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# PROFILE OF THE PATIENT USINGE A CENTRAL VENOUS CATHETER DURING HEMODIALYSIS

## PERFIL DO PACIENTE EM USO DE CATETER VENOSO CENTRAL EM HEMODIÁLISE

## PERFIL DEL PACIENTE EN USO DE CATÉTER VENOSO CENTRAL DURANTE HEMODIÁLISIS

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**ABSTRACT**

***Objective***: to identify the epidemiological profile of patients undergoing hemodialysis and the technical aspects of using temporary central venous catheter double lumen (CTDL). ***Method***: a descriptive exploratory study in private hemodialysis unit with 57 patients, aged >18 years old and <60 years old in treatment for 90 days. The information was processed in Excel® and discussed based on the literature. ***Results***: 75% were male, aged 20 to 59 years old, 57% were Catholics; 46% had elementary school, 20% were illiterate; etiology: 50% had hypertensive nephropathy, 35% had diabetic nephropathy, 10% had chronic glomerulonephritis; 70% had CTDL in right internal jugular vein; removal: 70% maturation of arteriovenous fistula; 20% infection; Kt/V 1.1 to 1.2; blood flow higher than 250 ml/min. ***Conclusion***: the multidisciplinary team should reduce the potential risks of using CTDL and promote improved quality of life associated with health. ***Descriptors***: Renal dialysis; Renal Insufficiency; Catheters; Quality of Life; Nursing.

**RESUMO**

***Objetivo:*** identificar o perfil epidemiológico dos pacientes submetidos à hemodiálise e os aspectos técnicos do uso de cateter venoso central temporário de duplo lúmen (CTDL). ***Método:*** estudo descritivo-exploratório, realizado em unidade de hemodiálise privada, com 57 pacientes, idade>18 anos e < 60 anos, em tratamento há 90 dias. As informações foram processadas no Excel® e discutidas à luz da literatura. ***Resultados:*** 75% sexo masculino; idade entre 20 e 59 anos; 57% católicos; 46% ensino fundamental; 20% analfabetos; etiologia: 50% nefropatia hipertensiva, 35% nefropatia diabética, 10% glomerulonefrite crônica; 70% CTDL em veia jugular interna direita; retirada: 70% maturação da fístula arteriovenosa; 20% infecção; Kt/V 1.1 a 1.2; fluxo de sangue maior que 250 ml/min. ***Conclusão***: a equipe multidisciplinar deve diminuir os riscos potenciais do uso do CTDL e favorecer a melhora da qualidade de vida associada à saúde. ***Descritores:*** Diálise Renal; Insuficiência Renal; Cateteres; Qualidade de Vida; Enfermagem.

**RESUMEN**

***Objetivo:*** identificar el perfil epidemiológico de los pacientes sometidos a la hemodiálisis y los aspectos técnicos del uso de catéter venoso central temporario de lumen duplo (CTDL). ***Método:*** estudio descriptivo-exploratorio, realizado en unidad de hemodiálisis privada, con 57 pacientes, edad >18 años y < 60 años, en tratamiento hay 90 días. Las informaciones fueron procesadas en el Excel® y discutidas basados en la literatura. ***Resultados:*** 75% sexo masculino, edad entre 20 a 59 años, 57% católicos; 46% enseñanza fundamental, 20% analfabetos; etiología: 50% nefropatía hipertensiva, 35% nefropatía diabética, 10% glomerulonefritis crónica; 70% CTDL en vena yugular interna derecha; retirada: 70% maturación de la fístula arteriovenosa; 20% infección; Kt/V 1.1 a 1.2; flujo de sangre mayor que 250 ml/min. ***Conclusión***: el equipo multidisciplinar debe diminuir los riesgos potenciales del uso del CTDL y favorecer la mejoría de la calidad de vida asociada a la salud. ***Descriptores***: Diálisis Renal; Insuficiencia Renal; Catéteres; Calidad de Vida; Enfermería.

