water restriction, or renal replacement therapies such as hemodialysis, peritoneal dialysis and renal transplantation. ⁽⁷⁾

Data from 2017 show that, in Brazil, there is an estimated total of 126,583 patients in dialysis treatment. Of these, 91.8% use hemodialysis as a modality of renal replacement therapy. The estimated number of new patients on dialysis was 40,307 in 2017. ⁽⁸⁾

Authors claim that there is a high proportion of people with chronic kidney disease (CKD) who experience safety-related events. This factor highlights the vulnerability of this population to the potential adverse effects of health care. ⁽⁹⁾

The high complexity in health care increases the possibility of error and frequency of adverse events, in this sense it is important to identify the potential risks. ⁽¹⁰⁾

Estimating the frequency of ADs and identifying the most common causes have been important steps taken by several countries to draw attention to the seriousness of the problem and to stimulate the development of patient safety policies. ⁽¹¹⁾

In 2014 one study evaluated the prevalence of AD on hemodialysis. The author identified that the prevalence of AD per patient was 80.3% and that of AD per hemodialysis session was 17.4%. The most prevalent ADs were inadequate blood flow (40.6%), bleeding from venous access (11.6%), infection / signs of infection (9.6%) and coagulation of the extracorporeal system (7.1%). ⁽¹²⁾

Nursing professionals are responsible for a large part of the care actions and, therefore, are in a privileged position to reduce the possibility of incidents reaching the patient, in addition to detecting complications early and performing the necessary actions to minimize the damages.

The objective of this study was to identify the adverse events that occur in hemodialysis units of the public network of the Federal District.

MATERIAL AND METHOD

This is a descriptive study with a quantitative approach, carried out in Brasília / DF. The data were collected in three public hospitals of the Health's Secretary of DF in the year 2017. These units, together, performed in 2017, 1770 sessions of hemodialysis in patients with CKD per month.

The inclusion criteria of the study were patients older than 18 years, both sexes, with CKD in hemodialysis treatment in the three dialysis units, and the exclusion criteria were patients who refused to participate and patients with acute renal injury.

A total of 152 patient charts were analyzed for adverse event records. The data were organized in an Excel spreadsheet, and descriptive statistics were used for the analysis.

Study approved by the CEP-CONEP System of the Secretary of State for Health of the Federal District opinion: 1,689,123.

RESULTS

The 152 records included were equally distributed among women and men, 50.7% of the patients in the study were male and 49.3% were female. Most patients are married (53.3%) and have completed high school (43.3%). The predominant age group is 41 to 60 years (51.3%). Regarding the source of income, 40.7% receive INSS benefit, 72% consider the income limited.

Related to the health situation, the main etiology of chronic kidney disease is systemic arterial hypertension (44.7%). Regarding vascular access used for hemodialysis, 50.7% used the double lumen catheter while the other 49.3% used the arteriovenous fistula. Most patients undergo hemodialysis for more than 1 year (1 year to 5 years, 50%).

Table 1. Parameters of the treatment of patients undergoing hemodialysis in the Public Hospitals of the Health's Secretary of the Federal District, 2018. (N = 152)

Ultrafiltration	N	%
Less than 1000mL	08	5,3
1000 – 2000 ml	33	21,7
Above 2000 mL	111	73
Dry Weight	N	%
Above	56	36,8
In the Dry Weight	54	35,5
Below	16	10,6
Unregistered	26	17,1
Total	152	100

Regarding the data of the hemodialysis session, 73% of patients have an ultrafiltration greater than 2000mL as their medical prescription. Analyzing the weight after the hemodialysis session, 36.8% went above their dry weight while 35.5% left the dry weight.

Analyzing laboratory tests, the majority of patients are found to have serum potassium within normal values (50.6%). 35.5% present serum phosphorus values above the normality parameters. Regarding hematocrit and hemoglobin values, the majority presented rates lower than the reference values, 48.7% and 49.4%, respectively. The figures referring to absence of registration are: potassium 30.3%, phosphorus 31.6% and hematocrit and hemoglobin, 30.9%.

The Kt / V registry was not found in 94% of the patients.

Table 2 presents the records of adverse events reported in 152 medical records. There were 1305 records of adverse events.

Table 2. Occurrences of adverse event records in the Hemodialysis sector of the Public Hospitals of the Health's Secretary of the Federal District, 2018. (N = 1305).

