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PATIENT WITH CHRONIC KIDNEY DISEASE UNDERGOING HEMODIALYSIS TREATMENT: CLINICAL COMPLICATIONS

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ABSTRACT

A The emergence of new technological advances in hemodialysis treatment over recent decades has made this technique both effective and safe, capable of sustaining patients' lives for long periods. The understanding of what constitutes adequate dialysis has evolved over the years; currently, dialysis treatment aims to reverse uremic symptoms and reduce the risk of mortality. It is well known that in approximately 30% of hemodialysis sessions, some type of complication may occur — these may be occasional, but some are extremely severe and even fatal. Therefore, the continuous evaluation of such complications must be an integral part of the clinical follow-up of patients. The present study aims to assess the clinical complications of patients with chronic kidney disease (CKD) undergoing hemodialysis at a University Hospital in southern Minas Gerais, Brazil.

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INTRODUCTION

Chronic kidney disease (CKD) is a progressive and markedly irreversible process resulting from a decline in kidney function accompanied by a reduction in the glomerular filtration rate. In the early stages, CKD has nonspecific symptoms or is asymptomatic; the characteristic clinical presentation occurs when kidney function impairment is advanced, and therefore individuals with CKD have higher rates of developing heart disease, cognitive decline, anemia, mineral and bone disorders, intoxication due to impaired excretion of metabolic waste, endocrine dysfunctions associated with vitamin D and secondary hyperparathyroidism, alterations in the central and peripheral nervous system, in addition to the potential complications resulting from hemodialysis (2). With the emergence of new technological advances, hemodialysis treatment has become effective and safe, capable of prolonging the lives of patients for long periods. However, the chronic condition and hemodialysis treatment are sources of physical stress. It is known that in 30% of hemodialysis sessions, some type of complication can occur, which may be occasional, but some are extremely serious and fatal. Therefore, the constant evaluation of these complications should be included in the clinical follow-up of patients.

MATERIALS AND METHODS

This study, approved by the Ethics Committee of UNIFENAS under number 3.149.314, is descriptive with a qualitative methodology. It was developed in the Hemodialysis service belonging to the University Hospital in the municipality of Alfenas, MG. All patients assisted by the aforementioned institution, over 18 years of age, of both sexes, were included in this study, after signing the informed consent form. For the development of this study, researchers collected 4 mL samples of venous whole blood, vacuum-sealed in tubes without anticoagulant, to obtain serum for screening tests for hepatitis C. The biological samples were kept at room temperature and processed within a maximum of two hours after collection. No other type of biological sample collection was performed.

The assays were performed using an immunochromatographic method for the qualitative determination of anti-HCV IgM and IgG antibodies, using synthetic and recombinant antigens immobilized on the membrane for selective identification of anti-HCV, in a minimal serum or blood sample. The anti-HCV antibodies present in the sample bind to the human anti-gamma globulin - colloidal gold conjugate, forming a complex. This flows through the membrane of the test plate, binding to the immobilized HCV antigens in the positive reaction area (T), resulting in the appearance of a light pink colored band. In the absence of anti- HCV, the colored band will not appear in area T. The reaction mixture continues to flow, reaching the control area (C). The unbound conjugate binds to the reagents in this area, producing a light pink colored band, demonstrating that the reagents are working correctly. The rapid tests were performed simply, without the need for laboratory infrastructure. The results are obtained in up to 20 minutes and are easy to read and interpret. Data collection from patient records at the Hemodialysis service of the Alzira Velano University Hospital (Alfenas, MG) was carried out from January to December 2019. The sociodemographic variables collected were age, sex, and ethnicity. Data regarding the medical history and clinical variables (underlying disease, associated pathologies, and clinical complications) were transcribed from the medical records onto a specific form for this study.