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## INTRODUCTION

Chronic kidney disease (CKD) is considered a pandemic disease by the World Health Organization. In the context of each country, it is a serious public health problem, considering its high incidence in the population, generating strong impact on the reduction of economic and social activity, requiring expert assistance to monitor the patient by dialysis technique (peritoneal dialysis or hemodialysis) or renal transplantation.[1,2]

CKD is characterized by the presence of kidney damage associated with decreased glomerular filtration rate to less than 60 mL/min/1.73 m2 for three or more months. It is a syndrome from the slow and progressive loss of functional capacity of the kidney to maintain body homeostasis. Its pathophysiology is complex and involves elevated serum levels of urea, accumulation of other final products of the metabolism, electrolyte, and hormonal changes, loss of calcium and phosphorus balance, among others, in the human body. The main causes are glomerulonephritis, obstructive and systemic diseases, especially hypertension and diabetes, and congenital malformations.[3]

Estimates of the Brazilian Society of Nephrology indicate that in Brazil, there are 100,397 patients on dialysis. This number has increased gradually over the years. Currently, the average growth of patients in the program for the past three years is about 3%.[2,3]

Hemodialysis is the replacement therapy modality of renal function used on a large scale for patients with terminal CKD (TCKD) in Brazil and worldwide. In the domestic scenario, 89.6% of patients treat through this method, involving several aspects that must be carefully evaluated, including the need to have a vascular access (VA). It is obtained basically in two ways: by making the arteriovenous fistula (AVF) or the implantation of central venous catheter double lumen.[4]

The central venous catheter with a double lumen is subdivided into two types: tunnel and non-tunnel. In the first, the implantation technique requires greater care apparatus for requiring a medical vascular surgeon. IN the constitutive point of view, this catheter is classified as long-term for possessing Dacron 'cuff'. The purpose of the 'cuff' is to form a mechanical barrier against microorganism penetration and subcutaneous vascular bed. The second type, central venous catheter double non-tunnel lumen is obtained by the technique of percutaneous and has no 'cuff', being classified as a short stay. Thus, the temporary central venous catheter non-tunnel double lumen (CTDL) constitutes one of the main alternatives used to obtain the VA in clinical practice, making the national scene frequency of 9.4%.[2,5]

In Brazil, the vascular access through CTDL is within the routine activity of nephrologist, who favors the ready use in situations of assistance to individuals who require hemodialysis support. It is indicated in emergency cases hemodialysis or in situations where is not possible the use of the VAF. On the other hand, it is related to increased rates of infection, hospitalization, and mortality in patients on therapy. It should be implanted, preferably in the jugular vein, where they are fewer complications. The second choice is between the femoral vein and, finally, the subclavian veins.[4,5]

The vascular access obtained by CTDL's main advantages are being painless during hemodialysis session, convenience, the speed of deployment, producing low venous resistance and, when it is removed, it is easy to operate, with the minimal adverse event. As a technical complication, in the adequacy of dialysis, there is the risk of low blood flow, caused mainly by reducing its permeability (partial obstruction of the lumen), or improper positioning of the catheter tip. This condition creates a reduction in urea by the filter clearance rate (capillary) used in hemodialysis session, leading to worsening clinical manifested by worsening signs and uremic symptoms.[6]

The justification and the relevance of the study are focused on the fact that the CTDL is widely used in the care provided to patients who require hemodialysis, generating health risk situations, increasing morbidity and mortality. Therefore, it is necessary to know the epidemiological and technical assistance features surrounding the CTDL use, aiming to resolve doubt and establish forms of behavior that would minimize potential risks. With those considerations, the study aims to:

Identify the epidemiological profile of patients undergoing hemodialysis and the technical aspects of using temporary central venous catheter double lumen.