Adverse Events	N	%
Bleeding from the venous access	488	37,4
Secretion in double lumen catheter	278	21,3
Inadequate blood flow	251	19,2
Infection/signs of infection	102	7,8
Coagulation	96	7,4
Infiltration	33	2,5
Inadequate attachment of catheter	30	2,3
Other	27	2,1
Total	1305	100

The most frequent adverse event was bleeding due to venous access (37.4%), followed by double lumen catheter secretion (21.3%) and inadequate blood flow (19.3%).

As for the person responsible for the registration, 76.9% of the records were made by nursing technicians, 16.6% by nurses and 6.5% by other health care professionals.

DISCUSSIONS

The association between hypertension and chronic kidney disease is well known, as both maintain a cause and effect relationship. SAH is the underlying disease that prevails in patients with nephropathies in Brazil. Elevated pressure levels for years determine progressive structural changes in the renal arteries, such as hypertrophy of the muscular layer, leading to CKD. ⁽¹⁴⁾

This result is in agreement with data from the census of the Brazilian Society of Nephrology (SBN) in 2017, which described that the most common causes of CKD were systemic arterial hypertension (SH) 34%, diabetes mellitus (DM) 31% 10%

glomerulonephritis, polycystic kidneys 4%; other causes 10% and the diagnosis was not defined in 10% of the cases. ⁽⁸⁾

In a study aimed at assessing adverse events in patients with CKD, diabetic patients were 2.9 times more likely to have three or four adverse events compared to non-diabetic patients. ⁽⁹⁾

As for vascular access, the AVF consists of the subcutaneous anastomosis of an artery with a vein, causing the venous branch of the fistula to distend and the walls thicken in approximately 30 days after the procedure, allowing the frequent insertion of needles, in addition to allowing adequate blood flow, from 300 to 500 mL / min, for hemodialysis. AVF is considered the ideal venous access for patients with CKD ⁽¹⁵⁾

According to the SBN census of 2017, the estimated percentage of hemodialysis patients with venous access for AVF in Brazil is 75.1%; for a temporary central venous catheter, it is 9.8% and permanent is 12.8%; use of vascular graft (prosthesis) is 2.3%⁽⁸⁾

The results found in the study differ from the Brazilian scenario because, in the public units of the Federal District, most patients undergo hemodialysis through the double lumen catheter.

It is worth mentioning that arteriovenous fistula (AVF) is the most adequate and safe venous access, since it is the long-stay access that enables effective dialysis with fewer interventions. ⁽¹⁶⁾

For HD, the patient needs a vascular access (AV) that offers adequate blood flow, long half life and low rate of complications. Arteriovenous fistula (AVF) is the ideal AV, to the detriment of the double central (CDL) or triple lumen catheters and the polytetrafluoroethylene (PTFE) arteriovenous graft. ⁽¹⁷⁾

Health care-related infections (ARI) are persistent adverse events in health services. It is known that infection leads to a considerable increase of costs in the care of the patient, besides increasing the length of stay, morbidity and mortality in the country's health services. ⁽¹⁸⁾

Studies show that catheter-related infections can be reduced when prevention measures are properly applied, such as use of aseptic technique prior to insertion, at each device handling and dressings, antisepsis at the exit site of the catheter with 2% alcoholic chlorhexidine, proper teamwork (sterile gloves, masks, protective goggles and aprons), care in catheter maintenance, monitoring of signs of infection, continuing education of team members, and self-care guidelines for the patient ^(19, 20)

Nursing is responsible for the prevention and control of access-related infections, which can ensure a safer practice by developing protocols for access management in hemodialysis patients.

Problems associated with AV dysfunction are the most common cause of increased morbidity, mortality, and hospital admissions of HD patients, reflecting large clinical, social and financial burdens, even for developed countries. ⁽²¹⁾

Patients older than 5 years of HD have better quality of life scores when compared to patients with shorter treatment times. ⁽²²⁾

The good level of understanding of the disease and aspects of treatment also positively influences patient adaptation and adherence to treatment. ⁽²²⁾

This factor could reflect a lower occurrence of adverse events related to hemodialysis treatment. ⁽²³⁾

Dry weight is the target weight to be achieved post hemodialysis below which all or most of the excess fluid has been removed without developing hypotension symptoms

Adherence to adequate fluid intake is commonly measured by interdialytic weight gain (GPID).