RESULTS

Of the total (n=47) evaluated population, n=30 (63.9%) are male and n=40 (85.1%) reported leukoderma. The predominant age range among male patients was between 51 and 70 years n=14 (29.7%); among women, between 31 and 60 years n=13 (67.6%). It is noted that n=43 (91.4%) have been on hemodialysis for 10 years and n=4 (8.5%) for more than 10 years. The evaluated clinical data show underlying diseases in descending order of incidence: hypertension n=22 (46.8%), hypertension and diabetes mellitus n=5 (10.6%), chronic kidney disease n=3 (6.4%), polycystic kidney disease n=2 (4.2%), focal segmental glomerulosclerosis, nephritis, vesicoureteral reflux and hydronephrosis respectively n=1 (2.1%). It was observed that n=30 (63.8%) did not present associated pathologies, n=2 (4.2%) had a diagnosis of gout; chronic venous disease, dyslipidemia, heart failure, chronic arterial disease; glaucoma and dyslipidemia; gastritis and bronchitis; hepatitis C, hyperthyroidism, hypothyroidism, COPD, chronic venous disease and hypothyroidism; hypothyroidism and bronchitis; arthropathy and retinopathy respectively n=1 (2.1%). The clinical complications associated with dialysis treatment were n=3 (6.4%): lower limb edema; lower limb amputation, uremia, hyperphosphatemia, kidney transplant respectively n=2 (4.2%); Renal agenesis, stroke, weakness and edema of lower limbs and malnutrition and low back pain, uremia, lower limb edema and central catheter infection, mucocutaneous pallor, osteoporosis, uremia and low back pain, abdominal pain and dyspnea respectively n=1 (2.1%). There were no clinical complications in n=28 (59.5%). Anemia was developed by n=27 (57.4%), since hemoglobin was below 12 g/dL.

DISCUSSION

Diabetes and hypertension are the main causes of CKD in all developed countries and in many developing countries, but glomerulonephritis and unknown causes are more common in underdeveloped countries. These differences are related to the decrease in birth rate and the increase in life expectancy in developed countries; to infectious diseases; to lifestyle, involving pollution, pesticides, excessive use of medications and others. High blood pressure, diabetes mellitus and obesity are the main risk factors for CKD worldwide. Infections can also affect the kidneys through immunological mechanisms involving antigens capable of creating circulating or in situ immune complexes, as in cases of glomerulonephritis, or can cause disturbances in innate and cellular immunity, as in infection-related glomerulonephritis. Among the infectious causes of CKD, hepatitis B and C and infection with the human immunodeficiency virus (HIV) stand out. HCV is now the leading cause of liver disease among patients with CKD undergoing dialysis treatment. Patients with CKD undergoing hemodialysis treatment have an increased risk of acquiring the hepatitis C virus (HCV) due to several risk factors, among which the main ones are blood transfusion, hemodialysis time, dialysis modality (hemodialysis or peritoneal dialysis), and the prevalence of infection in the unit. High prevalence rates have been detected in dialysis units worldwide. Recent studies have shown that HCV infection negatively interferes with the survival of patients on hemodialysis and those undergoing kidney transplantation, and have also shown that, despite the various measures adopted in hemodialysis units, HCV infection continues to prevail. Kidney diseases associated with HIV infection can be caused by several mechanisms, such as direct HIV invasion, formation of immune complexes, use of medications to treat HIV infection, dehydration, and other bacterial and viral co-infections. Other risk factors that should be considered are dyslipidemia, sex, age, race/ethnicity, and smoking. Kidney damage can occur as part of sepsis due to related multiple organ failure, i.e., systemic inflammatory response syndrome. Therefore, it is recommended that all patients with CKD be tested for HCV before starting hemodialysis. In addition, all patients whose HCV serology is positive should receive interferon-free antiviral treatment. Most patients are male and have leukoderma. The average age was higher in males, at 55.6 years, compared to 47.8 years in females. The predominant underlying disease is hypertension, followed by diabetes mellitus. Most have been on dialysis treatment for 10 years and had no associated pathologies. There was a predominance of patients without associated clinical complications, and of those who did present complications, most developed anemia.

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