## METHOD

Descriptive and exploratory study with a quantitative approach, performed in a private hemodialysis unit, located in the city of the state of Minas Gerais, Brazil. The unit has 180 patients on dialysis and has a multidisciplinary team, composed of three specialist nurses in nephrology, four nephrologists, a pharmacist,

a social worker, a nutritionist, a psychologist and a doctor vascular surgeon.

Data collection was conducted from October 2014 to October 2015, through hospital records of patients on hemodialysis and the study period used the CDTL. In this period, 175 patients underwent hemodialysis three times per week, with an average duration of four hours. Inclusion criteria were adults of both genders; aged >18 years old and <60 years old in treatment for at least 90 days. The sample consisted of 57 patients.

A data collection instrument was created to record the information contained in the medical records of the socio-demographic data, aspects related to implant CTDL, dialysis evaluation parameters and laboratory tests of interest. The variables analyzed were gender, age, education, marital status, the cause of TCKD, catheter implant site, removal of causes and hemodialysis dose measured by Kt/V index. The data were entered into a database Excel® program proceeding to the descriptive statistical analysis by calculating the simple absolute and relative frequencies, discussed based in the scientific literature.

The study project was approved by the Ethics Committee on Research of the Federal University of Minas Gerais/UFMG, under CAAE 11813512.1.0000.5149 on 20 February 2013. The request is by Resolution 466/12 of the National Council of health, protecting the anonymity of people on treatment and the professionals who carried out the records.

## RESULTS

From the 57 patients of the study sample, 35.6% of individuals were attended in the research institution. Of them, 75.0% were male. The age ranged from 20 to 59 years old. The socio-demographic characteristics are shown in Table 1.

Table 1. Socio-demographic characteristics of patients using CTRL - hemodialysis unit in the state of Minas Gerais (MG), Brazil, 2015.

| Characteristics | n=57 | % |
|---|---|---|
| Gender | | |
| Male | 43 | 75 |
| Female | 14 | 25 |
| **Age** | | |
| 20-29 | 07 | 12 |
| 30-39 | 07 | 12 |
| 40-49 | 22 | 40 |
| 50-59 | 21 | 36 |
| **Education** | | |
| Illiterate | 12 | 20 |
| Elementary School | 27 | 46 |
| High School | 13 | 25 |
| Higher Education | 05 | 09 |
| **Religion** | | |
| Catholic | 30 | 57 |
| Evangelic | 25 | 33 |
| Without religion | 02 | 10 |
| **Marital Status** | | |
| Married | 37 | 64 |
| Single | 18 | 23 |
| Widow | 02 | 13 |
| **Etiology of TCKD** | | |
| Hypertensive Nephropathy | 29 | 50 |
| Diabetic Nephropathy | 14 | 35 |
| Chronic glomerulonephritis | 09 | 10 |
| Other | 05 | 05 |

In Table 2, it is observed the characteristics related to the site of the implant of CDTL, causes of catheter removal, hemodialysis dose and measured by Kt/V. It was found that 70% of patients achieved Kt/V from 1.1 to 1.2 with blood flow higher than 250 ml/min.

Table 2. General characteristics of the CTDL implant and its technical aspects of dialysis - hemodialysis unit in the state of Minas Gerais (MG), Brazil, 2015.

| Characteristics | n=57 | % |
|---|---|---|
| Place of the implant | | |
| Right internal jugular vein | 32 | 70 |
| Right subclavian vein | 17 | 20 |
| right femoral vein | 08 | 10 |
| Removal causes | | |
| Maturation | 30 | 70 |
| Infection | 15 | 20 |
| Coagulation | 05 | 04 |
| Other | 07 | 06 |
| Kt/V | | |
| 0.8-1.0 | 09 | 10 |
| 1.1-1.2 | 38 | 70 |
| 1.3-1.4 | 10 | 20 |

## DISCUSSION

This study identified the prevalence of males in hemodialysis treatment by CTDL. Survival studies in patients with CKD in this therapeutic modality, also indicate the predominance and especially show cardiovascular disease as the leading cause of mortality.[7]