Studies have shown a relationship between elevated GPID and complications such as hypertension, congestive heart failure and even death. In addition, removal of this excess fluid during hemodialysis (HD) may result in episodes of hypotension, muscle cramps, nausea and headache. ⁽²⁴⁾

Adherence to dietary and fluid restrictions improves laboratory parameters, reduces complications such as hospitalizations for acute lung edema and improves the quality of life of patients in HD. ⁽²⁵⁾

The nursing team has an important role in this process, which consists in noting the correct weight of the patient when starting and ending a session, receiving the patient observing his general condition, performing vital signs control throughout the session, in order to minimize the occurrence of adverse events.

Secondary hyperparathyroidism occurs early in the course of chronic kidney disease, mainly due to retention of phosphorus, hypocalcemia and low levels of calcitriol. These changes, associated with bone resistance and the action of parathyroid hormone (PTH), lead to hypertrophy and hyperplasia of the parathyroid gland. Among the factors mentioned, phosphorus retention seems to be the main factor in the genesis of hyperparathyroidism in the development of osteoarthritis and in the installation of tissue calcifications, including cardiocirculatory. ⁽²⁶⁾

Concerning potassium, dialysis-induced hypokalemia is one of the main risk factors for the occurrence of arrhythmias ⁽²⁷⁾

Nurses should be aware of the control of these parameters, as failure to observe these changes may lead to adverse events.

The quality of dialysis offered to patients can be measured by Kt / V. The Kt / V represents the suitability of the dialysis, in this study it is observed that there is no kt / V record in 94% of the analyzed charts.

There is a correlation between hemodialysis (HD) dose and patient morbidity and mortality, so to estimate whether patients with CKD in HD receive adequate treatment, the HD dose should be measured. Clinical signs and symptoms are very important, but they are not sufficient indicators of the dose of dialysis ⁽²⁷⁾

The evaluation of Kt / V is a nursing care and refers to the offer of a quality dialysis to the patient. There are several factors related to obtaining an ideal KTV, and it is important to emphasize that the patient needs to adhere to the treatment according to what he recommends, ie, perform the dialysis time, follow the diets, take medication, and take care of vascular access. The other part is the multidisciplinary team that includes providing the guidelines. The dialysis service must be committed to the treatment, offering an ideal capillary according to body mass, good venous access, and correct adequacy during treatment. ⁽²⁸⁾

As for adverse events, it is observed that the highest number of registry is related to vascular access. This does not mean that other adverse events are not present, but in this study only the records in the medical record were evaluated. To verify the risk potential for the event would have to do another type of study design and analyze more robust statistics as the correlation and not only the descriptive statistical analysis.

The purpose of nursing records is to establish an effective communication between the nursing team and other professionals responsible for the treatment of the patient, to serve as a basis for the preparation of the patient care plan, to serve as an evaluation tool for the care provided, to accompany the evolution of the patient, to constitute a legal document, both for the patient and for the team regarding the assistance provided, to contribute to the nursing audit and to the teaching and research in nursing⁽²⁹⁾

One result found in this study is that the largest number of records was performed by the nursing team, among the team members, the nursing technicians performed the highest number of records. This is related to the performance of the nursing technician in the direct assistance to the patient on hemodialysis and to the greater amount of this professional in the dialysis team.

The hemodialysis legislation states that it must contain at least the following professionals at each shift: one nurse and one doctor for every thirty-five (35) patients and one nurse technician or auxiliary for each four patients per shift of Hemodialysis⁽³⁰⁾

Communication should take place effectively among health professionals so that the client's needs are more closely observed, understood and addressed ⁽²⁹⁾

CONCLUSIONS

It is concluded with this study that hemodialysis is a hospital sector with a great risk potential for the occurrence of adverse events, this occurs for several reasons such as, it is a complex procedure, using high technology, the characteristic of chronicity of chronic kidney disease, high drug use.

The most frequent adverse events related to vascular access for hemodialysis are bleeding, double lumen catheter secretion, inadequate blood flow, and infection or signs of vascular access infection.

The health situation of the Federal District is not very different from the rest of Brazil. It is necessary to invest in public health policies to improve this current context.

It is believed that the occurrence of adverse events on hemodialysis is much greater. This study demonstrated a greater number of registries involving vascular access for hemodialysis. Strategies need to be taken in order to optimize the functioning of these vascular accesses, since they depend on the quality of the dialysis, consequently the quality of life of the patient with chronic renal disease in dialysis treatment. One limitation of this study lies in the fact that it is based on records in medical records which may not include all the adverse events that occur in practice.

Nursing needs to improve the quantity and quality of records. The purpose of nursing records is to establish an effective communication between the nursing team and other professionals of the health team, as well as to serve as a basis for the development of care strategies.

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ISSN 1695-6141

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