On the world stage, just over one million people are undergoing hemodialysis, and more than half have over 65 years old. In the studied patients, ages ranged between 20 and 59 years old. This result points to a new profile of patients with CKD. The elderly, generally regarded as the risk group are no longer alone as victims of CKD because there is evidence about increasing numbers of young and middle-aged people, especially in emerging countries. It is noteworthy also that the population is aging, so there will be growth in the number of people over the fifth decade of life on dialysis. This variable has been implicated as a risk factor for mortality and decline in quality of life-related to health (HRQOL).[7]

The HRQL is defined as the person's perception of their health through a subjective evaluation of their symptoms, satisfaction, and adherence to the proposed treatment. The TCKD sharply reduces the physical, technical operation and affects the person´s perception of their health, resulting in a negative impact on energy levels and vitality, which can reduce or limit social interactions and cause problems related to the mental health of the patient.[8]

Hemodialysis is most of the time a life expectancy for patients, paradoxically, it is generating emotional conflicts and serious and deep situational, expressing the difficulty of adherence to treatment, the non-acceptance of the disease, the derogatory sense of self, the crisis in interpersonal relationships with family members, spouse, and broader social life. Furthermore, the treatment can lead to frustration and limitations, since it is accompanied by various restrictions, such as maintaining a specific diet associated with fluid restriction and modification in body image due to the presence of the catheter for vascular access or fistula arteriovenous. All these situations produce a downtrend HRQOL in TCKD patient with hemodialysis treatment.[7,8]

Thus, the multi-professional health staff has to effort to patient's treatment adaptation be proceeded. Thus, the professional relationship must be permeated by an attitude of support, personal valuation, respect, warmth, and compassion, as well as high technical and scientific expertise. Such elements can provide the best patient condition adjustment to his new reality.[7]

In the study, 57% of patients reported having the Catholic faith. Research shows that the dimension of spirituality is favorable for the adaptation of the individual facing the health situations of rupture or existential crises. The mechanism by which spirituality influences the health and well-being are unclear, although researchers and clinicians believe that spirituality and health have important connections. It is recognized that chronic disease disrupts various areas of their lives, being in triggering source of depression, irritability, loss of hope and anguish.[9]

Spirituality can increase the sense of purpose and meaning of life, which are associated with greater resistance to stress related diseases. The search for purpose in life and the experience of moving to the transcendental meeting, it seems important to face up to chronic disease. In this sense, the multidisciplinary health team should be attentive to provide the patients, the dimension, aiming at giving support before the treatment.[8-10]

On education, it was shown that 46% of patients had primary, and 20% were illiterate. This condition is a risk factor for reduction in HRQOL, ratified by national and international studies. It is argued that the higher the education, the greater access to information and better economic condition, making them more capable patients to assess traumatic events.[3]

Thus, the risk for a reduced HRQOL is high in patients with low level of education, because, besides the little access to information, there is an interruption of their work activities, since the jobs usually available require the preservation of their physical strength, which in TCKD it is compromised.[3]

Scientific evidence indicates that individuals with few resources, low education, those from ethnic or racial minorities, indigenous origin, or social risk, suffer from high rates of TCKD and contribute to the associated complications.[11]

About 1.2 billion people live in extreme poverty and have low educational levels worldwide. This condition reinforces unhealthy behaviors, reduced access to health and environmental exposure. In this condition, patients with TCKD are more susceptible to various diseases due to lack of access to goods and services, especially drinking water, sanitation, information on preventive behaviors, proper nutrition and reduced access to health care. Thus, care planning by the professional staff should consider this feature, aiming to rescue the hemodialysis patient citizenship and autonomy.[11]

About the cause, it was found that 50% had hypertensive nephropathy as the cause of TCKD, diabetic nephropathy with 35%, chronic glomerulonephritis with 10%. Similar data were identified in the survey Brazilian Chronic Dialysis 2013: 35% hypertension, 30% diabetes followed by 12% chronic glomerulonephritis, 4% polycystic kidney, 12% other diagnoses and 8% undefined. There was no significant change in these percentages over the last three years.[2]

The genesis of hypertensive nephropathy is on the rise in blood pressure. High blood pressure (hypertension) and renal function are closely related and can hypertension be both a cause and a consequence of kidney disease. In malignant form, hypertension may determine a severe renal injury, microvascular nature, characterized by myointimal proliferation, called malignant nephrosclerosis. This condition can cause, very often and soon the picture of TCKD, if hypertension is left untreated.[1,2,7]

Chronic hypertension, non-malignant, can also determine picture kidney injury also microvascular nature, characterized in arteriosclerosis hyaline, but with slower and less aggressive course, known as benign nephrosclerosis. However, this can also lead to TCKD. The malignant and benign forms of nephrosclerosis, which together they are called as hypertensive nephrosclerosis, determine high prevalence of hypertension in the general population, identified in the national scene, as the first cause of death for patients with TCKD followed by diabetic nephropathy, of patients starting hemodialysis.[1,2,7]

It is known that the presence of hypertension exacerbates patient cardiovascular repercussions with CKD, developing left ventricular hypertrophy, heart failure and the risk of coronary artery disease, among others. CKD is an independent cardiovascular risk factor that increases progressively with the loss of renal function, with the rate of 60% in patients on chronic hemodialysis. The main mechanism of hypertension in CKD associated with progressive loss of kidney's ability to excrete sodium, resulting in saline overload and volume. However, other mechanisms may be involved, such as increased production of vasoconstrictors, decreased vasodilatory and impaired endothelial function with reduced nitric oxide synthesis.[1,2,7]

The therapeutic approach to control blood pressure in the presence of CKD should start by dietary measures and lifestyle changes. The recommendations for diet must adapt the components to the different stages of CKD. Also, weight reduction when the body mass index is greater than 25 kg/m2 and weight maintenance if the index is below 25 kg/m2, are part of the recommendations for the individual with hypertension and CKD. Exercise and physical activity, reducing alcohol consumption and smoking cessation are important measures that help in controlling blood pressure and reducing cardiovascular risk.[1]

It is noteworthy also that all the different classes of antihypertensive drugs are effective, it is often a necessary association of several antihypertensive drugs. However, it has been shown that drugs that inhibit the renin-angiotensin system, such as inhibitors of angiotensin converting enzyme (ACE) inhibitors and blockers, angiotensin receptor blockers (ARBs) are more effective than other antihypertensive classes, particularly in diabetic nephropathy and nondiabetic hypertensive patients.[1,2]

However, the patients in the study were already on hemodialysis therapy, the control of blood pressure becomes vitally important for reducing morbidity and mortality. In this sense, the control measures such as use of antihypertensive drugs of ACE inhibitors and ARBs group, exercise, anemia correction, diet, control interdialytic weight gain, reduced intake of salt and fluids, are effective actions, among others, for the maintenance of patients on dialysis and therefore generate quality of life since they prevent serious complications that may affect the lifestyle of these people.[1,2]

The second cause found in this study was diabetic nephropathy (DN). It affects about 10 to 40% of diabetic patients. It is a clinical syndrome characterized by proteinuria and impaired renal function, albuminuria and high blood pressure. Other conditions associated with this syndrome are the progressive increase of dyslipidemia, decreased glomerular filtration rate (GFR) and increased risk of cardiovascular morbidity and mortality.[2,12]

The association between DN and heart disease (CHD) is well defined. The type 1 and 2 diabetic patients with proteinuria have increased mortality from cardiac causes. The basis for prevention and treatment of ND and associated CHD is the aggressive treatment of risk factors.[12]

The pathophysiology of diabetic kidney disease is complex, covering hemodynamic factors, plasma concentrations of the end products of advanced glycosylation, endothelial dysfunction, among others, and the main risk factors are hyperglycemia, hypertension, dyslipidemia, and genetic susceptibility.[12]

The DN is an important chronic complication of diabetes and is associated with increased mortality in patients. The renal related structural alterations are characterized by increased glomerular basement membrane thickening of the tubular basement membrane, diffuse mesangial sclerosis and microaneurysms arteriosclerosis hyaline intimal layer, producing varying degrees of glomerulosclerosis.[2,12]

Another important aspect to elucidate the pathophysiology of DN is the role played by hyperglycemia. It is responsible for renal hyperfiltration, therefore increases glomerular capillary pressure and promotes cell proliferation regulated by the release of growth factor which, mediating both hypertrophy and cell division as renal fibrosis process by stimulating the production collagen and fibronectin. The glycosylated products resulting from binding of glucose to proteins in the kidney also contributes to renal injury by stimulating fibrosis promoting factors. The severity of these lesions is correlated with the glomerular filtration rate, the degree of albuminuria, duration of diabetes, the degree of glycemic control and genetic factors. Because of the poor prognosis in advanced stages of diabetic nephropathy, the ideal is to identify early renal involvement.[2,12]

Prevention and treatment of DN is based on a multifactorial intervention, which involves the control of risk factors such as hypertension, hyperglycemia, dyslipidemia, smoking, use of nephron-protectors agents, modification of lifestyle, diet, exercise, which not only contribute to reducing the progression of renal disease as modulate the risk of cardiovascular morbidity and mortality.[12]

Although the patients with TCKD by DN are undergoing dialysis treatment in this study, we must highlight the imperative of glycemic control. Given that, it has a strong impact on the prevention and reduction of risk for cardiovascular events, reducing morbidity and mortality and improving the quality of life in patients. Thus, it is very important that diabetic patients on hemodialysis have control of blood glucose levels and blood pressure, maintaining a low protein diet and practicing exercise. These actions, combined with changes in lifestyle, provide a better quality of life and assist in preventing other complications. Therefore, it is necessary the commitment of each member of the multidisciplinary team, aiming to provide to this population decreased risk for other diabetes complications.[1,12]

The third cause of TCKD in the study was chronic glomerulonephritis. This nephropathy is characterized by progressive destruction of the kidneys over a period or decades, producing decreased renal function. In many cases the cause is unknown, but the disease can arise after some years of acute glomerulonephritis or nephrotic syndrome. It is noteworthy that some patients may remain asymptomatic for many years. However, proteinuria and abnormal urinary sediment may be indicative of the disease.[2]

Regarding the implantation of CDTL, 70% were located in the right internal jugular vein. It should be noted that hemodialysis is a substitutive renal treatment modality that requires a long-term vascular access. However, for specific reasons, such as lack of or VAF maturation; immediate start of therapy; it is necessary a large vein conduit in the body.[13,14]

In the United States more than 200,000 people require hemodialysis and 30% do so through a catheter. It is estimated that 250,000 catheters are implanted per year. It is recommended that the CDTL should be employed for a maximum of three or four weeks because it is associated with infectious complications.[13,14]

On the technical aspects, the CDTL are semi-rigid, polyurethane, having size of 15 to 25 cm. When used in the femoral vein, they should have 20 to 24 cm to avoid recirculation and low flow problems. The device inserted in the right internal jugular vein should be 15cm, used to left internal jugular vein 20 cm, as well as implanted in the subclavian vein. The diameter of the catheter is between 11 to 14 French.[13]

Regarding the location of the implant, the literature recommends the following order of priority veins, internal jugular vein, subclavian vein, femoral vein, on both sides. Exceptionally, the vena cava is used less, saphenous vein and the aorta by trans-lumbar puncture. Thus, the internal jugular vein is the site chosen more for having less risk of complication and easy access. The second election is subject to controversy and should be set according to the anatomical and functional characteristics of the patient.[13,14]

In the study, 20% of the implants were located in the subclavian vein. It is noteworthy that this vein should only be used when exhausted all other options, because its use is directly related to vascular stenosis in subclavian branch, which can cause elevation of retrograde venous pressure, followed by severe edema, preventing the manufacture or maintaining the VAF.[13-4]

About the cause removal of CDTL in this study, 70% were associated with the maturation of the VAF. It is known that after preparation of the VAF, its use should be delayed for a minimum period of four weeks, so that there is proper healing and adaptation of the venous vascular bed to blood flowing through blood receiving. About the cause removal of infectious nature (20%), it can be said that the catheter infection is the most common complication. It is worth noting that the incidence of bacteremia varies, being higher in patients who use CDTL, about 4 to 6 for every 1,000 catheters/day.[13]

As regards the effect of the site infection, it is known that it is more frequent in the femoral vein, internal jugular vein followed by the lower incidence and has the implants into the subclavian vein. The CDTL cases of infection are associated with increased risk for complications following, namely: osteomyelitis, endocarditis and death.[13]

The pathogenesis of infection associated with CTDL can be observed, arising from infection of the exit point, followed by the microorganism migration to the outer surface of the catheter lumen infection and colonization and hematogenous infection. The clinical data show that patients are unspecific and they have low sensitivity. In patients using CTDL, presenting signs and symptoms of infection (fever, malaise, chills, back pain or exudate exit site), unfocused another noticeable, being necessary to consider the picture arising from infection to CDTL presence of the patient.[13,14]

The most common clinical finding is fever, which has a high sensitivity, but with low specificity. Moreover, the presence of inflammation, purulent exudate around the implant site, is more specificity.[1,2,13,14]

Once the suspected infection related to CTDL, the realization of the blood cultures must be undertaken to evaluate accurately whether or not associated with bacteremia. This assessment is made by quantitative analysis (number of colonies 5 times higher) and qualitative (differential time of greater growth than 120 minutes). The qualitative and quantitative difference indicates the presence of infection. Quantitative methods have 100% specificity and sensitivity greater than 90%.[13]

On the dialysis dose, Kt/V was found to be 1.1 to 1.2, with the blood above 250 ml/min. The dialysis dose is one of the markers quality of treatment. Therefore, it is essential to know the actual dialysis dose being offered to the patients in each session. The recommended minimum values for three sessions per week should be a Kt/V greater than 1.2. Thus, compared to the results obtained Kt/V values are within the recommended average, using the Daugirdas formula.[2,15-18]

Study conducted in Spain showed that the correlation between Kt/V of Daugirdas to the Kt/V of other formulas is different. The result obtained by Kt/V of Daugirdas has overestimated value when compared to Lowrie formula. Thus, the authors brought the information of a criterion proposed by the K/DOQI, 1997, in what it is considered an adequate dialysis, showing the value of Kt/V Daugirdas less than 1.2 or Kt/V obtained by the Lowrie formula less than 1.0.[2,15-18]

## CONCLUSION

The epidemiological profile of patients undergoing hemodialysis using CTDL was males

aged 20 to 59 years old, married and Catholic Christians. Regarding the level of education, the majority consisted of people who had elementary education or were illiterate. On the etiology of chronic TCKD, the predominant was hypertensive nephropathy, followed by diabetic nephropathy and chronic glomerulonephritis.

In spite of the technical aspects of the CDTL, these were installed on the right side, mostly in the internal jugular vein, followed by the subclavian vein and, finally, the femoral vein. The causes related to their removal were in descending order, namely maturation of arteriovenous fistula; infection and coagulation. The dialysis dose Kt/V ranged from 1.1 to 1.2, with blood flow higher than 250 ml/min.

It is the multidisciplinary health team develops strategies that aim to reduce the risk of potential complications from the use of this device, and by delineating the epidemiological profile and the technical aspects required for successful implantation in the patients. Thus, their intervention can contribute to the reduction of morbidity and mortality and promote the improvement of the quality of life-related to the health of patients (HRQOL).

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